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ENCYCLOPÆDIA BRITANNICA.

C H I

China.
1
Boundaries,
extent, &c.

2
Division in
to provin-
ces.

3
Chinese
pretensions
to antiqui-
ty.

4
Why their
history is
so uncer-
tain.

CHINA, a country of Asia, situated on the most easterly part of that continent. It is bounded on the north by Tartary; from which it is divided, partly by a prodigious wall of 1500 miles in length, and partly by high, craggy, and inaccessible mountains. On the east, it is bounded by the ocean; on the west, by part of the Mogul's empire, and India beyond the Ganges, from which it is parted by other ridges of high mountains and sandy deserts; on the south, it is bounded partly by the kingdoms of Lao, Tonquin, Ava, and Cochinchina, and partly by the southern or Indian sea, which flows between it and the Philippine islands. There are several ways of computing its length and breadth. According to some of these, it is reckoned 1269, 1600, or 1800 miles in length, and as much in breadth: however, by the best and latest accounts, this vast country is somewhat of an oval form, the breadth being less than the length by little more than a fourth part. It contains 15 provinces, exclusive of that of Lyau-tong, which is situated without the great wall, though under the same dominion. Their names are, 1. Shen-si, 2. Shan-si, 3. Pecheli, which are situated on the north side, along the wall; 4. Shantung, 5. Kyan-nang, 6. Che-kyang, 7. Fo-kyen, which are situated along the eastern ocean; 8. Quang-tong, 9. Quang-si, 10. Yu-nan, 11. Se-chuen, which stretch themselves towards the south and south-west; and, 12. Honan, 13. Hu-quand, 14. Quey-chew, 15. Kyang-si; which take up the middle part. For a particular description of all these, see their proper articles.

The origin of all nations is involved in obscurity and fable: but that of the Chinese much more so than any other. Every nation is inclined to assume too high an antiquity to itself, but the Chinese carry theirs beyond all bounds. Indeed, though no people on earth are more exact in keeping records of every memorable transaction, yet such is the genius of the Chinese for superstition and fable, that the first part of their history is deservedly contemned by every rational person. What contributes more to the uncertainty of the Chinese history is, that neither we, nor they themselves, have any thing but fragments of their ancient historical books; for about 213 years before Christ, the reigning emperor Si-whang-ti caused all the books in the empire to be burned, except those written by lawyers and physicians. Nay, the more effectually to destroy the memory of every thing con-

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C H I

tained in them, he commanded a great number of learned men to be buried alive, lest, from their memories, they should commit to writing something of the true memoirs of the empire. The inaccuracy of the Chinese annals is complained of even by their most respected author Confucius himself; who also affirms, that before his time many of the oldest materials for writing such annals had been destroyed.

According to the Chinese histories, the first monarch of the whole universe (that is, of China), was called *Puon-ku*, or *Puen-cu*. This, according to some, was the first man; but according to Bayer and Menzelius, two of the greatest critics in Chinese literature that have hitherto appeared, the word signifies *the highest antiquity*. *Puon-ku* was succeeded by *Tiene-hoang*, which signifies *the emperor of heaven*. They call him also the intelligent heaven, the supreme king of the middle heaven, &c. According to some of their historians, he was the inventor of letters, and of the cyclic characters by which they determine the place of the year, &c. *Tiene-hoang* was succeeded by *Ti hoang* (the emperor of the earth), who divided the day and night, appointing 30 days to make one moon, and fixed the winter solstice to the 11th moon. *Ti hoang* was succeeded by *Gine-hoang* (sovereign of men), who with his nine brothers shared the government among them. They built cities, and surrounded them with walls; made a distinction between the sovereign and subjects; instituted marriage, &c.

The reigns of these four emperors make up one of what the Chinese called *ki*, "ages," or "periods," of which there were nine before *Fo-hi*, whom their most sensible people acknowledge as the founder of their empire.

The history of the second *ki* contradicts almost every thing said of the first; for though we have but just now been told that *Gine-hoang* and his brethren built cities surrounded with walls; yet, in the succeeding age, the people dwelt in caves, or perched upon trees as it were in nests. Of the third *ki* we hear nothing; and in the fourth, it seems matters had been still worse, as we are told that men were then only taught to retire into the hollows of rocks. Of the fifth and sixth we have no accounts. These six periods, according to some writers, contained 90,000 years; according to others, 1,100,750.

In the seventh and eighth *ki*, they tell us over again what they had said of the first; namely, that men be-

A

gan

China.
5
Fabulous
history of
China.

China. gan to leave their caves and dwell in houses, and were taught to prepare clothes, &c. Tchine-fang, the first monarch of the eighth *ki*, taught his subjects to take off the hair from skins with rollers of wood, and cover themselves with the skins so prepared. He taught them also to make a kind of web of their hair, to serve as a covering to their heads against rain. They obeyed his orders with joy, and he called his subjects *people clothed with skins*. His reign lasted 350 years; that of one of his successors, also, named Yeou-tfao-chi, lasted more than 300; and his family continued for 12 or 18,000 years. But what is very surprising, all these thousands and millions of years had elapsed without mankind's having any knowledge of fire. This was not discovered till towards the close of this period, by one Souigine. After so useful a discovery, he taught the people to dress their viſtuals; whereas before they had devoured the flesh of animals quite raw, drunk their blood, and swallowed even their hair and feathers. He is also said to have been the inventor of fishing, letters, &c.

6
Fabulous
history ex-
plained.

In the ninth period we find the invention, or at least the origin of letters, attributed to one Tſang-hie, who received them from a divine tortoise that carried them on his shell, and delivered them into the hands of Tſang-hie. During this period also, music, money, carriages, merchandise, commerce, &c. were invented. There are various calculations of the length of these *ki* or periods. Some make the time from Puan-ku to Confucius, who flourished about 479 years before Christ, to contain 279,000 years; others, 2,276,000; some, 2,759,860 years; others, 3,276,000; and some no less than 96,961,740 years.

These extravagant accounts are by some thought to contain obscure and imperfect hints concerning the cosmogony and creation of the world, &c. Puon-ku, the first emperor, they think, represents eternity preceding the duration of the world. The succeeding ones, Tiene-hoang, Ti-hoang, and Gine-hoang, they imagine signify the creation of the heavens and earth, and the formation of man. The ten *ki* or ages, nine of which preceded Fo-hi, mean the ten generations preceding Noah. This may very possibly be the case; for about 300 years before Christ, some Jews travelled into China, who might have made the Mosaic writings known there.

7
Reign of
Fo-hi.

What we have now related, contains the substance of that part of the Chinese history which is entirely fabulous. After the nine *ki* or "ages" already taken notice of, the tenth commenced with Fo-hi; and the history, though still very dark, obscure, and fabulous, begins to grow somewhat more consistent and intelligible. Fo-hi was born in the province of Shenſi. His mother walking upon the bank of a lake in that province, saw a very large print of a man's foot in the sand there; and, being surrounded by an iris or rainbow, became impregnated. The child was named *Fo-hi*; and, when he grew up, was by his countrymen elected king, on account of his superior merit, and styled *Tyent-ise*, that is "the son of heaven." He invented the eight *qua*, or symbols, consisting of three lines each, which, differently combined, formed 64 characters that were made use of to express every thing. To give these the greater credit, he pretended that

China. he had seen them inscribed on the back of a dragon-horse (an animal shaped like a horse, with the wings and scales of a dragon), which arose from the bottom of a lake. Having gained great reputation among his countrymen by this prodigy, he is said to have created mandarins or officers, under the name of *dragons*. Hence we may assign a reason why the emperors of China always carry a dragon in their banners. He also instituted marriage, invented music, &c. Having established a prime minister, he divided the government of his dominions among four mandarins, and died after a reign of 115 years.

After Fo-hi followed a succession of emperors, of whom nothing remarkable is recorded, except that in the reign of *Yau*, the seventh after Fo-hi, the sun did not set for ten days, so that the Chinese were afraid of a general conflagration. This event the compilers of the Universal History take to be the same with that mentioned in the book of Joshua, when the sun and moon stood still for about the space of a day. Fo-hi they will have to be the same with Noah. They imagine, that after the deluge this patriarch remained some time with his descendants; but on their wicked combination to build the tower of Babel, he separated himself from them with as many as he could persuade to go along with him; and that, still travelling eastward, he at last entered the fertile country of China, and laid the foundation of that vast empire.—But, leaving these fabulous and conjectural times, we shall proceed to give some account of that part of the Chinese history which may be more certainly depended on.

As the Chinese, contrary to the practice of almost all nations, have never fought to conquer other countries, but rather to improve and content themselves with their own, their history for many ages furnishes nothing remarkable. The whole of their emperors, abstracting from those who are said to have reigned in the fabulous times, are comprehended in 22 dynasties, mentioned in the following table.

	Emperors.	Before Christ.
1. <i>Hya</i> , containing	17	2207
2. <i>Shang</i> , or <i>Ing</i> ,	28	1766
3. <i>Chew</i> ,	35	1122
4. <i>Tſin</i> ,	4	248
5. <i>Han</i> ,	25	206
		After Christ.
6. <i>Hew-han</i> ,	2	220
7. <i>Tſin</i> ,	15	465
8. <i>Song</i> ,	8	220
9. <i>Tſi</i> ,	5	479
10. <i>Lyang</i> ,	4	502
11. <i>Chin</i> ,	4	557
12. <i>Sui</i> ,	3	
13. <i>Twang</i> ,	20	618
14. <i>Hew-lyang</i> ,	2	907
15. <i>Hew-tang</i> ,	4	923
16. <i>Hew-tſin</i> ,	2	936
17. <i>Hew-han</i> ,	2	947
18. <i>Hew-cheu</i> ,	3	951
19. <i>Song</i> ,	18	960
20. <i>Iwen</i> ,	9	1280
21. <i>Ming</i> ,	16	1368
22. <i>Tſang</i> ,		1645

This

China.

This table is formed according to the accounts of the Jesuit Du Halde, and is commonly reckoned to be the most authentic; but according to the above-mentioned hypothesis of the compilers of the Universal History, who make *Yau* cotemporary with Joshua, the dynasty of *Hya* did not commence till the year before Christ 1357; and to accommodate the history to their hypothesis, great alterations must be made in the duration of the dynasties.

10
Incurfions
of the Tar-
tars.

The most interesting particulars of the Chinese history relate only to the incurfions of the Tartars, who at last conquered the whole empire, and who still continue to hold the sovereignty; though by transferring the feat of the empire to Peking, and adopting the Chinese language, manners, &c. Tartary would seem rather to have been conquered by China, than China by Tartary. These incurfions are said to have begun very early; even in the time of the emperor Shun, fucceffor to *Yau* above mentioned, in whose reign the miraculous solstice happened. At this time, the Tartars were repulfed, and obliged to retire into their own territories. From time to time, however, they continued to threaten the empire with invafions, and the northern provinces were often actually ravaged by the Tartars in the neighbourhood. About the year before Christ 213, *Shi-whang-ti*, having fully fubdued all the princes, or kings as they were called, of the different provinces, became emperor of China with unlimited power. He divided the whole empire into 36 provinces; and finding the northern part of his dominions much incommoded by the invafions of the neighbouring barbarians, he sent a formidable army againft them, which drove them far beyond the boundaries of China. To prevent their return, he built the famous wall already mentioned, which feparates China from Tartary. After this, being elated with his own exploits, he formed a design of making posterity believe that he himself had been the first Chinese emperor that ever fat on the throne. For this purpose, he ordered all the historical writings to be burnt, and caufed many of the learned to be put to death, as already mentioned.

11
Great wall
built.

What effect the great wall for some time had in preventing the invafions of the Tartars, we are not told; but in the tenth century of the Christian era, thofe of Kitan or *Lyau* got a footing in China. The Kitan were a people of eastern Tartary, who dwelt to the north and north-eaft of the province of *Pecheli* in China, particularly in that of *Lyau-tong* lying without the great wall. These people having fubdued the country between *Korea* and *Kafhgar*, became much more troublefome to the Chinese than all the other Tartars. Their empire commenced about the year 916, in the fourth year of *Mo-ti-kyan-ti*, fecond emperor of the 14th Chinese dynasty called *Hew-lyang*. In 946, *Mingt-fong*, fecond emperor of the 15th dynasty, being dead, *Sheking-tang* his fon-in-law rebelled againft *Mingt-fong*, his fon and fucceffor, whom he deprived of his crown and life. This he accomplished by means of an army of 50,000 men furnifhed by the Kitan. *Fi ti*, the fon of *Mingt-fong*, being unable to refift the ufurper, fled to the city *Ghey-chew*; where fhutting himfelf up with his family and all his valuable effects, he fet fire to the palace, and was burnt to afhes. On his death, *Sheking-tang* affumed the title

12
Kitan Tar-
tars fettle
in China.

of emperor; founded the 16th dynasty; and changed his name to that of *Kaut-fu*. But the Kitan general refufing to acknowledge him, he was obliged to purchafe a peace by yielding up to the Tartars 16 cities in the province of *Pecheli*, befides a yearly prefent of 300,000 pieces of filk.

China

This fubmiffion ferved only to inflame the avarice and ambition of the Kitan. In 959, they broke the treaty when leaft expected, and invaded the empire afresh. *Tfi-vang*, the emperor at that time, oppofed them with a formidable army; but through the treachery of his general *Lyew-chi-ywen*, the Tartars were allowed to take him prifoner. On this, *Tfi-vang* was glad to recover his liberty, by accepting of a fmall principality; while the traitor became emperor of all China, and, changing his name to *Kaut-fu*, founded the 17th dynasty. The Tartars, in the mean time, ravaged all the northern provinces without oppofition, and then marched into the fouthern. But being here ftopped by fome bodies of Chinese troops, the general thought proper to retire with his booty into Tartary. In 962, *Kaut-fu* dying, was fucceeded by his fon *In-ti*. The youth of this prince gave an opportunity to the eunuchs to raife commotions; efpecially as the army was employed at a diftance in repelling the invafions of the Tartars. This army was commanded by *Ko-ghey*, who defeated the enemy in feveral battles, and thus reftored peace to the northern provinces. In the mean time, *In-ti* was flain by his eunuchs, and the empress placed his brother on the throne: but *Ko-ghey*, returning in triumph, was faluted emperor by his victorious army; and the empress being unable to fupport the rights of her fon, was obliged to fubmit, while *Ko-ghey*, affuming the name of *Tay-tfu*, founded the 18th dynasty. Nine years after this, however, the grandees of the empire, fetting afide *Kong-ti*, the third in fucceffion from *Tay-tfu*, on account of his non-age, proclaimed his guardian, named *Chau-quang-yu*, emperor; who, affuming the name of *Kau-tfu*, founded the 19th dynasty, called *Song* or *Tfong*.

Under this monarch the empire began to recover itfelf; but the Kitan ftill continued their incurfions. The fucceffors of *Kau-tfu* oppofed them with various fuccefs; but at laft, in 978, the barbarians became fo ftrong as to lay fiege to a confiderable city. *Tay-tfong*, fucceffor to *Kau-tfu*, detached 300 foldiers, each carrying a light in his hand, againft them in the night time, with orders to approach as near as poffible to the Tartar camp. The barbarians, imagining, by the number of lights, that the whole Chinese army was at hand, immediately fled, and, falling into the ambufcades laid for them by the Chinese general, were almoft all cut to pieces.

This check, however, did not long put a ftop to the ravages of the Kitan. In the year 999, they laid fiege to a city in the province of *Peche-li*; but *Ching-tfong*, fucceffor to *Tay-tfong*, came upon them with his army fo fuddenly, that they betook themfelves to flight. The emperor was advifed to take advantage of their confternation, and recover the country which had been yielded to them; but inftead of purfuing his victory, he bought a peace by confenting to pay annually 100,000 tael (about 34,000l.), and 200,000 pieces of filk. The youth and pacific difpofition of

A 2

Jin-tfong,

^{China.} Jin-tsong, successor to Ching-tsong, revived the courage of the Kitan; and, in 1035, war would have been renewed, had not the emperor condescended to as shameful a treaty as that concluded by his father. Two years after, the Tartars demanded restitution of ten cities in the province of Peche-li, which had been taken by Ko-ghey founder of the 18th dynasty; upon which Jin-tsong engaged to pay them an annual tribute of 200,000 taels of silver, and 300,000 pieces of silk, in lieu of these cities.

¹³
Kitan driven out by the eastern Tartars;

From this time the Kitan remained in peaceable possession of their Chinese dominions till the year 1117. Whey-tsong, at that time emperor, being able neither to bear their ravages, nor by himself to put a stop to them, resolved upon a remedy which at last proved worse than the disease. This was to call in the Nu-che, Nyu-che, or Eastern Tartars, to destroy the kingdom of the Kitan. From this he was dissuaded by the king of Korea, and most of his own ministers; but, disregarding their salutary advice, he joined his forces to those of the Nu-che. The Kitan were then everywhere defeated; and at last reduced to such extremity, that those who remained were forced to leave their country, and fly to the mountains of the west.

¹⁴
Who assume the name of *Kin*, and invade China.

Thus the empire of the Kitan was totally destroyed, but nothing to the advantage of the Chinese; for the Tartar general, elated with his conquest, gave the name of *Kin* to his new dominion, assumed the title of emperor, and began to think of aggrandizing himself and enlarging his empire. For this purpose, he immediately broke the treaties concluded with the Chinese emperor; and, invading the provinces of Pecheli and Shenfi, made himself master of the greater part of them. Whey-tsong, finding himself in danger of losing his dominions, made several advantageous proposals to the Tartar; who, seeming to comply with them, invited him to come and settle matters by a personal conference. The Chinese monarch complied; but, on his return, the terms agreed on seemed intolerable to his ministers; so that they told him the treaty could not subsist, and that the most cruel war was preferable to such an ignominious peace. The Kin monarch, being informed of all that passed, had recourse to arms, and took several cities. Whey-tsong was weak enough to go in person to hold a second conference; but, on his arrival, was immediately seized by the Tartar. He was kept prisoner under a strong guard during the remaining part of his life; and ended his days in 1126, in the desert of Shamo, having nominated his eldest son Kin-tsong to succeed him.

¹⁵
They take the emperor prisoner.

¹⁶
Imperial city and another emperor taken.

Kin-tsong began his reign with putting to death six ministers of state, who had betrayed his father into the hands of the Kin Tartars. The barbarians in the mean time pursued their conquests without opposition. They crossed the Whang-ho, or Yellow river, which a handful of troops might have prevented; and marching directly towards the imperial city, took and plundered it. Then seizing the emperor and his consort, they carried them away captives: but many of the principal lords, and several of the ministers, preferring death to such an ignominious bondage, killed themselves. The Kin being informed by the empress

^{China.} *Meng* that she had been divorced, they left her behind. This proved the means of saving the empire; for by her wisdom and prudence she got the crown placed on the head of Kau-tsong, ninth son of the emperor Whey-tsong by his divorced empress.

Kau-tsong fixed his court at Nanking the capital of Kyang-nan; but soon after was obliged to remove it to Kang-chew in Che-kyang. He made several efforts to recover some of his provinces from the Kin, but without effect. Ili-tsong the Kin monarch, in the mean time, endeavoured to gain the esteem of his Chinese subjects by paying a regard to their learning and learned men, and honouring the memory of Confucius. Some time after, he advanced to Nanking, from whence Kau-tsong had retired, and took it: but, receiving advice that Yo-fi, general of the Song, or southern Chinese, was advancing by long marches to the relief of that city, they set fire to the palace, and retired northward. However, Yo-fi arrived time enough to fall upon their rear-guard, which suffered the Kin very much; and from this time the Kin never dared to cross the river Kyang. In a few years afterwards the Chinese emperor submitted to become tributary to the Kin, and concluded a peace with them upon very dishonourable terms. This submission, however, was of little avail: for, in 1163, the Tartars broke the peace, and, invading the southern province with a formidable army, took the city of Yang-chew. The king, having approached the river Kyang, near its mouth, where it is widest as well as most rapid, commanded his troops to cross it, threatening with his drawn sword to kill those who refused. On receiving such an unreasonable command, the whole army mutinied; and the king being killed in the beginning of the tumult, the army immediately retired.

¹⁷
Progress of the Kin checked.

From this time to the year 1210, nothing remarkable occurs in the Chinese history; but this year, Jenghiz-khan, chief of the western Tartars, *Moguls* or *Mungls*, quarrelled with Yong-tsi emperor of the Kin; and at the same time the king of Hya, disgusted at being refused assistance against Jenghiz-khan, threatened him with an invasion on the west side. Yong-tsi prepared for his defence; but in 1211, receiving news that Jenghiz-khan was advancing southward with his whole army, he was seized with fear, and made proposals of peace, which were rejected. In 1212, the Mogul generals forced the great wall; or, according to some writers, had one of the gates treacherously opened to them, to the north of Shanfi; and made incursions as far as Peking, the capital of the Kin empire. At the same time the province of Lyau-tong was almost totally reduced by several Kitan lords who had joined Jenghiz-khan; several strong places were taken, and an army of 300,000 Kin defeated by the Moguls. In autumn they laid siege to the city of Tay-tong-fu; where, although the governor Hujaku fled, yet Jenghiz-khan met with considerable resistance. Having lost a vast number of men, and being himself wounded by an arrow, he was obliged to raise the siege and retire into Tartary; after which the Kin retook several cities. The next year, however, Jenghiz-khan re-entered China; retook the cities which the Kin had reduced the year before; and overthrew

¹⁸
They are attacked by Jenghiz-khan and the king of Hya.

¹⁹
Great wall forced by Jenghiz-khan.

their

China. their armies in two bloody battles, in one of which the ground was strewed with dead bodies for upwards of four leagues.

The same year Yong-tsi was slain by his general Hujaku : and Sun, a prince of the blood, advanced in his room. After this the Moguls, attacking the empire with four armies at once, laid waste the provinces of Shan-si, Honan, Pecheli, and Shantung. In 1214 Jenghiz-khan sat down before Peking ; but instead of assaulting the city, offered terms of peace, which were accepted, and the Moguls retired into Tartary. After their departure, the emperor, leaving his son at Peking, removed his court to Pyen-lyang near Kay-song-fu, the capital of Honan. At this Jenghiz-khan being offended, immediately sent troops to besiege Peking. The city held out to the fifth month of the year 1215, and then surrendered. At the same time the Moguls finished the conquest of Lyau-tong ; and the Song refused to pay the usual tribute to the Kin.

20
Peking taken.

21
Southern Chinese declared war against the Kin.

In 1216, Jenghiz-khan returned to pursue his conquest in the west of Asia, where he staid seven years ; during which time his general Muhuli made great progress in China against the Kin emperor. He was greatly assisted by the motions of Ning-tsong emperor of the Song, or southern China ; who, incensed by the frequent perfidies of the Kin, had declared war against them, and would hearken to no terms of peace, though very advantageous proposals were made. Notwithstanding this, however, in 1220, the Kin, exerting themselves, raised two great armies, one in Shen-si, and the other in Shan-tong. The former baffled the attempts of the Song and king of Hya, who had united against them ; but the latter, though no fewer than 200,000, were entirely defeated by Muhuli. In 1221, that officer passed the Whang-ho, and died after conquering several cities.

22
Jenghiz-khan destroys the kingdom of Hya ;

23
And dies.

In 1224, the Kin emperor died ; and was succeeded by his son Shew, who made peace with the king of Hya ; but next year, that kingdom was entirely destroyed by Jenghiz-khan. In 1226, Oktay, son to Jenghiz-khan, marched into Honan, and besieged Kay-song-fu, capital of the Kin empire, but was obliged to withdraw into Shen-si, where he took several cities, and cut in pieces an army of 30,000 men. In 1227 Jenghiz khan died, after having desired his sons to demand a passage for their army through the dominions of the Song, without which he said they could not easily vanquish the Kin.

After the death of that great conqueror, the war was carried on with various success ; but though the Moguls took above 60 important posts in the province of Shen-si, they found it impossible to force Ton-quan, which it behoved them to do in order to penetrate effectually into Honan. In April 1231 they took the capital of Shen-si, and defeated the Kin army which came to its relief. Here one of the officers desired Prince Toley to demand a passage from the Song through the country of Han-chong-fu. This proposal Toley communicated to his brother Oktay, who approved of it as being conformable to the dying advice of Jenghiz-khan. Hereupon Toley, having assembled all his forces, sent a messenger to the Song generals to demand a passage through their territories. This, however, they not only refused, but put the messenger to death ; which so enraged Toley that he swore to

24
Moguls quarrel with the Song.

make them repent of it, and was soon as good as his word. He decamped in August 1231 ; and having forced the passes, put to the sword the inhabitants of Wha-yang and Fong-chew, two cities in the district of Hang-chong-fu. Then having cut down rocks to fill up deep abysses, and made roads through places almost inaccessible, he came and besieged the city of Han-chong-fu itself. The miserable inhabitants fled to the mountains on his approach, and more than 100,000 of them perished. After this, Toley divided his forces, consisting of 30,000 horse, into two bodies. One of these went westward to Myen-chew : from thence, after opening the passages of the mountains, they arrived at the river Kyaling, which runs into the great Kyang. This they crossed on rafts made of the wood of demolished houses ; and then, marching along its banks, seized many important posts. At last, having destroyed more than 140 cities, towns, or fortresses, they returned to the army. The second detachment seized an important post in the mountains, called *Tautong*, six or seven leagues to the eastward of Hang-chong-fu. On the other side Oktay advanced, in October, towards Pu-chew a city of Shan-si ; which being taken after a vigorous defence, he prepared to pass the Whang-ho. Toley, after surmounting incredible difficulties, arrived in December on the borders of Honan, and made a show as if he designed to attack the capital of the Kin empire. On his first appearance in Honan through a passage so little suspected, every body was filled with terror and astonishment, so that he proceeded for some time without opposition. At last the emperor ordered his generals, Hota, Ilapua, and others, to march against the enemy. Toley boldly attacked them ; but was obliged to retire, which he did in good order. Hota was for pursuing him, saying that the Mogul army did not exceed 30,000 men, and that they seemed not to have eaten any thing for two or three days. Ilapua, however, was of opinion that there was no occasion for being so hasty, as the Moguls were inclosed between the rivers Han and Whang-ho, so that they could not escape. This negligence they soon had occasion to repent of : for Toley, by a stratagem, made himself master of their heavy baggage ; which accident obliged them to retire to Tang-chew. From thence they sent a messenger to acquaint the emperor that they had gained the battle, but concealed the loss of their baggage. This good news filled the court with joy ; and the people who had retired into the capital for its defence, left it again, and went into the country : but, in a few days after, the vanguard of the Moguls, who had been sent by the emperor Oktay, appeared in the field, and carried off a great number of those that had quitted the city.

In January 1232, Oktay passing the Whang-ho, encamped in the district of Kay-song-fu, capital of the Kin empire, and sent his general Suptay to besiege the city. At that time the place was near 30 miles in circumference : but having only 40,000 soldiers to defend it, as many more from the neighbouring cities, and 20,000 peasants, were ordered into it ; while the emperor published an affecting declaration, animating the people to defend it to the last extremity. Oktay, having heard with joy of Toley's entrance into Honan, ordered him to send succours to Suptay. On

China.
25
Exploits of Toley.

26
Capital of the Kin empire besieged.

the

China.

the other hand, the Kin generals advanced with 150,000 men to relieve the city; but being obliged to divide their forces in order to avoid in part the great road which Toley had obstructed with trees, they were attacked by that prince at a disadvantage, and, after a faint resistance, defeated with great slaughter, and the loss of both their generals, one killed and the other taken. The emperor now ordered the army at Tong-quan and other fortified places to march to the relief of Kay-fong-fu. They assembled accordingly, to the number of 110,000 foot and 15,000 horse; and were followed by vast numbers of people, who expected by their means to be protected from the enemy. But many of these troops having deserted, and the rest being enfeebled by the fatigues of their march, they dispersed on the approach of their pursuers, who killed all they found in the highways. After this the Moguls took Tong-quan and some other considerable posts; but were obliged to raise the sieges of Quey-te-fu and Loyang by the bravery of the governors. Kyang-shin, governor of Loyang, had only 3 or 4000 soldiers under him, while his enemies were 30,000 strong. He placed his worst soldiers on the walls, putting himself at the head of 400 brave men; whom he ordered to go naked, and whom he led to all dangerous attacks. He invented engines to cast large stones, which required but few hands to play them, and aimed so true as to hit at 100 paces distance. When their arrows failed, he cut those shot by the enemy into four pieces; pointed them with pieces of brass coin; and discharged them from wooden tubes with as much force as bullets are from a musket. Thus he harassed the Moguls for three months so grievously, that they were obliged, notwithstanding their numbers, to abandon the enterprise.

27
Bravery of
the besieged.

Oktay, at last, notwithstanding his successes, resolved to return to Tartary; and offered the Kin emperor peace, provided he became tributary, and delivered up to him 27 families which he named. These offers were very agreeable to the emperor; but Suputay, taking no notice of the treaty, pushed on the siege of the capital with more vigour than ever. By the help of the Chinese slaves in his army, the Mogul general soon filled the ditch; but all his efforts seemed only to inspire the besieged with new vigour. The Moguls at that time made use of artillery, but were unable to make the least impression upon the city walls. They raised walls round those they besieged, which they fortified with ditches, towers, and battlements. They proceeded also to sap the walls of the city; but were very much annoyed by the artillery of the besieged, especially by their bombs, which sinking into the galleries, and bursting under ground, made great havoc among the miners. For 16 days and nights the attacks continued without intermission; during which time an incredible number of men perished on both sides; at length, Suputay, finding that he could not take the city, withdrew his troops, under pretence of conferences being on foot. Soon after the plague began in Kay-fong-fu; and raged with such violence, that, in 50 days, 900,000 biers were carried out, besides a vast multitude of the poorer sort who could not afford any.

28
Peace concluded;

29
And broken.

In a short time, two unlucky accidents occasioned a renewal of the war; which now put an end to the

empire of the Kin. Gan-yong, a young Mogul lord, having assumed the government of some cities in Kyang-nan, and killed the officer sent to take possession of them, declared for the Kin. The emperor unwarily took Gan-yong into his service, and gave him the title of prince. Upon this Oktay sent an envoy, attended by 30 other persons, to inquire into the affair; but the Kin officers killed them all, without being punished by the emperor. Suputay, having informed his master of all these proceedings, was ordered to continue the war in Honan. Shew-fu now commanded his officers to unite their troops for the defence of the capital; but before his orders could be obeyed, they were attacked and defeated, one after another, by the Moguls. This obliged him to raise soldiers from among the peasants, for whose subsistence the people were taxed $\frac{1}{5}$ of the rice they possessed. The city began now to be distressed for want of provisions; and as it was but in a bad posture of defence, the emperor marched with an army against the Moguls. His expedition proved unfortunate; for, sending part of his army to besiege a city called *Why-chew*, it was totally cut in pieces, and Suputay a second time fat down before the capital.

China.

30
Capital again besieged,

31
And taken.

On hearing this bad news, the emperor repassed the Whang-ho, and retired to Quey-te-fu. Here he had not been long before the capital was delivered up by treachery, and Suputay put all the males of the imperial race to death; but, by the express command of Oktay, spared the inhabitants, who are said to have amounted to 1,400,000 families. After this disaster the unhappy monarch left his troops at Quey-te-fu, and retired to Juning-fu, a city in the southern part of Honan, attended only by 400 persons. Here the distance of the Moguls made him think of living at ease; but while he flattered himself with these vain hopes, the enemy's army arrived before the city and invested it. The garrison were terrified at their approach; but were encouraged by the emperor, and his brave general Hu-sye-hu, to hold out to the last. As there were not in the city a sufficient number of men, the women, dressed in men's clothes, were employed to carry wood, stones, and other necessary materials to the walls. All their efforts, however, were ineffectual. They were reduced to such extremities, that for three months they fed on human flesh; killing the old and feeble, as well as many prisoners, for food. This being known to the Moguls, they made a general assault in January 1234. The attack continued from morning till night; but at last the assailants were repulsed. In this action, however, the Kin lost all their best officers; upon which the emperor resigned the crown to Cheng-lin a prince of the blood. Next morning, while the ceremony of investing the new emperor was performing, the enemy mounted the south walls, which were defended only by 200 men; and the south gate being at the same time abandoned, the whole army broke in. They were opposed, however, by Hu-sye-hu; who, with 1000 soldiers, continued to fight with amazing intrepidity. In the mean time Shew-fu, seeing every thing irreparably lost, lodged the seal of the empire in a house; and then causing sheaves of straw to be set round it, ordered it to be set on fire as soon as he was dead. After giving this order he hanged himself, and his commands were executed

32
Siege of Juning-fu.

33
Unhappy fate of the emperor.

China.
34
Dissolution
of the Kin
empire.

cuted by his domestics. Hu-sye-hu, who still continued fighting with great bravery, no sooner heard of the tragical death of the emperor, than he drowned himself in the river Ju; as did also 500 of his most resolute soldiers. The same day the new emperor, Cheng-lin, was slain in a tumult; and thus an end was put to the dominion of the Kin Tartars in China.

35
War between the
Song and the
Moguls.

The empire of China was now to be shared between the Song, or southern Chinese, and the Moguls. It had been agreed upon, that the province of Honan should be delivered up to the Song as soon as the war was finished. But they, without waiting for the expiration of the term, or giving Oktay notice of their proceedings, introduced their troops into Kay-fong-fu, Lo-yang, and other considerable cities. On this the Mogul general resolved to attack them; and repassing the Whang-ho, cut in pieces part of the garrison of Lo-yang, while they were out in search of provisions. The garrison of Kay-fong-fu likewise abandoned that place; and the Song emperor degraded the officers who had been guilty of those irregularities, sending ambassadors to Oktay, at the same time, to desire a continuance of the peace. What Oktay's answer was we are not told, but the event showed that he was not well pleased; for, in 1235, he ordered his second son Prince Kotovan, and his general Chahay, to attack the Song in Se-chwen, while others marched towards the borders of Kyang-nan.

36
Dreadful
engagement.

In 1236, the Moguls made great progress in the province of Huquang, where they took several cities, and put vast numbers to the sword. This year they introduced paper or silk money, which had formerly been used by Chang-tsong, sixth emperor of the Kin. Prince Kotovan forced the passages into the district of Hang-chong-fu in the province of Shen-si, which he entered with an army of 500,000 men. Here a terrible battle was fought between the vast army of the Moguls and the Chinese troops, who had been driven from the passages they defended. The latter consisted only of 10,000 horse and foot, who were almost entirely cut off; and the Moguls lost such a number of men, that the blood is said to have run for two leagues together. After this victory the Moguls entered Se-chwen, which they almost entirely reduced, committing such barbarities, that, in one city, 40,000 people chose rather to put an end to their own lives than submit to such cruel conquerors.

In 1237, the Moguls received a considerable check before the city of Gantong in Kyang-nan, the siege of which they were obliged to raise with loss. In 1238, they besieged Lu-chew, another city in the same province. They surrounded it with a rampart of earth and a double ditch; but the Chinese general ordered their intrenchments to be filled with immense quantities of herbs steeped in oil, and then set on fire, while he shot stones upon them from a tower seven stories high. At the same time a vigorous sally was made; and the Mogul army being thrown into the utmost disorder, were obliged finally to abandon the siege, and retire northwards.

In 1239, these barbarians were opposed by a general called Meng-kong, with great success; who, this and the following year, gained great honour by his exploits. While he lived, the Moguls were never

able to make any considerable progress; but his death, in 1246, proved of the greatest detriment to the Chinese affairs: and soon after, the Tartars renewed the war with more vigour and success than ever. In 1255, they re-entered the province of Se-chwen; but still met with vigorous opposition in this quarter, because the Chinese took care to have Se-chwen furnished with good troops and generals. Though they were always beaten, being greatly inferior in number to their enemies, yet they generally retook the cities the Moguls had reduced, as the latter were commonly obliged to withdraw for want of provisions, and forage. In 1259 they undertook the siege of Ho-chew, a strong city to the west of Peking, defended by Vang-kyen, a very able officer, who commanded a numerous garrison. The siege continued from the month of February till August; during which time the Moguls lost an immense number of men. On the 10th of August they made a general assault in the night. They mounted the walls before the governor had intelligence; but were soon attacked by him with the utmost fury. The Mogul emperor, Meng-ko, himself came to the scalade; but his presence was not sufficient to overcome the valour of Vang-kyen. At the same time the scaling-ladders of the Moguls were blown down by a storm; upon which a terrible slaughter ensued, and amongst the rest fell the emperor himself. Upon this disaster the Mogul generals agreed to raise the siege, and retired towards Shen-fi.

On the death of Meng-ko, Hupilay, or Kublay Khan, who succeeded him, laid siege to Vu-chang-fu, a city not far distant from the capital of the Song empire.

At this the emperor being greatly alarmed, distributed immense sums among his troops; and, having raised a formidable army, marched to the relief of Vu-chang-fu. Unfortunately the command of this army was committed to the care of Kya-tse-tau, a man without either courage or experience in war. He was besides very vain and vindictive in his temper; often using the best officers ill, and entirely overlooking their merit, which caused many of them to go over to the Moguls. The siege of Vu-chang-fu was commenced, and had continued a considerable time, when Kya-tse-tau, afraid of its being lost, and at the same time not daring to take any effectual step for its relief, made proposals of peace. A treaty was accordingly concluded, by which Kya-tse-tau engaged to pay an annual tribute of about 50,000*l.* in silver, and as much in silk; acknowledging likewise the sovereignty of the Moguls over the Song empire. In consequence of this treaty, the Moguls retreated after the boundaries of the two empires had been fixed, and repassed the Kyang; but 170 of them having slain on the other side of the river, were put to death by Kya-tse-tau.

This wicked minister totally concealed from the emperor his having made such a shameful treaty with the Moguls; and the 170 soldiers massacred by his order, gave occasion to a report that the enemy had been defeated; so that the Song court believed that they had been compelled to retreat by the superior valour and wisdom of Kya-tse-tau. This proved the ruin of the empire; for, in 1260, the Mogul emperor sent Hanking to the Chinese court to execute the treaty according to the terms agreed on with Kya-tse-tau.

China.

37
Siege of
Ho-chew.

38
Moguls defeated, and
their emperor killed;

39
Treachery
of a Chinese
minister.

The

China.

The minister, dreading the arrival of this envoy, imprisoned him near Nanking; and took all possible care that neither Hupilay, nor Li-tsong the Chinese emperor, should ever hear any thing of him.

It was impossible such unparalleled conduct could fail to produce a new war. Hupilay's courtiers incessantly pressed him to revenge himself on the Song for their treacherous behaviour; and he soon published a manifesto against them, which was followed by a renewal of hostilities in 1268. The Mogul army amounted to 300,000 men; but notwithstanding their numbers, little progress was made till the year 1271. Syan-yang and Fan-ching, cities in the province of Se-chew, had been besieged for a long time ineffectually; but this year an *Igur* lord advised Hupilay to send for several of those engineers out of the west, who knew how to cast stones of 150 pounds weight out of their engines, which made holes of seven or eight feet wide in the strongest walls. Two of these engineers were accordingly sent for; and after giving a specimen of their art before Hupilay, were sent to the army in 1272. In the beginning of 1273 they planted their engines against the city of Fan-ching, and presently made a breach in the walls. After a bloody conflict the suburbs were taken; and soon after the Moguls made themselves masters of the walls and gates of the city. Nevertheless, a Chinese officer, with only 100 soldiers, resolved to fight from street to street. This he did for a long time with the greatest obstinacy, killing vast numbers of the Moguls; and both parties are said to have been so much overcome with thirst, that they drank human blood to quench it. The Chinese set fire to the houses, that the great beams, falling down, might embarrass the way of their pursuers; but at last being quite wearied out, and filled with despair, they put an end to their own lives. After the taking of Fan-ching, all the materials which had served at the siege were transported to Seyenyang. The two engineers posted themselves against a wooden retrenchment raised on the ramparts. This they quickly demolished; and the besieged were so intimidated by the noise and havoc made by the stones cast from these terrible engines, that they immediately surrendered.

In 1274, Pe-yen, an officer of great valour, and endowed with many other good qualities, was promoted to the command of the Mogul army. His first exploits were the taking of two strong cities; after which he passed the great river Ky-ang, defeated the Song army, and laid siege to Vu-chang-fu. This city was soon intimidated into a surrender; and Pe-yen, by restraining the barbarity of his soldiers, whom he would not allow to hurt any body, soon gained the hearts of the Chinese so much, that several cities surrendered to him on the first summons. In the mean time the treacherous Kya-tse-tau, who was sent to oppose Pe-yen, was not ashamed to propose peace on the terms he had formerly concluded with Hupilay; but these being rejected, he was obliged at length to come to an engagement. In this he was defeated, and Pe-yen continued his conquests with great rapidity. Having taken the city of Nanking, and some others, he marched towards Hang-chew-fu, the capital of the Song empire. Peace was now again proposed, but rejected by the Mogul general; and at last the em-

40
Desperate
conflict.

41
Chinese
empres
submits.

press was constrained to put herself, with her son, then an infant, into the hands of Pe-yen, who immediately sent them to Hupilay.

The submission of the empress did not yet put an end to the war. Many of the chief officers swore to do their utmost to rescue her from the hands of her enemies. In consequence of this resolution they distributed their money among the soldiers, and soon got together an army of 40,000 men. This army attacked the city where the young emperor Kong-tsong was lodged, but without success; after which, and several other vain attempts, they raised one of his brothers to the throne, who then took upon him the name of Twon-tsong. He was but nine years of age when he was raised to the imperial dignity, and enjoyed it but a very short time. In 1277 he was in great danger of perishing, by reason of the ship on board which he then was being cast away. The poor prince fell into the water, and was taken up half dead with the fright. A great part of his troops perished at that time, and he soon after made offers of submission to Hupilay. These, however, were not accepted; for, in 1278, the unhappy Twon-tsong was obliged to retire into a little desert island on the coast of Quang-tong, where he died in the 11th year of his age.

Notwithstanding the progress of the Moguls, vast territories still remained to be subdued before they could become masters of all the Chinese empire. On the death of Twon-tsong, therefore, the mandarins raised to the throne his brother, named Te-ping, at that time but eight years of age. His army consisted of no fewer than 200,000 men; but being utterly void of discipline, and entirely ignorant of the art of war, they were defeated by 20,000 Mogul troops. Nor was the fleet more successful; for being put in confusion by that of the Moguls, and the emperor in danger of falling into their hands, one of the officers taking him on his shoulders, jumped with him into the sea, where they were both drowned. Most of the mandarins followed this example, as did also the empress and minister, all the ladies and maids of honour, and multitudes of others, insomuch that 100,000 people are thought to have perished on that day. Thus ended the Chinese race of emperors; and the Mogul dynasty, known by the name of *Ywen*, commenced.

Though no race of men that ever existed were more remarkable for cruelty and barbarity than the Moguls; yet it doth not appear that the emperors of the Ywen dynasty were in any respect worse than their predecessors. On the contrary, Hupilay, by the Chinese called *Shi-tsu*, found the way of reconciling the people to his government, and even of endearing himself to them so much, that the reign of his family is to this day styled by the Chinese *the wise government*. This he accomplished by keeping as close as possible to their ancient laws and customs, by his mild and just government, and by his regard for their learned men. He was indeed ashamed of the ignorance and barbarity of his Mogul subjects, when compared with the Chinese. The whole knowledge of the former was summed up in their skill in managing their arms and horses, being perfectly destitute of every art or science, or even of the knowledge of letters. In 1269, he had caused the Mogul characters to be con-

China.

42
Dissolution
of the Song
empire.

43
Reign of
Hupilay.

China.

China.

trived. In 1280, he caused some mathematicians search for the source of the river Whang-ho, which at that time was unknown to the Chinese themselves. In four months time they arrived in the country where it rises, and made a map of it, which they presented to his majesty. The same year a treatise on astronomy was published by his order; and, in 1282, he ordered the learned men to repair from all parts of the empire, to examine the state of literature, and take measures for its advancement.

At his first accession to the crown he fixed his residence at Tay-ywen-fu, the capital of Shen-si; but thought proper afterwards to remove it to Peking. Here, being informed that the barks which brought to court the tribute of the southern provinces, or carried on the trade of the empire, were obliged to come by sea, and often suffered shipwreck, he caused that celebrated canal to be made, which is at present one of the wonders of the Chinese empire, being 300 leagues in length. By this canal above 9000 imperial barks transport with ease, and at small expence, the tribute of grain, rice, silk, &c. which is annually paid to the court. In the third year of his reign Shi-tsu formed a design of reducing the islands of Japan, and the kingdoms of Tonquin and Cochinchina. Both these enterprises ended unfortunately, but the first remarkably so; for of 100,000 persons employed in it, only four or five escaped with the melancholy news of the destruction of the rest, who all perished by shipwreck. Shi-tsu reigned 15 years, died in the 80th year of his age, and was succeeded by his grandson. The throne continued in the Ywen family to the year 1367, when Shun-ti, the last of that dynasty, was driven out by a Chinese named Chu. During this period the Tartars had become enervated by long prosperity; and the Chinese had been roused into valour by their subjection. Shun-ti, the reigning prince, was quite sunk in sloth and debauchery; and the empire, besides, was oppressed by a wicked minister named *Ama*. In June 1355, Chu, a Chinese of mean extraction, and head of a small party, set out from How-chew, passed the Kyang, and took Tayping. He then associated himself with some other malcontents, at the head of whom he reduced the town of Tu-chew, in Kyangnan. Soon after he made himself master of Nanking, having defeated the Moguls who came to its relief. In December 1356, he was able to raise 100,000 men, at the head of whom he took the city of U-chew, in the east borders of Quang-si; and here, assembling his generals, it was resolved neither to commit slaughter nor to plunder. The most formidable enemy he had to deal with was *Chen-yew-lyang*, styled "emperor of the Han." This man being grieved at the progress made by Chu, equipped a fleet, and raised a formidable army, in order to reduce Nan-chang-fu, a city of Kyang-si, which his antagonist had made himself master of. The governor, however, found means to inform Chu of his danger; upon which that chief caused a fleet to be fitted out at Nanking, in which he embarked 200,000 soldiers. As soon as *Chen-yew-lyang* was informed of his enemy's approach, he raised the siege of Nan-chang-fu, and gave orders for attacking Chu's naval force. An engagement ensued between a part of the fleets, in which Chu proved victorious; and next day, all the squadrons having

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joined in order to come to a general engagement, Chu gained a second victory, and burnt 100 of the enemy's vessels. A third and fourth engagement happened, in both which Chu gained the victory; and in the last, *Chen-yew-lyang* himself was killed, his son taken prisoner, and his generals obliged to surrender themselves, with all their forces and vessels.

In January 1364, Chu's generals proposed to have him proclaimed emperor; but this he declined, and at first contented himself with the title of king of U. In February he made himself master of Vu-chang-fu, capital of Hu-quang: where, with his usual humanity, he relieved those in distress, encouraged the literati, and would allow his troops neither to plunder nor destroy. This wise conduct procured him an easy conquest both of Kyang-si and Hu-quang. The Chinese submitted to him in crowds, and professed the greatest veneration and respect for his person and government.

All this time Shun-ti, with an unaccountable negligence, never thought of exerting himself against Chu, but continued to employ his forces against the rebels who had taken up arms in various parts of the empire; so that Chu found himself in a condition to assume the title of emperor. This he chose to do at Nanking on the first day of the year 1368. After this his troops entered the province of Honan, which they presently reduced. In the third month, Chu, who had now taken the title of *Hong-vu* or *Tay-tsu*, reduced the fortresses of Tong-quan; after which his troops entered Pecheli from Honan on the one side, and Shan-tong on the other. Here his generals defeated and killed one of Shun-ti's officers; after which they took the city of Tong-chew, and then prepared to attack the capital, from which they were now but 12 miles distant. On their approach the emperor fled with all his family beyond the great wall, and thus put an end to the dynasty of Ywen. In 1370 he died, and was succeeded by his son, whom the successor of *Hong-vu* drove beyond the Kobi or Great Desert, which separates China from Tartary. They continued their incursions, however, for many years; nor did they cease their attempts till 1583, when vast numbers of them were cut in pieces by the Chinese troops.

The 21st dynasty of Chinese emperors, founded in 1368 by Chu, continued till the year 1644, when they were again expelled by the Tartars. The last Chinese emperor was named *Whay-tsung*, and ascended the throne in 1628. He was a great lover of the sciences, and a favourer of the Christians; though much addicted to the superstitions of the Bonzes. He found himself engaged in a war with the Tartars, and a number of rebels in different provinces. That he might more effectually suppress the latter, he resolved to make peace with the former; and for that end sent one of his generals, named *Ywen*, into Tartary, at the head of an army, with full power to negotiate a peace; but that traitor made one upon such shameful terms, that the emperor refused to ratify it. *Ywen*, in order to oblige his master to comply with the terms made by himself, poisoned his best and most faithful general, named *Mau-ven-long*: and then desired the Tartars to march directly to Peking, by a road different from that which he took with his army. This they accordingly did, and laid siege to the capital.

B

Ywen

44
Moguls driven out.45
Exploits of Chu.46
He is proclaimed king of U.47
Becomes emperor of China.48
Moguls driven beyond the desert.49
China again conquered by the Tartars.

China.

Ywen was ordered to come to its relief; but, on his arrival, was put to the torture and strangled; of which the Tartars were no sooner informed, than they raised the siege, and returned to their own country. In 1636, the rebels above mentioned composed four great armies, commanded by as many generals; which, however, were soon reduced to two, commanded by Li and Chang. These agreed to divide the empire between them; Chang taking the western provinces, and Li the eastern ones. The latter seized on part of Shen-si, and then of Honan, whose capital, named *Kay-fong-fu*, he laid siege to, but was repulsed with loss. He renewed it six months after, but without success; the besieged choosing rather to feed on human flesh than surrender. The imperial forces coming soon after to its assistance, the general made no doubt of being able to destroy the rebels at once, by breaking down the banks of the Yellow river; but unfortunately the rebels escaped to the mountains, while the city was quite overflowed, and 300,000 of the inhabitants perished.

After this disaster, Li marched into the provinces of Shen-si and Honan; where he put to death all the mandarins, exacted great sums from the officers in place, and showed no favour to any but the populace, whom he freed from all taxes: by this means he drew so many to his interest, that he thought himself strong enough to assume the title of emperor. He next advanced towards the capital, which, though well garrisoned, was divided into factions. Li had taken care to introduce beforehand a number of his men in disguise: and by these the gates were opened to him the third day after his arrival. He entered the city in triumph at the head of 300,000 men; whilst the emperor kept himself shut up in his palace, busied only with his superstitions. It was not long, however, before he found himself betrayed: and, under the greatest consternation, made an effort to get out of the palace, attended by about 600 of his guards. He was still more surpris'd to see himself treacherously abandoned by them, and deprived of all hopes of escaping the insults of his subjects. Upon this, preferring death to the disgrace of falling alive into their hands, he immediately retired with his empress, whom he tenderly loved, and the princess her daughter, into a private part of the garden. His grief was so great that he was not able to utter a word; but she soon understood his meaning, and, after a few silent embraces, hanged herself on a tree in a silken string. Her husband staid only to write these words on the border of his vest: "I have been basely deserted by my subjects; do what you will with me, but spare my people." He then cut off the young princess's head with one stroke of his scymitar, and hanged himself on another tree, in the 17th year of his reign, and 36th of his age. His prime minister, queens, and eunuchs, followed his example; and thus ended the Chinese monarchy, to give place to that of the Tartars, which hath continued ever since.

It was some time before the body of the unfortunate monarch was found. At last it was brought before the rebel Li, and by him used with the utmost indignity; after which he caused two of Whay-tsong's sons, and all his ministers, to be beheaded; but his eldest son happily escaped by flight. The whole empire

submitted peaceably to the usurper, except Prince U-fan-ghey, who commanded the imperial forces in the province of Lyau-tong. This brave prince, finding himself unable to cope with the usurper, invited the Tartars to his assistance; and Tsong-te their king immediately joined him with an army of 80,000 men. Upon this the usurper marched directly to Peking; but not thinking himself safe there, plundered and burnt the palace, and then fled with the immense treasure he had got. What became of him afterwards we are not told; but the young Tartar monarch was immediately declared emperor of China, his father Tsong-te having died almost as soon as he set his foot on that empire.

The new emperor, named *Sbun-chi*, or *Xun-chi*, began his reign with rewarding U-fan-ghey, by conferring upon him the title of king; and assigned him the city of Si-gnan-fu, capital of Shen-si, for his residence. This, however, did not hinder U-fan-ghey from repenting of his error in calling in the Tartars, or, as he himself used to phrase it, "in sending for lions to drive away dogs." In 1674, he formed a very strong alliance against them, and had probably prevailed if his allies had been faithful; but they treacherously deserted him one after another: which so affected him, that he died soon after. In 1681 Hong-wha, son to U-fan-ghey, who continued his efforts against the Tartars, was reduced to such straits that he put an end to his own life.

During this space, there had been some resistance made to the Tartars in many of the provinces. Two princes of Chinese extraction had at different times been proclaimed emperors; but both of them were overcome and put to death. In 1682, the whole ⁵¹Empire to-ally reduced. provinces were so effectually subdued, that the emperor Kang-hi, successor to Shun-chi, determined to visit his native dominions of Tartary. He was accompanied by an army of 70,000 men, and continued for some months taking the diversion of hunting. This he continued to do for some years; and in his journeys took Father Verbiest along with him; by which means we have a better description of these countries than could possibly have been otherwise obtained.

This prince was a great encourager of learning and ⁵²Christianity first encouraged and then persecuted. of the Christian religion; in favour of which last he published a decree, dated in 1692. In 1716, however, he revived some obsolete laws against the Christians; nor could the Jesuits with all their art preserve the footing they had got in China. The causes of this alteration in his resolution are, by the missionaries, said to have been the slanders of the mandarins; but, from the known character of the Jesuits, it will be readily believed, that there was something more at bottom. This emperor died in 1722, and was succeeded by his son Yon-ching; who not only gave no encouragement to the missionaries, but persecuted all Christians of whatever denomination, not excepting even those of the imperial race. At the beginning of his reign he banished all the Jesuits into the city of Canton, and in 1732 they were banished from thence into Ma-kau, a little island inhabited by the Portuguese, but subject to China. He died in 1736: but though the Jesuits entertained great hopes from his successor, we have not heard that they have yet met with any success.

Thus we have given an account of the most memorable

50
Unhappy
fate of the
emperor
and his fa-
mily.

China.

China.

rable transactions recorded in the Chinese history. It now remains only to describe the present state of the empire and its inhabitants, according to the best and latest accounts.

The climate as well as the soil of this extensive empire is very different in different parts; severe cold being often felt in the northern provinces, while the inhabitants of the southern ones are scarce able to bear the heat. In general, however, the air is accounted wholesome, and the inhabitants live to a great age.—The northern and western provinces have many mountains, which in the latter are cultivated, but in the north are barren, rocky, and incapable of improvement. On the mountains of Chenfi, Honan, Canton, and Fokien, are many forests, abounding with tall, straight trees, of different kinds, fit for building, and particularly adapted for masts and ship timber. These are used by the emperor in his private buildings; and from these forests enormous trunks are sometimes transported to the distance of more than 300 leagues. Other mountains contain quicksilver, iron, tin, copper, gold, and silver. Formerly these last were not allowed to be opened, lest the people should thereby be induced to neglect the natural riches of the soil: and it is certain, that, in the 15th century, the emperor caused a mine of precious stones to be shut, which had been opened by a private person. Of late, however, the Chinese are less scrupulous, and a great trade in gold is carried on by them. Many extravagant fables are told by the Chinese of their mountains, particularly of one in Chenfi which throws out flames, and produces violent tempests, whenever any one beats a drum or plays on a musical instrument near it. In the province of Fokien is a mountain, the whole of which is an idol, or statue of the god Fo. This natural colossus, for it appears not to have been the work of art, is of such an enormous size, that each of its eyes is several miles in circumference, and its nose extends some leagues.

China has several large lakes; the principal one is that named Poyang-hou, in the province of Kiang-si. It is formed by the confluence of four large rivers; extends near 100 leagues in length; and, like the sea, its waters are raised into tempestuous waves. The empire is watered by an immense number of rivers of different sizes, of which two are particularly celebrated, viz. the *Yang-tse-kiang*, or *son of the sea*, and *Hoang-ho*, or the *yellow river*. The former rises in the province of Yun-nan, and passing through Hou-quang and Kiang-nan, falls into the eastern ocean, after a course of 1200 miles, opposite to the island of Tson-ming, which is formed by the sand accumulated at its mouth. This river is of immense size, being half a league broad at Nanking, which is near 100 miles from its mouth. The navigation is dangerous, so that great numbers of vessels are lost on it. It runs with a rapid current, forming several islands in its course, which are again carried off and new ones formed in different places, when the river is swelled by the torrents from the mountains. These islands, while they remain, are very useful; producing great quantities of reeds ten or twelve feet high, which are used in all the neighbouring countries for fuel. The Hoang-ho, or Yellow river, has its name from the yellow colour given it by the clay and sand washed down in the time

of rain. It rises in the mountains which border the province of Te-tchuen on the west, and after a course of near 600 leagues, discharges itself into the eastern sea not far from the mouth of the Kiang. It is very broad and rapid, but so shallow that it is scarce navigable. It is very liable to inundations, often overflowing its banks, and destroying whole villages. For this reason it has been found necessary to confine it in several places by long and strong dykes; which yet do not entirely answer the purpose. The people of Honan, therefore, whose land is exceedingly low, have surrounded most of their cities with strong ramparts of earth faced with turf, at the distance of three furlongs.

The Chinese have been at great pains to turn their lakes and rivers to the advantage of commerce, by promoting an inland navigation. One of their principal works for this purpose, is the celebrated canal reaching from Canton to Peking, and forming a communication between the southern and northern provinces. This canal extends through no less a space than 600 leagues; but its navigation is interrupted in one place by a mountain, where passengers are obliged to travel 10 or 12 leagues over land. A number of other canals are met with in this and other provinces; most of which have been executed by the industry of the inhabitants of different cities and towns, in order to promote their communication with the various parts of the empire. M. Grosier remarks, that, in these works, the Chinese have “surmounted obstacles that perhaps would have discouraged any other people: such, for example, is part of a canal which conducts from *Chao-king* to *Ning-po*.” Near these cities there are two canals, the waters of which do not communicate, and which differ ten or twelve feet in their level. To render this place passable for boats, the Chinese have constructed a double glacis of large stones, or rather two inclined planes, which unite in an acute angle at their upper extremity, and extend on each side to the surface of the water. If the bark is in the lower canal, they push it up the plane of the first glacis by means of several capstans, until it is raised to the angle, when by its own weight it glides down the second glacis, and precipitates itself into the water of the higher canal with the velocity of an arrow. It is astonishing that these barks, which are generally very long and heavily laden, never burst asunder when they are balanced on this acute angle; however, we never hear of any accident of this kind happening in the passage. It is true, they take the precaution of using for their keels a kind of wood which is exceedingly hard, and proper for resisting the violence of such an effort.

The following remarkable phenomenon in a Chinese river is related by Father le Couteux, a French missionary. “Some leagues above the village Che-pai (says he), the river becomes considerably smaller, although none of its waters flow into any other channel; and, eight or nine leagues below, it resumes its former breadth, without receiving any additional supply, excepting what it gets from a few small rivulets, which are almost dry during the greater part of the year. Opposite to Che-pai it is so much diminished, that, excepting one channel, which is not very broad, I have passed and repassed it several times by the help of a com-

53
Climate,
soil, and
produce.54
Lakes and
rivers.

55

Canals.

56

Remark-
able river
which part-
ly sinks un-
der ground.

China.

mon pole. I was always surpris'd to find this river so narrow and shallow in that place; but I never thought of inquiring into the cause of it, until the loss of a bark belonging to a Christian family afforded me an opportunity. In that place where the river diminishes almost of a sudden, it flows with great impetuosity; and where it resumes its former breadth it is equally rapid. At the sixth moon, when the water was high and the wind strong, the bark I have mentioned arriving above Che-pai, was driven on a sand-bank; for between these two places the river is full of moveable sands, which are continually shifting their situation. The master of the boat dropped his anchor until the wind should abate, and permit him to continue his voyage; but a violent vortex of moveable sand, which was cast up from the bottom of the river, laid the bark on its side; a second vortex succeeded: then a third; and afterwards a fourth, which shattered the bark to pieces. When I arrived at the place where this bark had been lost, the weather was mild and serene; I perceived eddies in the current everywhere around, which absorbed, and carried to the bottom of the river whatever floated on the surface; and I observed at the same time, that the sand was thrown violently up with a vortical motion. Above these eddies the water was rapid, but without any fall; and in the place below, where the river resumes its usual course, no eddies are to be seen, but the sand is thrown up in the same violent manner; and in some places there are water-falls and a kind of small islands scattered at some distance from one another. These islands which appear above the surface of the water, are not solid earth, but consist of branches of trees, roots, and herbs collected together. I was told that these boughs rose up from the water, and that no one knew the place from whence they came. I was informed, that these masses, which were 40 or 50 feet in extent on that side on which we passed, were immoveable, and fixed in the bottom of the river; that it was dangerous to approach them, because the water formed whirlpools everywhere around them; that, however, when the river was very low, the fishermen sometimes ventured to collect the bushes that floated on its surface, and which they used for fuel. I am of opinion, that, at the place of the river which is above Che-pai, the water falls into deep pits, from whence it forces up the sand with that vortical motion; and that it flows under-ground to the other place, eight or nine leagues below, where it carries with it all the boughs, weeds, and roots, which it washes down in its course, and thus forms those islands which appear above its surface. We know there are some rivers that lose themselves entirely, or in part, in the bowels of the earth, and which afterwards arise in some other place; but I believe there never was one known to lose part of its water below its own channel, and again to recover it at the distance of some leagues."

57
Why China is subject to famines, notwithstanding its fertility.

It has already been said, that China is, in general, a fertile country; and indeed all travellers agree in this respect, and make encomiums on the extent and beauty of its plains. So careful are the husbandmen of this empire to lose none of their ground, that neither inclosure, hedge, nor ditch, nay, scarce a single tree, are ever to be met with. In several places the land yields two crops a-year; and even in the interval be-

China. tween the harvests the people sow several kinds of pulse and small grain. The plains of the northern provinces yield wheat; those of the southern, rice, because the country is low and covered with water. Notwithstanding all this fertility, however, the inhabitants are much more frequently afflicted with famine than those of the European nations, though the countries of Europe produce much less than China. For this two causes are assigned. 1. The destruction of the rising crops by drought, hail, inundations, locusts, &c. in which case China cannot like the European countries be supplied by importation. This is evident by considering how it is situated with regard to other nations. On the north are the Mogul Tartars, a lazy and indolent race, who subsist principally on the flesh of their flocks; sowing only a little millet for their own use. The province of Leatong, which lies to the north-east, is indeed extremely fertile, but too far distant from the capital and centre of the empire to supply it with provisions; and besides, all carriage is impracticable but in the winter, when great quantities of game, and fish, preserved in ice, are sent thither. No corn is brought from Corea to China; and, though the Japan islands are only three or four days sailing from the Chinese provinces of Kiang-nan and Che-kyang, yet no attempt was ever made to obtain provisions from thence; whether it be that the Japanese have nothing to spare, or on account of the insults offered by these islanders to foreign merchants. Formosa lies opposite to the province of Fo-kien; but so far is that island from being able to supply any thing, that in a time of scarcity it requires a supply from China itself. The province of Canton is also bounded by the sea, and has nothing on the south but islands and remote countries. One year, when rice was exceedingly scarce there, the emperor sent for F. Parranin, a Jesuit missionary, and asked him if the city of Macao could not furnish Canton with rice until the supply he had ordered from other provinces should arrive: but was informed that Macao had neither rice, corn, fruit, herbs, nor flocks; and that it generally got from China what was necessary for its subsistence.—The only method, therefore, the Chinese can take to guard against famines arising from these causes, is to erect granaries and public magazines in every province and most of the principal cities of the empire. This has at all times been a principal object of care to the public ministers; but though this mode of relief still takes place in theory, so many ceremonies are to be gone through before any supply can be drawn from those public repositories, that it seldom arrives seasonably at the places where it is wanted; and thus numbers of unhappy wretches perish for want. 2. Another cause of the scarcity of grain in this empire, is the prodigious consumpt of it in the composition of wines, and a spirituous liquor called *rack*. But though government is well apprized that this is one of the principal sources of famine throughout the empire, it never employed means sufficient to prevent it. Proclamations indeed have frequently been issued, prohibiting the distillation of rack; and the appointed officers will visit the still-houses and destroy the furnaces if nothing is given them; but on slipping some money into their hands, they shut their eyes, and go some-
where

China. where else to receive another bribe. When the mandarin himself goes about, however, these distillers do not escape quite so easily, the workmen being whipped and imprisoned, after which they are obliged to carry a kind of collar called the *Cangue*; the masters are likewise obliged to change their habitations and conceal themselves for a short time, after which they generally resume their operations. It is impossible, however, that any method of this kind can prove effectual in suppressing these manufactories while the liquors themselves are allowed to be sold publicly; and against this there is no law throughout the empire. Our author, however, justly observes, that in case of a prohibition of this kind, the grandees would be obliged to deny themselves the use of these luxuries, which would be too great a sacrifice for the good of the empire.

53
Immenſe
population.

The population of China is ſo great, in comparison with that of the European countries, that the accounts of it have generally been treated as fabulous by the weſtern nations; but by an accurate inveſtigation of ſome Chineſe records concerning the number of perſons liable to taxation throughout the empire, M. Groſier has ſhewed that it cannot be leſs than 200 millions. For this extraordinary population he aſſigns the following cauſes. 1. The ſtrict obſervance of filial duty throughout the empire, and the prerogatives of fraternity, which make a ſon the moſt valuable property of a father. 2. The infamy attached to the memory of thoſe who die without children. 3. The univerſal cuſtom by which the marriage of children becomes the principal concern of the parents. 4. The honours beſtowed by the ſtate on thoſe widows who do not marry a ſecond time. 5. Frequent adoptions, which prevent families from becoming extinct. 6. The return of wealth to its original ſtock by the diſinheriting of daughters. 7. The retirement of wives, which renders them more complaiſant to their huſbands, ſaves them from a number of accidents when big with child, and conſtrains them to employ themſelves in the care of their children. 8. The marriage of ſoldiers. 9. The fixed ſtate of taxes; which being always laid upon lands, never fall but indirectly on the trader and mechanic. 10. The ſmall number of failors and travellers. 11. To theſe may be added the great number of people who reſide in China only by intervals; the profound peace which the empire enjoys; the frugal and laborious manner in which the great live; the little attention that is paid to the vain and ridiculous prejudice of marrying below one's rank; the ancient policy of giving diſtinction to men and not to families, by attaching nobility only to employments and talents, without ſuffering it to become hereditary. And, 12. laſtly, A decency of public manners, and a total ignorance of ſcandalous intrigues and gallantry.

Extravaſant, however, and almoſt incredible as this account of the population of China may appear to ſome, we have very high and reſpectable authority for believing that it is much below the truth. Whether the cauſes of this phenomenon, as above enumerated by M. Groſier, be the only ones aſſignable, it is certain that the immenſe population of this country amounted to 333,000,000 at the time when Sir George Staunton *

viſited it in the capacity of ſecretary to the Britiſh plenipotentiary, as appears from the following eſtimate of the population of each province, made by Chow-ta-zhin, and taken from his official documents.

China.
59
Population
of the dif-
ferent pro-
vinces.

Provinces.	Population.
Pe-che-lee,	38,000,000
Kiang-nan, two provinces,	32,000,000
Kiang-fee,	19,000,000
Tche-kiang,	21,000,000
Fo-chen,	15,000,000
Hou-pe	} Houquang, { 14,000,000
Hou-nan	
Ho-nan,	25,000,000
Shan-tung,	24,000,000
Shan-fee,	27,000,000
Shen-fee,	18,000,000
Kan-fou,	12,000,000
Se-chuen,	27,000,000
Canton,	21,000,000
Quang-fee,	10,000,000
Yu-nan,	8,000,000
Koei-cheou,	9,000,000
	333,000,000

This prodigious ſum total may exceed the belief of thoſe who are only accuſtomed to calculate from analogy, not recollecting that China cannot have its population reduced by thoſe ſciti'e cauſes, *war* and *debauchery*, the former deſtroying mankind by thouſands, and the latter rendering them unproductive.

The government of China, according to the Abbé Un-imited authority of the emperor. 60
Groſier, is purely patriarchal. The emperor is more unlimited in his authority than any other potentate on earth; no ſentence of death, pronounced by any of the tribunals, can be executed without his conſent, and every verdict in civil affairs is ſubject to be reviſed by him; nor can any determination be of force until it has been confirmed by the emperor: and, on the contrary, whatever ſentence he paſſes is executed without delay; his edicts are reſpected throughout the empire as if they came from a divinity; he alone has the diſpoſal of all offices, nor is there any ſuch thing as the purchaſe of places in China; merit, real or ſuppoſed, raiſes to an office, and rank is attached to it only. Even the ſucceſſion to the throne is not altogether hereditary. The emperor of China has a power of chooſing his own ſucceſſor without conſulting any of his nobility; and can ſelect one not only from among his own children, but even from the body of his people; and there have been ſeveral inſtances of his making uſe of this right: and he has even a power of altering the ſucceſſion after it has once been fixed, in caſe the perſon pitched upon does not behave towards him with proper reſpect. The emperor can alſo prevent the princes of the blood from exerciſing the title, with which, according to the conſtitution of the empire, they are inveſted. They may indeed, notwithstanding this, poſſeſs their hereditary dignity; in which caſe they are allowed a revenue proportioned to their high birth, as well as a palace, officers, and

China. a court; but they have neither influence nor power, and their authority is lower than that of the meanest mandarin.

61
Mandarins
of different
classes.

The mandarins are of two classes, viz. those of letters, and the inferior sort, styled mandarins of arms. The latter by no means enjoy the same consideration with the former sort; indeed in China the literati are highly honoured, and to their influence M. Grosier supposes that we may in a great measure ascribe the mildness and equity of the government; though he thinks that the balance may incline rather too much in their favour. Several degrees, answering to those of bachelor, licentiate, and doctor, must be passed through before one can attain to the dignity of a mandarin of letters; though sometimes, by the favour of the emperor, it is conferred on those who have attained only the two first degrees: but even the persons who have gone through all the three, enjoy at first only the government of a city of the second or third class. When several vacancies happen in the government of cities, the emperor invites to court a corresponding number of the literati, whose names are written down in a list. The names of the vacant governments are then put into a box, raised so high that the candidates are able only to reach it with their hands; after which they draw in their turns, and each is appointed governor of the city whose name he has drawn.

There are eight orders of these mandarins in China. 1. The *calao*, from whom are chosen the ministers of state, the presidents of the supreme courts, and all the superior officers among the militia. The chief of this order presides also in the emperor's council, and enjoys a great share of his confidence. 2. The *te-biofe*, or man of acknowledged ability, is a title bestowed upon every mandarin of the second rank; and from these are selected the viceroys and presidents of the supreme council in the different provinces. 3. The *schong-tchueo*, or school of mandarins, act as secretaries to the emperor. 4. *T-tchuen-tao*. These keep in repair the harbours, royal lodging houses, and barks, which belong to the emperor, unless particularly engaged in some other office by his order. 5. The *ting-pi-tao* have the inspection of the troops. 6. The *tun-tien-hao* have the care of the highways. 7. The *ho-tao* superintend the rivers. 8. The *hai-tao* inspect the sea-coasts.

Thus the whole administration of the Chinese empire is intrusted to the mandarins of letters; and the homage paid by the common people to every mandarin in office, almost equals that paid to the emperor himself. This indeed flows from the nature of their government. In China it is a received opinion that the emperor is the father of the whole empire; that the governor of a province is the father of that province; and that the mandarin who is governor of a city is also the father of that city. This idea is productive of the highest respect and submission, which is not at all lessened by their great number; for though the mandarins of letters amount to more than 14,000, the same respect is paid to every one of them.

The mandarins of arms are never indulged with any share in the government of the state; however, to attain to this dignity, it is also necessary to pass through the degrees of bachelor, licentiate, and doctor of arms.

The accomplishments necessary for a mandarin of arms are, strength of body, with agility and readiness in performing the various military exercises, and comprehending the orders requisite for the profession of arms; an examination on these subjects must be undergone before the candidate can attain the wished-for dignity.

China.

62
Tribunal of
the manda-
rins of
arms.

The mandarins of arms have tribunals, the members of which are selected from among their chiefs; and among these they reckon princes, counts, and dukes; for all these dignities, or something equivalent to them, are met with in China. The principal of these tribunals is held at Peking, and consists of five classes, 1. The mandarins of the rear-guard, called *beou-fou*, 2. Of the left wing, or *tfa-fou*. 3. Of the right wing, or *yeou-feou*. 4. Of the advanced main-guard, or *te-hong fou*. 5. Of the advanced guard, or *tshen-fou*. These five tribunals are subordinate to one named *iong-tching-fou*; the president of which is one of the great lords of the empire, whose authority extends over all the military men in the empire. By his high dignity he could render himself formidable even to the emperor; but to prevent this inconvenience, he has for his assessor a mandarin of letters, who enjoys the title and exercises the function of superintendent of arms. He must also take the advice of two inspectors who are named by the emperor; and when these four have agreed upon any measure, their resolution must still be submitted to the revival of an higher court named *ping-pou*, which is entirely of a civil nature. The chief of these mandarins is a general of course, whose powers are equivalent to those of our commanders in chief; and below him are other mandarins who act as subordinate officers.

These two classes of mandarins compose what is called the nobility of China: but as we have already hinted, their office is not hereditary; the emperor alone continues or confers it. They have the privilege of remonstrating to the emperor, either as individuals or in a body, upon any part of his conduct which appears contrary to the interests of the empire. These remonstrances are seldom ill received, though the sovereign complies with them only when he himself thinks proper. The number of literary mandarins in China is computed at upwards of 14,000; and those of arms at 18,000; the former, however, are considered as the principal body in the empire; and this preference is thought to damp the military ardour of the nation in general, and to be one cause of that weakness in war for which the Chinese are remarkable.

63
Military
force.

The armies of this empire are proportioned to its vast extent and population; being computed in time of peace at more than 700,000. Their pay amounts to about twopence half-penny and a measure of rice per day, though some of them have double pay, and the pay of a horseman is double that of a foot soldier; the emperor furnishes a horse, and the horseman receives two measures of small beans for his daily subsistence; the arrears of the army being punctually paid up every three months.

The arms of a horseman are, a helmet, cuirass, lance, and sabre; those of a foot soldier are a pike and sabre; some have fuses, and others bows and arrows. All these are carefully inspected at every review; and if any of them are found in the least rusted, or otherwise

in

China.

in bad condition, the possessor is instantly punished; if a Chinese, with 30 or 40 blows of a stick; or if a Tartar, with as many lashes.

64
Use of fire-
arms lost
and re-
vived.

Though the use of gun-powder is certainly very ancient in China, it appears to have been afterwards totally lost, at least fire-arms seem to have been almost entirely unknown some centuries ago. Three or four cannon were to be seen at that time about the gates of Nanking; but not a single person in China knew how to make use of them; so that, in 1621, when the city of Macao made a present of three pieces of artillery to the emperor, it was found necessary also to send three men to load them. The utility of these weapons was quickly perceived by the execution which the three cannon did against the Tartars, at that time advanced as far as the great wall. When the invaders threatened to return, the mandarins of arms gave it as their opinion, that cannons were the best arms they could make use of against them. They were then taught the art of casting cannon by F. Adam Schaal and Verbieft, two Jesuit missionaries, and their artillery was increased to the number of 320 pieces; at the same time that they were instructed in the method of fortifying towns, and constructing fortresses and other buildings according to the rules of modern architecture.

The best soldiers in China are procured from the three northern provinces, the others being seldom called forth, but allowed to remain at peace with their families; indeed there is not often occasion for exerting their military talents, unless it be in the quelling of an insurrection, when a mandarin or governor usually accompanies them. They march in a very tumultuous manner, but want neither skill nor agility in performing their different evolutions. They, in general, handle a sabre well, and shoot very dexterously with bows and arrows. There are in China more than 2000 places of arms; and through the different provinces there are dispersed about 3000 towers or castles, all of them defended by garrisons. Soldiers continually mount guard there; and on the first appearance of tumult, the nearest sentinel makes a signal from the top of the tower, by hoisting a flag in the day time, or lighting a torch in the night; when the neighbouring garrisons immediately repair to the place where their presence is necessary.

65
Account of
the great
wall.

The principal defence of the empire against a foreign enemy is the great wall which separates China from Tartary, extending more than 1500 miles in length, and of such thickness that six horsemen may easily ride abreast upon it. It is flanked with towers two bow-shots distant from one another; and it is said that a third of the able-bodied men in the empire were employed in constructing it. The workmen were ordered under pain of death, to place the materials so closely, that not the least entrance might be afforded for any instrument of iron; and thus the work was constructed with such solidity, that it is still almost entire, though 2000 years have elapsed since it was constructed. This extraordinary work is carried on not only through the low lands and valleys, but over hills and mountains; the height of one of which was computed by F. Verbieft at 1236 feet above the level of the spot where he stood. According to F. Martini it begins at the gulf of Lea-tong, and reaches

to the mountains near the city of Kin on the Yellow river; between which places it meets with no interruption except to the north of the city of Suen in the province of Pecheli, where it is interrupted by a ridge of hideous and inaccessible mountains, to which it is closely united. It is likewise interrupted by the river Hoang-ho; but for others of an inferior size, arches have been constructed, through which the water passes freely. Mr Bell informs us, that it is carried across rivers, and over the tops of the highest hills, without the least interruption, keeping nearly along that circular range of barren rocks which incloses the country; and, after running about 1200 miles, ends in impassable mountains and sandy deserts. The foundation consists of large blocks of stone laid in mortar; but all the rest is of brick. The whole is so strong and well built, that it scarcely needs any repairs; and, in the dry climate in which it stands, may remain in the same condition for many ages. When carried over steep rocks, where no horse can pass, it is about 15 or 20 feet high; but when running through a valley, or crossing a river, it is about 30 feet high, with square towers and embrasures at equal distances. The top is flat, and paved with cut stone; and where it rises over a rock or eminence, there is an ascent made by an easy stone stair. "This wall (our author adds) was begun and completely finished in the short space of five years; and it is reported, that the labourers stood so close for many miles, that they could hand the materials from one to another. This seems the more probable, as the rugged rocks among which it is built must have prevented all use of carriages; and neither clay for making bricks, nor any kind of cement, are to be found among them."

To this account of the most astonishing production of human labour and industry to be met with on the face of the earth, we may add, that if to its prodigious length of 1500 miles, we assume as true, the probable conjecture that its dimensions throughout are nearly the same as where it was crossed by the British embassy, it contains materials more than sufficient to erect all the dwelling houses in England and Scotland, even admitting their number to be 1,800,000, and each to contain 2000 cubic feet of masonry. In this calculation the huge projecting masses of stone called towers, are not included, which of themselves would erect a city as large as London. To assist the conceptions of our readers still farther respecting this singular and stupendous fabric, we shall only observe, that were its materials converted into a wall 12 feet high and four feet thick, it would possess sufficient length to surround the globe at its equatorial circumference.

The whole civil government of China is managed by the following courts. 1. The emperor's grand council, composed of all the ministers of state, presidents and assessors of the six sovereign courts, and of three others, to be afterwards mentioned. This is never assembled but on affairs of the greatest importance; the emperor's private council being substituted to it in all cases of smaller moment. 2. The chief of the other courts furnishes mandarins for the different provinces, watches over their conduct, keeps a journal of their transactions, and informs the emperor of them, who rewards or punishes according to the report he gets.

This

China.

66

Courts by
which the
civil go-
vernment
is mana-
ged.

China.

This second tribunal, which may be called a kind of civil inquisition, is subdivided into four others; the first entrusted with the care of selecting those who, on account of their learning or other good properties, are capable of filling the offices of government; the second appointed to take care of the conduct of the mandarins; the third affixing the seals to the different public acts, giving the seals to mandarins, and examining those of the different dispatches; while the fourth inquires into the merit of the grandees of the empire, not excepting the princes of the imperial blood themselves. The principal sovereign court to which these four last are subordinate is called *Lii-pou*.

2. *Hou-pou*, or the grand treasurer, superintends all the finances of the state; is the guardian and protector of the treasures and dominions of the emperor, keeping an account of his revenues, &c. superintending the management and coining of money, the public magazines, customhouses; and, lastly, keeping an exact register of all the families in the empire. To assist this court, 14 others are appointed throughout the different provinces of the empire.

3. *Li-pou*, or the court of ceremonies. "It is an undoubted fact (says M. Grosier), that ceremonies form, in part, the base of the Chinese government. This tribunal therefore takes care to support them, and enforce their observance; it inspects also the arts and sciences. It is consulted by the emperor when he designs to confer particular honours; takes care of the annual sacrifices offered up by him, and even regulates the entertainments which he gives either to strangers or to his own subjects. It also receives and entertains foreign ambassadors, and preserves tranquillity among the different religious sects in the empire. It is assisted by four inferior tribunals.

4. *Ping-pou*, or the tribunal of arms, comprehends in its jurisdiction the whole militia of the empire; inspecting also the fortresses, magazines, arsenals, and store-houses of every kind, as well as the manufactories of arms both offensive and defensive; examining and appointing officers of every rank. It is composed entirely of mandarins of letters; and the four tribunals depending upon it consist also of literati."

5. The *hong-pou* is the criminal bench for the whole empire, and is assisted by 14 subordinate tribunals.

6. The *cong-pou*, or tribunal of public works, surveys and keeps in repair the emperor's palaces, as well as those of the princes and viceroys, and the buildings where the tribunals are held, with the temples, tombs of the sovereigns, and all public monuments. It has besides the superintendence of the streets, public highways, bridges, lakes, rivers, and every thing relating either to internal or foreign navigation. Four inferior tribunals assist in the discharge of these duties; the first drawing the plans of public works; the second directing the work-shops in the different cities of the empire; the third surveying the causeways, roads, bridges, canals, &c.; and the fourth taking care of the emperor's palaces, gardens, and orchards, and receiving their produce.

67
Partiality
of govern-
ment to-
wards the
Chinese.

All the tribunals are composed, one half of Chinese, and the other of Tartars; and one of the presidents of each superior tribunal is always a Tartar born. None of the courts above described, however,

has absolute authority even in its own jurisdiction; nor can its decisions be carried into execution without the concurrence of another tribunal, and sometimes of several others. The fourth tribunal, for instance, has indeed under its jurisdiction the whole troops of the empire; but the payment of them is entrusted with the second; while the sixth has the care of the arms, tents, chariots, barks, and stores necessary for military operations; so that nothing relative to these can be put in execution without the concurrence of all the three tribunals.

China.

To prevent any unlawful combination among the tribunals, each has its *cenfor* appointed. This is an officer whose duty is merely to watch over the proceedings of the court, without deciding upon any thing himself. He assists therefore at all assemblies, revises all their acts, and without acquainting the court in the least with either his sentiments or intentions, immediately informs the emperor of what he judges to be amiss. He likewise gives information of the behaviour of the mandarins, either in the public administration of affairs, or in their private conduct; nay, sometimes he will not scruple to reprimand the emperor for what he supposes to be erroneous in his conduct.

These censors are never removed from their places but in order to be promoted; and thus, holding their offices for life, they have the greater courage to speak out when they observe any impropriety or abuse. Their accusation is sufficient to set on foot an inquiry, which generally leads to a proof; in which case the accused is discharged from his office, and never held in any estimation afterwards. The complaints of the censors, however, are referred to the very tribunals against whose members they complain; though, being afraid of an accusation themselves, they very seldom pass sentence against the accusers.

Besides all this, the censors also form a tribunal of their own, named *tou-tche-yven*. Its members have a right of remonstrating with the emperor, whenever his own interest or that of the public renders it necessary. They inspect all lawyers and military men in public employments. "In short (says M. Grosier), they are, morally speaking, placed between the prince and the mandarins; between the mandarins and the people; between the people and families; between families and individuals; and they generally unite to the importance of their office incorruptible probity and invincible courage. The sovereign may, if he proceeds to rigour, take away their lives; but many of them have patiently suffered death, rather than betray the cause of truth, or wink at abuses. It is not sufficient therefore to have got rid of one, they must all be treated in the same manner; the last that might be spared would tread in the same steps with no less resolution than those who went before him. In the annals of no nation do we find an example of such a tribunal, yet it appears to be necessary in all, without exception. We must not, however, imagine, that the privileges of a censor give him a right to forget his duty to his sovereign, or to communicate to the public those remarks which he takes the liberty of making to him: were he only to give the least hint of them to his colleagues, he would be punished with death; and he would share the same fate did he, in any of his representations,

68

Censors.

China. China.
 tentations, suffer a single word, inconsistent with moderation or respect, to escape him."

69 Two courts peculiar to China. There are still two other courts in China, both of them peculiar to the empire, which deserve to be mentioned. The first is that of princes; and which, in conformity with its title, is composed of princes only. In the registers of this tribunal are inscribed the names of all the children of the imperial family as soon as they are born: and to these are also consigned the dignities and titles which the emperor confers upon them. This is the only tribunal where the princes can be tried; and here they are absolved or punished according to the pleasure of the judges.

The other tribunal is that of history, called by the Chinese *han-lin-yuan*. It is composed of the greatest geniuses of the empire, and of men of the most profound erudition. These are entrusted with the education of the heir apparent to the throne, and the compilation and arrangement of the general history of the empire; which last part of their office renders them formidable even to the emperor himself. From this body the mandarins of the first class, and the presidents of the supreme class, are generally chosen.

70 Filial piety the basis of all their laws. The basis of all the civil laws of the Chinese is filial piety. Every mandarin, who is a governor either of a province or city, must instruct the people assembled round him twice a-month, and recommend to them the observance of certain salutary rules, which are summed up in a few short sentences, and such as no person can ever be supposed capable of forgetting.

71 Of their marriages. The Chinese are allowed only to have one wife, whose rank and age must be nearly equal to that of their husbands; but they are allowed to have several concubines, whom they may admit into their houses without any formality, after paying the parents a sum of money, and entering into a written engagement to use their daughters well. These concubines, however, are all in subjection to the lawful wife; their children are considered as hers; they address her as mother, and can give this title to her only. A person that has once been married, whether man or woman, may lawfully marry again, but it is then no longer necessary to study equality of age or condition. A man may choose his second wife from among his concubines; and, in all cases, this new marriage requires very few formalities. A widow is absolute mistress of herself, and can neither be compelled by her parents to marry again, nor to continue in a state of widowhood, contrary to her own inclination. Those of moderate rank, however, who have no children, do not enjoy the same privilege; as the parents of the former husband can dispose of her in marriage, not only without her consent, but without her knowledge. The law authorizes the disposal of them in this manner, in order to indemnify the relations of the deceased husband for the money they may have cost him. If the wife is left big with child, this cannot take place, until she is delivered; nor can it be done at all if she brings forth a son. There are likewise two exceptions; 1. when the parents of the widow assign her a proper maintenance; and, 2. if the widow embraces a religious life, and becomes a bonzeffe.

72 Divorces, unlawful marriages, &c. Divorces are allowed in China in cases of adultery, mutual dislike, incompatibility of tempers, jealousy,

&c. No husband, however, can put away or sell his wife until a divorce is legally obtained; and if this regulation be not strictly observed, the buyer and seller become equally culpable. If a wife, lawfully married, privately withdraws herself from her husband, he may immediately commence an action at law; by the sentence of which she becomes his slave, and he is at liberty to sell her to whom he pleases. On the other hand, if a husband leaves his wife for three years, she is at liberty, after laying her case before the mandarins, to take another husband; but if she were to anticipate their consent, she would be liable to a severe punishment.

Marriage is deemed illegal in China in the following cases. 1. If the young woman has been betrothed to a young man, and presents have been given and received by the parents of the intended husband and wife. 2. If in the room of a beautiful young woman another be substituted of a disagreeable figure; or if the daughter of a free man marry his slave; or if any one give his slave to a free woman, pretending to her parents that he is his son or relation. In all these cases the marriage is null and void; and all those who have had any share in making up the match are severely punished.

3. Any mandarin of letters is forbidden to form an alliance with any family residing in the province or city of which he is governor.

4. No Chinese youth can enter into a state of marriage during the time of mourning for his father or mother; and if promises have been made before, they cease immediately on that event taking place. After the usual time of mourning is expired, however, the parents of the intended bride are obliged to write to those of the young man, putting him in mind of his engagement.

5. Marriage is also suspended when a family experiences any severe misfortune, and even if a near relation were thrown into prison; though this may be set aside, provided the unfortunate person give his consent.

6. Two brothers cannot marry two sisters; nor is a widower at liberty to marry his son to the daughter of a widow whom he chooses for his own wife. A man is also forbidden to marry any of his own relations, however distant the degree of consanguinity between them.

In China every father of a family is responsible for the conduct of his children, and even of his domestics; all those faults being imputed to him which it was his duty to have prevented. Every father has the power of selling his son, "provided (says the law) the son has a right of selling himself." This custom, however, is barely tolerated among the middling and inferior ranks; and all are forbidden to sell them to comedians, or people of infamous character or very mean stations.

In China a son remains a minor during the whole lifetime, and is even liable for the debts contracted by his father, those from gaming only excepted. Adoption is authorized by law, and the adopted child immediately enters into all the rights of a lawful son; only the law gives a right to the father of making a few dispositions in favour of his real children. The children, however, whether adopted or not, cannot succeed

China.

ceeded to the dignity or titles of their father, though they may to his estate. The emperor alone can confer honours; and even then they must be resigned when the person attains the age of 70; though this resignation is considered as an advice rather than a law. The will of a father cannot be set aside in China on account of any informality; nor can any mother in this empire make a will.

Though the Chinese laws authorize slavery, yet the power of the master extends only to those matters which concern his own service; and he would be punished with death for taking advantage of his power to debauch the wife of his slave.

By the laws of China husbandmen are exempt from the payment of taxes after they have begun to till the earth to the beginning of harvest.

73
Criminal
code.

It appears, from recent information respecting many interesting particulars relating to China, that the utmost attention seems to have been paid to the different degrees of enormity attached to those actions of men which are denominated criminal. The code of laws is pronounced the reverse of sanguinary, and it is affirmed by competent judges, that if the practice in all respects coincided with the theory, few nations could boast of a milder or more effectual administration of justice. But while they do not consider the crime of pilfering a few small pieces of money as of equal enormity with the shedding of human blood, yet they pay too little attention to the three different circumstances under which that action may exist; either as accidental, unintentional as to the extent of taking away life, or maliciously premeditated. Even foreigners who have the misfortune to kill a Chinese, however casually it may be done, have been punished in the very same manner as a traitor or deliberate assassin. As foreigners intending to reside in China may be at a loss to determine how, when, and by what various means their lives may be endangered, the following abstract of the criminal code of that country may perhaps be beneficial to some of our readers.

1. A man who kills another on the supposition of theft, shall be strangled, according to the law of homicide committed in an affray.
2. A man who fires at another with a musket, and kills him, shall be beheaded, as in cases of wilful murder. If the sufferer be wounded, but not mortally, the offender shall be sent into exile.
3. A man who puts to death a criminal who had been apprehended, and made no resistance, shall be strangled, according to the law against homicide committed in an affray.
4. A man who falsely accuses an innocent person of theft (in cases of greatest criminality) is guilty of a capital offence; in all other cases the offenders, whether principals or accessaries, shall be sent into exile.
5. A man who wounds another unintentionally, shall be tried according to the law respecting blows given in an affray, and the punishment rendered more or less severe, according to the degree of injury sustained.
6. A man who, intoxicated with liquor, commits outrages against the laws, shall be exiled to a desert country, there to remain in a state of servitude.

For this abstract we are indebted to the humane in-

China.

terference of the supercargoes of the East India Company, on account of the disagreeable disputes which frequently took place with the Chinese government, owing to accidents of the most trivial nature, which the people sometimes met with from the British in the port of Canton.

The blood of a traitor is supposed to be contaminated in this country to the 10th generation, although the law in general is conceived to be satisfied with implicating the nearest male relatives in the guilt of the actual perpetrator of the crime, but with commutation of punishment from death to exile. It appears to us, that nothing can be conceived more tyrannical than a law which pretends to inflict punishment on an innocent person, since no man can be a traitor, merely from the circumstance of his being the relation of one, and the absurdity of supposing that a non-existence is capable of committing a crime, must be obvious to every man. The fifth law in the forementioned extract is peculiarly cruel and unjust, since it subjects a man to different degrees of punishment, according to the different effects which those actions may produce. It is with a degree of national pride that we turn from this cruel, absurd specimen of Chinese legislation, this strange judicial thermometer, if we may be allowed the expression, to the nice discriminations which are made by the laws of our own country respecting the shedding of blood, the gradations of guilt attending which we have already mentioned, and which are distinguished by the appropriate names of *manslaughter*, *culpable homicide*, and *wilful murder*.

The denunciations of Moses, it may be said, have some resemblance to this gothic code of the Chinese, especially when he declares that the deity would visit the iniquities of the fathers upon the children to the third and fourth generation. It is not our province in this account of China, to write an apology for Moses in this particular instance, although it must be granted that he had a most obstinate and refractory race of beings to govern, and to preserve a becoming degree of order and subordination among them. He might therefore have nothing more in view than political expedience, an opinion which we are the more encouraged to entertain, when we find the prophet Ezekiel reprobating the idea of making the innocent suffer for the guilty, in the following beautiful passage. "What mean ye that ye use this proverb concerning the land of Israel, saying, the fathers have eaten four grapes, and the children's teeth are set on edge? As I live, saith the Lord, ye shall not have occasion any more to use this proverb in Israel. Behold all souls are mine; as the soul of the father, so also the soul of the son, is mine. The soul that sinneth, it shall die. The son shall not bear the iniquity of the father, neither shall the father bear the iniquity of the son: the righteousness of the righteous shall be upon him, and the wickedness of the wicked shall be upon him."

In criminal matters every person accused must be examined before five or six tribunals; and whose inquiries are directed not only against him, but against his accuser, and the witnesses that appear in the cause. He is, however, obliged to remain in prison during the process: "but (says M. Grosier) the Chinese prisons are not horrible dungeons, like those of so many other nations; they are spacious, and have even a degree

China. degree of convenience. One of the mandarins is obliged to inspect them frequently; and this he does with the greater punctuality, as he must answer for those who are sick. He is obliged to see them properly treated, to send for physicians, and to supply them with medicines at the emperor's expence. If any of them dies, he must inform the emperor, who perhaps will order some of the higher mandarins to examine whether the former has discharged his duty faithfully or not.

74
Method of
inflicting
the basti-
nado.

The slightest punishment in China is the bastinado; and the number of blows is to be determined by the degree of the offender's guilt. Twenty is the lowest number; and in this case the punishment is considered as having nothing infamous in it, but being only a simple paternal correction. In this way the emperor sometimes orders it to be inflicted on his courtiers; which does not prevent them from being afterwards received into favour, and as much respected as before. Every mandarin may inflict the bastinado when any one forgets to salute him, or when he sits in judgment in public. The instrument of correction is called *pan-tsee*, and is a piece of bamboo a little flatted, broad at the bottom, and polished at the upper extremity, in order to manage it more easily with the hand. When the punishment is to be inflicted, the magistrate sits gravely behind a table, having on it a bag filled with small sticks, while a number of petty officers stand around him, each furnished with these *pan-tsees*, and waiting only for his signal to make use of them. The mandarin then takes out one of the little sticks contained in the bag, and throws it into the hall of audience. On this the culprit is seized and stretched out with his belly towards the ground; his breeches are pulled down to his heels, and an athletic domestic applies five smart blows with his *pan-tsee*. If the judge draws another small stick from the bag, another officer succeeds, and bestows five more blows; and so on until the judge makes no more signals. When the punishment is over, the criminal must throw himself on his knees, incline his body three times to the earth, and thank the judge for the care he takes of his education.

75
The *cangue*,
or wooden
collar.

For faults of a higher nature, the carrying of a wooden collar, called by the Portuguese the *cangue*, is inflicted. This machine is composed of two pieces of wood hollowed out in the middle, which, when put together, leave sufficient room for the neck. These are laid upon the shoulders of the criminal, and joined together in such a manner, that he can neither see his feet nor put his hands to his mouth; so that he is incapable of eating without the assistance of another. This disagreeable burden he is obliged to carry day and night; its weight is from 50 to 200 pounds, according to the enormity of the crime, to which the time of carrying it is also proportioned. For robbery, breaking the peace, or disturbing a family, or being a notorious gambler, it is generally carried three months. During all this time the criminal is not allowed to take shelter in his own house, but is stationed for a certain space of time, either in some public square, the gate of a city or temple, or perhaps even of the tribunal where he was condemned. On the expiration of his term of punishment, he is again brought before the judge, who exhorts him in a friend-

ly manner to amend; and after giving him 20 sound blows discharges him. China.

Banishment is inflicted for crimes of a nature inferior to homicide, and the duration is often for life, if the criminals be sent into Tartary. Some culprits are condemned to drag the royal barks for three years, or to be branded in the cheeks with a hot iron, indicating the nature of their transgressions. Robbery between relations is more severely punished than any other; and that is accounted the most atrocious where younger brothers or nephews appropriate to themselves beforehand any part of the succession in which they have a right to share with their elder brothers or nephews.

Information against a father or mother, grandfather or grandmother, uncle or eldest brother, even though the accusation be just, is punished with 100 blows of the *pan-tsee* and three years banishment. If the accusation be false, it is punished with death. Deficiency in proper filial respect to a father, mother, grandfather, or grandmother, is punished with 100 blows of the *pan-tsee*; abusive language to these relations is death by strangling; to strike them is punished by beheading; and if any one presumes to hurt or maim them, his flesh is torn from his bones with red-hot pincers, and he is cut into a thousand pieces. Abusing an elder brother is punished with 100 blows of the *pan-tsee*; striking him, with the punishment of exile.

Homicide, even though accidental, is punished with death in China. A rope about six or seven feet in length, with a running noose, is thrown over the criminal's head; and a couple of domestics belonging to the tribunal pull it strongly in different directions. They then suddenly quit it, and in a few moments give a second pull; a third is seldom necessary to finish the business. Beheading is accounted in China the most dishonourable of all punishments, and is reserved only for desperate assassins, or those who commit some crime equally atrocious with murder. To be cut in a thousand pieces is a punishment inflicted only upon state criminals or rebellious subjects. It is performed by tying the criminal to a post, scalping the skin from the head and pulling it over the eyes. The executioner then tears the flesh from different parts of the unhappy wretch's body: and never quits this horrible employment till mere fatigue obliges him to give over: the remains of the body are then left to the barbarous spectators, who finish what he has begun. Though this punishment, however, has been inflicted by some emperors with all the dreadful circumstances just mentioned, the law orders only the criminal's belly to be opened, his body to be cut into several pieces, and then thrown into a ditch or river.

The torture, both ordinary and extraordinary, is used in China. The former is applied to the hands or feet: for the hands, small pieces of wood are applied diagonally between the fingers of the criminal; his fingers are then tied close with cords, and he is left for some time in that painful situation. The torture for the feet is still worse. An instrument, consisting of three cross pieces of wood, is provided, that in the middle being fixed, the others moveable. The feet of the criminal are then put into this machine, which squeezes them so close that the ankle bones become flat. The extraordinary torture consists in

^{China.} making small gashes in the body, and then tearing off the skin like thongs. It is never applied but for some great crime, such as treason, or where the criminal's guilt has been clearly proved, and it is necessary to make him discover his accomplices.

⁷⁹
M. Grosier's general view of the Chinese laws.

Notwithstanding these dreadful punishments, M. Grosier is at great pains to prove that the laws of the Chinese, with regard to criminal matters, are extremely mild. "One law (says he) will no doubt appear exceedingly severe and rigorous; it inflicts the punishment of death on those who use pearls. Those who read the history of China will be apt to fall into certain mistakes respecting the penal laws of that nation. Some of its sovereigns have indulged themselves in gratifying sanguinary caprices which were not authorized by the laws, and which have often been confounded with them; but these princes are even yet ranked among the number of tyrants, and their names are still abhorred and detested throughout the whole empire. The Chinese, in their criminal procedure, have a great advantage over all other nations: it is almost impossible that an innocent man should ever become a victim to a false accusation: in such cases the accuser and witnesses are exposed to too much danger. The slowness of the process, and the numberless revisions it undergoes, are another safeguard for the accused. In short, no sentence of death is ever carried into execution until it has been approved and confirmed by the emperor. A fair copy of the whole process is laid before him; a number of other copies are also made out, both in the Chinese and Tartar languages, which the emperor submits to the examination of a like number of doctors, either Tartars or Chinese. When the crime is of great enormity, and clearly proved, the emperor writes with his own hand at the bottom of the sentence, "When you receive this order, let it be executed without delay." In cases where the crime, though punishable by death according to law, is ranked only in the ordinary class, the emperor writes at the bottom of the sentence, Let the criminal be detained in prison, and executed in autumn;" that being the season in which they are generally executed, and all on the same day.

⁸⁰
Cases in which crimes may be pardoned.

The emperor of China never signs an order for the execution of a criminal till he has prepared himself by fasting. Like other monarchs he has the power of giving pardons; but in this respect is much more limited than any other. The only cases in which the Chinese monarch can remit the punishment inflicted by law are, 1. To the son of a widow who has not married again; 2. To the heir of an ancient family; 3. The descendants of great men or citizens who have deserved well of their country; and, 4. lastly, The sons or grandsons of a mandarin, who has become illustrious, and distinguished himself by faithfully discharging the duties of his office. Neither a child, nor a man of very advanced age, can be cited before a tribunal. The son of a very aged father and mother is pardoned, if private property or the public peace be not hurt by giving him a pardon; and if the sons of such a father and mother be all guilty, or accomplices in the same crime, the youngest is pardoned in order to comfort his parents.

In China the accused are always treated with ten-

^{China.} derness and lenity, being accounted innocent until their guilt be clearly proved; and even then, liberty excepted, they are scarce allowed to want for any thing. A jailor is punished who behaves rigorously towards his prisoners; and the judges must likewise answer at their peril for any additions to the severity of the law; deposition being the slightest punishment inflicted upon them.

Substitution is sometimes allowed by the laws of China; so that the near relation of a guilty person may put himself in the criminal's place, provided, however, that the chastisement be slight, and the accused his ancient friend. The sons, grandsons, wife, and brothers of a banished Chinese, are allowed to follow him into exile; and the relations of all persons are permitted to visit them in prisons, and to give them every assistance in their power; to do which good offices they are even encouraged, instead of being prevented.

Every city in China is divided into different quarters, each of which is subjected to the inspection of a certain officer, who is answerable for whatever passes in the places under his jurisdiction. Fathers of families, as we have already observed, are answerable for the conduct of their children and domestics. Neighbours are even obliged to answer for one another, and are bound to give every help and assistance in cases of robbery, fire, or any accident, especially in the night time. All the cities are furnished with gates, which are barricaded on the commencement of night. Centinels are also posted at certain distances throughout the streets, who stop all who walk in the night, and a number of horsemen go round the ramparts for the same purpose; so that it is almost impossible to elude their vigilance by favour of the darkness. A strict watch is also kept during the day-time; and all those who give any suspicion by their looks, accent, or behaviour, are immediately carried before a mandarin, and sometimes even detained until the pleasure of the governor be known.

⁸¹
Of the cities and their government.

Private quarrels do not often happen in China, and it is rare that they are attended with a fatal issue. The champions sometimes decide the quarrel with their fists, but most frequently refer the case to a mandarin, who very often orders them both a sound drubbing. None but military people are permitted to wear arms in public; and this privilege is extended even to them only during the time of war, or when they accompany a mandarin, mount guard, or attend a review. Prostitutes are not allowed to remain within the walls of a city, or to keep a house of their own even in the suburbs. They may, however, lodge in the house of another; but that other is accountable for every disturbance which may happen on their account.

In all the Chinese cities, and even in some of their ordinary towns, there is an office where money may be borrowed upon pledges at the common rate of the country; which, however, is no less than 30 per cent. Every pledge is marked with a number when left at the office, and must be produced when demanded; but it becomes the property of the office if left there a single day longer than the term agreed upon for the payment of the money. The whole transaction remains an inviolable secret; not even the name of

⁸²
Borrowing of money.

China. of the person who leaves the pledge being inquired after.

This mode of procuring a supply of money for the exigencies of the moment, has been long known in Britain, and the people who thus lend money on pledges under the sanction of government, have a most exorbitant interest, as well as in China, but we are sorry to add, that it is by no means conducted with such profound secrecy. The person's name and surname who offers a pledge must be inserted in the pawn-broker's books, who is thus enabled to make the transaction as public as he pleases. Institutions of this nature are no doubt of considerable utility to the modest poor during a period of embarrassment; but the monstrous evils to which they have given rise are more than sufficient to counterbalance their advantages. We should deem an open avowal of poverty and want to be infinitely preferable to an application to such a sink of corruption and extortion, assured that genuine distresses will never want a friend among the sons of benevolence or philanthropy.

⁸³
Of the Chinese roads.

Great attention is paid by the administration of China to the convenience of travellers. The roads are generally very broad, all of them paved in the southern provinces, and some in the northern; but neither horses nor carriages are allowed to pass along these. In many places valleys have been filled up, and rocks and mountains cut through, for the purpose of making commodious highways, and to preserve them as nearly as possible on a level. They are generally bordered with very lofty trees, and in some places with walls eight or ten feet high, to prevent travellers from going into the fields; but openings are left in proper places, which give a passage into cross roads that lead to different villages. Covered seats are erected on all the great roads, where travellers may shelter themselves from the inclemency of the weather; temples and pagods are also frequent, into which travellers are admitted without scruple in the day-time, but often meet with a refusal in the night. In these the mandarins only have a right to rest themselves as long as they think proper. There is, however, no want of inns on the great roads, or even the cross ones in China; but they are ill supplied with provisions; and those who frequent them are even obliged to carry beds along with them to sleep on, or else take up with a plain mat.

Towers are erected on all the roads of this great empire, with watch-boxes on the top, with flag-staffs, for the convenience of signals in case of any alarm. These towers are square, and generally constructed of brick, but seldom exceed twelve feet in height. They are built, however, in sight of one another, and are guarded by soldiers, who run with great speed from one to another, carrying letters which concern the emperor. Intelligence of any remarkable event is also conveyed by signals; and thus the court is informed with surprising quickness of any important matter. Those which are built on any of the roads conducting to court, are furnished with battlements, and have also

very large bells of cast iron. According to law these towers should be only five *lys*, about half a French league, distant from one another.

China.
⁸⁴
Method of conveyance.

There is no public post-office in China, though several private ones have been established; but the couriers and officers charged with dispatches for the empire have only a right to make use of them. This inconvenience, however, excepted, travellers find conveyance very easy from one part of China to another. Great numbers of porters are employed in every city, all of whom are associated under the conduct of a chief, who regulates all their engagements, fixes the price of their labour, receives their hire, and is responsible for every thing they carry. When porters are wanted, he furnishes as many as may be necessary, and gives the same number of tickets to the traveller; who returns one to each porter when they have conveyed their loads to an appointed place. These tickets are carried back to the chief, who immediately pays them from the money he received in advance. On all the great roads in China there are several offices of this kind, which have a settled correspondence with others; the travellers therefore have only to carry to one of these offices a list of such things as they wish to have transported: this is immediately written down in a book; and though there should be occasion for two, three, or four hundred porters, they are instantly furnished. Every thing is weighed before the eyes of their chief, and the hire is fivepence per hundred weight for one day's carriage. An exact register of every thing is kept in the office; the traveller pays the money in advance, after which he has no occasion to give himself any farther trouble; on his arrival at the city he designs, his baggage is found at the corresponding office, and every thing is delivered to him with the most scrupulous exactness.

The customhouses are here regulated by the general police of the country; and according to M. Grosier's account, these customhouse officers are the most civil in the world. They have no concern with any class of people but the merchants, whom they take care not to distress by any rigorous exactness; neither, though they have authority to do so, do they stop travellers till their baggage is examined, nor do they ever require the smallest fee from them. Duties are paid either by the piece or the load; and in the former case credit is given to the merchant's book without asking any questions. A mandarin is appointed by the viceroy of each province to inspect the customhouses of the whole district; and the mandarins have also the care of the post-offices.

⁸⁵
Custom-houses.

In former times the only money used in China was made of small shells, but now both silver and copper coin are met with. The latter consists of round pieces about nine-tenths of an inch (A) in diameter, with a small square hole in the middle, inscribed with two Chinese words on one side, and two Tartar ones on the other. The silver pieces are valued only by their weight. For the convenience of commerce the metal is therefore cast into plates of different sizes:
and

⁸⁶
Money of the empire.

(A) The Chinese foot is longer by one hundredth part than the French, and the inch is divided into ten parts.

China.

and for want of small coin, a Chinese always carries about him his scales, weights, and a pair of scissars to cut the metal. This operation is performed by putting the silver between the scissars, and then knocking them against a stone till the pieces drop off. In giving of change, however, people have no right to value silver by the numerical value of copper, this being entirely regulated by the intrinsic value of the metals. Thus, an ounce of silver will sometimes be worth 1000 copper pieces, and sometimes only 800; and thus the copper money of China may frequently be sold for more than it would pass for in commerce. The emperor would lose much by this recoinage, were he not the sole proprietor of all the copper mines in China. It is, however, expressly forbidden to employ copper coin in any manufacture where it might be employed as plain copper, and it is also forbidden to be sold for the purpose of melting: but, if the price of the metal has not fallen, the infraction of this law is not very severely punished. On the other hand, if the value of unwrought copper exceeds that of the coin, a quantity of the latter is issued out to restore the equilibrium.

To keep up a constant circulation of all the coin in the empire, the Chinese government are attentive to preserve an equilibrium between the proportional value of the gold and silver; that is, to regulate the intrinsic value of each in such a manner that the possessor of silver may not be afraid to exchange it for copper, nor the possessor of copper for silver. The method used for this purpose is, when silver becomes scarce, to make all the payments for some time in silver; but if copper, to make them all for some time in that metal only.

87
Of the Chinese commerce.

The commerce of China is under the inspection of the tribunal of finances; but on this subject the Chinese entertain an opinion quite different from that of the Europeans. Commerce, according to them, is only useful as far as it eases the people of their superfluities, and procures them necessaries. For this reason they consider even that which is carried on at Canton as prejudicial to the interest of the empire. "They take from us (say the Chinese) our silks, teas, and porcelain: the price of these articles is raised through all the provinces: such a trade therefore cannot be beneficial. The money brought us by Europeans, and the high-priced baubles that accompany it, are mere superfluities to such a state as ours. We have no occasion for more bullion than what may be necessary to answer the exigencies of government, and to supply the relative wants of individuals. It was said by Kouan-tse, two thousand years ago, That the money introduced does not enrich a kingdom in any other way than as it is introduced by commerce. No commerce can be advantageous long, but that which consists in a mutual exchange of things necessary or useful. That trade, whether carried on by barter or money, which has for its object the importing of articles that tend to the gratification of pride, luxury, or curiosity, always supposes the existence of luxury: but luxury, which is an abundance of superfluities among certain classes of people, supposes the want of necessaries among a great many others. The more horses the rich put to their carriages, the greater will be the number of those who are obliged to walk on

foot; the larger and more magnificent their houses are, so much the more confined and wretched must those of the poor be; and the more their tables are covered with a variety of dishes, the more must the number of those increase who are reduced to the necessity of feeding upon plain rice. Men, united by society in a large and populous kingdom, can employ their industry, talents, and economy, to no better purpose than to provide necessaries for all, and procure convenience for some."

China.

88
The only commerce considered by the Chinese as advantageous to their empire, is that with Russia and Tartary; by which they are supplied with those furs so necessary in the northern provinces. The disputes concerning the limits of the respective empires of Russia and China seem to have paved the way to this commerce. These disputes were settled by treaty on the 27th of August 1689, under the reign of Ivan and Peter Alexiowitz. The chief of the embassy on the part of Russia was Golovin governor of Siberia; and two Jesuits were deputed on the part of the emperor of China; and the conferences were held in Latin, with a German in the Russian ambassador's train, who was acquainted with that language. By this treaty the Russians obtained a regular and permanent trade with China, which they had long desired; but in return they yielded up a large territory, besides the navigation of the river Amour. The first intercourse had taken place in the beginning of the 17th century; at which time a small quantity of Chinese merchandise was procured by some Russian merchants from the Kalmuck Tartars. The rapid and profitable sale of these commodities encouraged certain Siberian wayvodes to attempt a direct and open communication with China. For this purpose several deputations were sent to the emperor; and though they failed of obtaining the grant of a regular commerce, their attempts were attended with some consequences of importance. Thus the Russian merchants were tempted to send traders occasionally to Peking; by which means a faint connexion was preserved with that metropolis. This commerce, however, was at last interrupted by the commencement of hostilities on the river Amour; but after the conclusion of the treaty in 1689, was resumed with uncommon alacrity on the part of the Russians: and the advantages thence arising were found to be so considerable, that a design of enlarging it was formed by Peter the Great. Isbrand Ides, a native of the duchy of Holstein, then in the Russian service, was therefore despatched to Peking in 1692; by whose means the liberty of trade, before confined to individuals, was now extended to caravans. In the mean time, private merchants continued to trade as before, not only with the Chinese, but also at the head quarters of the Mogul Tartars. The camp of these roving Tartars, which was generally stationed near the confluence of the Orhon and Toulra rivers, between the southern frontiers of Siberia and the Mogul desert, thus became the seat of an annual fair. Complaints, however, were soon made of the disorderly behaviour of the Russians; on which the Chinese monarch threatened to expel them from his dominions entirely, and to allow them neither to trade with the Chinese nor Moguls. This produced another embassy to Peking in 1719, when matters were again adjusted to the

China. the satisfaction of both parties. The reconciliation was of no long duration; for the Russians having soon renewed their disorderly behaviour, an order for their expulsion was issued in 1722, and all intercourse between the two nations forbidden. The differences were once more made up in 1727, and a caravan allowed to go to Peking once in three years, provided it consisted of no more than a hundred persons; and that during their stay their expences should not, as formerly, be defrayed by the emperor of China. The Russians at the same time obtained permission to build a church within the precincts of the caravansary; and four priests were allowed to reside at Peking for the celebration of divine service; the same indulgence being granted to some Russian scholars, for the purpose of learning the Chinese language, and qualifying themselves for being interpreters between the two nations. This intercourse continued till the year 1755; since which time no more caravans have been sent to China. It was first interrupted by a misunderstanding betwixt the two courts; and though that difference was afterwards made up, no caravans have been sent ever since. The empress of Russia, sensible that the monopoly of the fur trade (which was entirely confined to the caravans belonging to the crown, and prohibited to individuals) was prejudicial to commerce, gave it up in favour of her subjects in 1762; and the centre of commerce betwixt the two nations is now at Kiatka. Here the trade is entirely carried on by barter. The Russians are prohibited from exporting their own coin; finding it more advantageous to take goods in exchange than to receive bullion at the Chinese standard. The principal exports from Russia are furs of different kinds; the most valuable of which are those of sea otters, beavers, wolves, foxes, martins, fables, and ermines; the greater part of which are brought from Siberia and the newly discovered islands; but as they cannot supply the demand, there is a necessity for importing foreign furs to Petersburg, which are afterwards sent to Kiatka. Various kinds of cloth are likewise sent to China, as well as hardware, and live cattle, such as horses, camels, &c. The exports from China are, raw and manufactured silk, cotton, porcelain, rhubarb, musk, &c. The government of Russia likewise reserves to itself the exclusive privilege of purchasing rhubarb. It is brought to Kiatka by some Bukharian merchants, who have entered into a contract to supply the crown with it in exchange for furs: the exportation of the best rhubarb is forbidden under severe penalties, but yet is procured in sufficient quantities, sometimes by clandestinely mixing it with inferior roots, and sometimes by smuggling it directly. Great part of Europe is supplied with rhubarb from Russia.

89
Emperor's
revenue.

The revenue of the emperor of China amounts to more than 41 millions sterling; and might easily be increased, did the sovereign incline to burden his subjects with new impositions. When Lord Macartney visited this vast empire in the capacity of his Britannic majesty's ambassador, the revenue of the Chinese emperor was not less than 66 millions sterling; but it cannot be supposed that a very large share of this enormous sum is actually expended by the emperor, after deducting the almost incalculable number of salaries which it is destined to pay, together with a standing

China. army of 1,800,000 men. Yet upon the supposition that each individual is taxed equally, this enormous sum will amount to no more than 4s. a head annually, while the same analogy applied to Britain will make an individual share amount to 3l. There is reason, however, to conclude, that the Chinese, in the above estimate of their standing army, have been rather hyperbolic, for Lord Macartney, from the information communicated by Vang-ta-zin, makes the whole of the expences of government to leave a surplus for the use of the emperor of 14,043,743l. sterling, which we presume would be impossible, were their standing army as enormous as some of the Chinese pretend.

Sum total of the revenue,	L. 66,000,000
Civil establishment, L.	1,973,333
Military ditto,	49,982,933
	<hr/> 51,956,266

Surplus for the emperor, L. 14,043,734* * Barrow's

Travels,
p. 407.

The annual expences of government are indeed immense, but they are regulated in such a manner as never to be augmented but in cases of the utmost necessity. It even happens very often that administration makes greater savings every year. When this happens to be the case, the surplus serves to increase the general treasure of the empire, and prevents the necessity of new impositions in time of war, or other public calamities. The greater part of the taxes are paid in kind; those, for instance, who breed silk worms, pay their taxes in silk, the husbandmen in grain, the gardeners in fruits, &c. This method, at the same time that it is exceedingly convenient for the subject, is no way detrimental to the public interest. There are numbers of people everywhere in the service of government, who are thus furnished with food and clothing; so that the commodities collected as taxes are almost consumed in the provinces where they are levied; what remains is sold for the behoof of the emperor, and the money deposited in the imperial treasury. The taxes paid in money arise principally from the customs and sale of salt (which belongs entirely to the emperor), from the duties paid by vessels entering any port, and from other imposts on various branches of manufactures. Excepting these, the trader scarcely contributes any thing to the exigencies of the state, and the mechanic nothing at all; the whole burden of taxation thus falling upon the husbandman. This burden is regulated in proportion to the extent and fertility of his lands; and the greatest care has been taken to manage matters so, that he may neither be overcharged in the imposition nor harassed in the levying of the duties. "The registering of lands (says M. Grosier), so often and to no purpose projected in France, has been long practised in this empire, notwithstanding its prodigious extent."

The levying of taxes in China is as simple as the nature of the thing will admit of. The duties levied from towns and villages are carried to cities of the third class; then they are conducted to those of the second; then to those of the first; and at last to the capital. The levying and imposition of taxes is submitted to the tribunal of finances; and matters are so managed, that besides the consumption in each district

90
Of the
taxes in
China.

China. for discharging the ordinary expences of government, something is left by way of reserve for answering accidental demands, and to be ready in cases of necessity. This sum becomes gradually less from the capital to cities of the first, second, and third class. A proper statement of what is paid in the provinces, of what is reserved in the different cities, or contained in the different treasuries of the empire, is subjected to the examination of the grand tribunal of finances. This revises the whole, and keeps an exact account of what is consumed, and of whatever surplus may be left.

91
Of lending money, and deficiencies in paying interest.

Lending money upon interest has been in use in China for about 2000 years. It has often been abolished, and as often established. The interest, as has been already hinted, is no less than 30 per cent. and the year is only lunar. A tenth part of this interest is paid monthly: and concerning neglects of payment, the following laws have been enacted. "However much the debt may have accumulated by months or years, the principal and interest shall remain always the same. Whoever infringes this law shall receive 40 blows of a *pan-see*; or an hundred, if he uses any artifice to add the principal and interest together." This law is explained by the following. "Whoever shall be convicted before a mandarin of not having paid a month's interest, shall receive ten blows; twenty for two months, and thirty for three; and in this manner as far as sixty; that is to say, to the sixth month. The debtor is then obliged to pay principal and interest; but those who obtain payment by using violence and force are condemned to receive 24 blows.

Many Chinese writers have endeavoured unsuccessfully to show why government should allow such exorbitant interest to be taken for money; but the most satisfactory and rational account seems to be, that the great interest of money prevents the rich from purchasing much land; as landed estates would only embarrass and impoverish them, their produce being so much inferior to that of money. The patrimony of a family in China is seldom divided; and it never happens there, as in almost every other country, that wealth and riches are engrossed by one part of the nation, while the other possesses nothing.

92
Agriculture greatly encouraged.

Agriculture is by the Chinese considered as the first and most honourable of all professions; so that in this empire the husbandman enjoys many and great privileges, while the merchant and mechanic are much less esteemed. He is considered as next in dignity to officers of state, from whom indeed they very frequently originate. The soldier in China cultivates the ground, and even the priests are employed in agriculture, when their convents happen to be endowed with land. From the principle that the emperor is absolute proprietor of the soil, one would imagine that the tenant must hold his share of it by a very precarious tenure, yet it is certain that when any man is dispossessed, his own culpable conduct is the cause. The Chinese are so habituated to consider a piece of land as their own, while they continue to be punctual in the payment of their rent, that a Portuguese resident in Macao who attempted to raise the rent of his tenants, ran the hazard of losing his life. There are no prodigiously overgrown farms in China, no monopolizers of farms, no wholesale dealers in grain, but every man has it in his

power to carry his produce to a free and open market. Part of the crop is allowed to be used in distillation; but if the harvest happens to be bad, this operation is prohibited. In China, the tillage of the earth is not only encouraged by law, but also by the example of the emperor, who annually tills the earth with his own hands. The beginning of spring in China is always reckoned to be in the month of February; but it belongs to the tribunal of mathematics to determine the precise day. The tribunal of ceremonies announces it to the emperor by a memorial; in which every thing requisite to be done by him is mentioned with the most scrupulous exactness. The sovereign then names 12 of the most illustrious persons in his court to accompany him, and to hold the plough after he has performed his part of the ceremony. Among these there are always three princes of the blood, and nine presidents of supreme courts; and if any of them are too old and infirm to undergo the fatigue, the substitutes must be authorized by the emperor. The festival is preceded by a sacrifice, which the emperor offers up to *Chang-ti* (the supreme God); after which he and his attendants prepare themselves by three days fasting and continence. Others are appointed by the emperor, on the evening before the ceremony, to go and prostrate themselves at the sepulchre of his ancestors, and to acquaint them, that, on the day following, he intends to celebrate a grand sacrifice. This is offered upon a small mount a few furlongs distant from the city, which, by the indispensable rules of the ceremony, must be 50 feet in height. The *Chang-ti* is invoked by the emperor, who sacrifices under the title of sovereign pontiff, and prays for an abundant harvest in favour of his people. He then descends, accompanied by the three princes and nine presidents who are to put their hands to the plough along with him; the field set apart for this purpose being at a small distance from the mount. Forty labourers are selected to yoke the oxen, and to prepare the seeds which the emperor is to sow; and which are of five different kinds, viz. wheat, rice, two kinds of millet, and beans. They are brought to the spot in magnificent boxes, carried by persons of the most distinguished rank. The emperor then lays hold of the plough, and turns up several furrows; the princes of the blood do the same, and then the presidents; after which the emperor throws into the furrows the five kinds of seeds already mentioned: lastly, four pieces of cotton-cloth, proper for making dresses, are distributed to each of the labourers, who assist in yoking the oxen and preparing the seeds; and the same presents are made to forty other persons who have only been spectators of the ceremony.

93
Ceremony of the emperor tilling the earth with his own hands.

94
O' the peasants.

"We must not (says M. Grosier) judge of the Chinese peasants from those of Europe, especially in what relates to the lights acquired by education. Free schools are very numerous in every province of China, and even some of the villages are not destitute of this advantage. The sons of the poor are there received as readily as those of the rich; their duties and their studies are the same; the attention of the masters is equally divided between them; and from this obscure source talents often spring, which afterwards make a conspicuous figure on the grand stage of life. Nothing is more common in China than to see the son of

China.

of a peasant governor of that province in which his father had long toiled in cultivating only a few acres. The father himself, if taken from his plough, and elevated to a superior sphere, might, by reviving the instruction he received in his youth, and especially if he be endowed with genius, find himself fully competent for his new employment."

95
Grozier's
defence of
the Chinese
from the
charge of
murdering
and expo-
sing their
children.

The Chinese have been greatly reproached with the inhuman practice of murdering their children; but though our author cannot deny that they are guilty of this practice, he excuses them by saying, that "the crime when committed in China is commonly owing to the fanaticism of idolatry; a fanaticism which prevails only among the lowest of the people. It is either in obedience to the oracle of a bonze, to deliver themselves from the power of magic spells, or to discharge a vow, that these infatuated wretches precipitate their children into the river: they imagine that, by doing so, they make an expiatory sacrifice to the spirit of the river. All nations of antiquity almost have disgraced themselves by the like horrid practices; but the Chinese are far from countenancing this barbarity on that account. Besides, these criminal sacrifices are never practised but in certain cantons of China, where the people, blinded by idolatry, are the dupes of prejudice, fanaticism, and superstition.—It often happens also, that the bodies of those children which are seen floating on the water have not been thrown into it till after their death; and this is likewise the case with those which are found in the streets, or lying near the public roads. The poverty of the parents suggests this dismal resource, because their children are then buried at the expence of the public. Exposing of children in public places is a custom tolerated in China; and government employs as much vigilance to have them carried away in the morning, as it bestows care on their education. This is certainly giving people intimation to expose their children in the night-time, and no doubt encourages the practice; but the dictates of humanity are here united to those of sound policy. No law in China authorizes mutilation: there are indeed eunuchs in the empire, but their number is much less than what it is generally supposed to be by Europeans. The greater part of the eunuchs belonging to the emperor and empresses have no higher employment than that of sweeping the courts of justice."

96
Gazette of
Peking.

Like the capital cities of European kingdoms, Peking, the metropolis of the Chinese empire, is furnished with a gazette, which circulates into the remotest provinces, and which is even considered by administration as an essential part of the political constitution. It is printed daily at Peking, and contains an account of all those objects to which the attention of administration is directed. In this gazette may be seen the names of all those mandarins who are stripped of their employments, and the causes of their disgrace; it mentions also the names of all those delinquents who are punished with death; of the officers appointed to fill the places of the disgraced mandarins; the calamities which have afflicted any of the provinces; the relief given by government; and the expences incurred by administration for the subsistence of the troops, supplying the wants of the people, repairing or erecting public works; and, lastly, the remonstrances made to the sovereign by the superior tribunals, either with

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regard to his public decisions or private conduct, and sometimes even with regard to both. Nothing, however, is contained in this gazette that has not immediately come from the emperor, or been submitted to his inspection; and immediate death would be the consequence of inserting a falsehood in this ministerial paper.

No law or sentence, as has already been said, is of any force, until the emperor's seal has been affixed to it. This is about eight inches square, and is made of fine jasper, a kind of precious stone much esteemed in China; of which only the emperor is allowed to have a seal. Those given to princes as marks of honour are composed of gold; the seals of the viceroys and great mandarins, of silver; while those of inferior mandarins and magistrates are made only of lead or copper. The size of those seals is greater or smaller according to the rank their possessors hold in the tribunals or as mandarins; and when any of them happens to be worn out, intimation must be sent to the next superior tribunal; on which a new one is sent, and the old one must then be delivered up. The commission of every inspector sent into the provinces must also be confirmed by the emperor's seal. The duty of these officers is to examine into the conduct of governors, magistrates, and private individuals; and instances are recorded of emperors themselves assuming the office of inspectors in some of the provinces. These officers are not only superior to all the magistrates, but even to the viceroys of the provinces themselves. When a superior magistrate behaves ill to an inferior one, the former instantly becomes the prisoner of the inspector, and is suspended from his office until he has cleared himself from every imputation laid to his charge. The viceroy, however, is allowed to enjoy his office until the report of the inspector has been transmitted to the emperor.

These viceroys are distinguished by the title of *Tsong-tou*, and are always mandarins of the first class, possessing an almost unlimited power within their districts. They march abroad with all the pomp of royal magnificence, never quitting their palaces, on the most trifling occasion, without a guard of 100 men. A viceroy is the receiver-general of all the taxes collected in the province, transmitting them to the capital, after having reserved what he judges necessary for the demands of his district. All law-suits must be brought before his tribunal; and he has the power of passing sentence of death, but it cannot be put in execution without being first carried to the emperor. Every three years he sends to court a report of the conduct of the mandarins subordinate to him; and according to the contents they are either continued or disgraced. Those of whom he makes an unfavourable report are punished in proportion to their delinquency; while, on the other hand, those who have the good fortune to be well reported, are rewarded in a similar proportion.

The principal mandarins are sometimes broke and dismissed from all their employments, while others are only removed some degrees lower. Those who have been degraded ten steps run a great risk of never being employed again. These degraded mandarins are kept in perpetual remembrance of their misfortune, by being obliged to mention it in every public order they issue forth in their inferior station; thus: "I such a mandarin, degraded one, two, three, &c. steps, command

China.

97

Seals of the
emperor,
mandarins,
&c.

98

Power of
the vice-
roys of pro-
vinces.

99

Degradation of
mandarins.

China. mand and order," &c. Over these inferior mandarins the inspector of the province has a very unlimited authority, and can, by his own power, deprive them of their employments for a great offence; nor does he consult the court excepting where the immediate punishment of the criminal is not necessary. Every one of the mandarins, of whatever rank or denomination, is obliged, once in three years, to give in writing an exact account of the faults he has committed in the execution of his office. If he is a mandarin belonging to any of the four first classes, this confession is examined at court; but if it is made by any of the inferior ones, it must be laid before the provincial tribunal of the governor. Government, however, is not satisfied even with this confession; inquiry is made into the truth of it, and the conduct of the mandarin is scrutinized with the utmost severity, the informations being subjected to the tribunal of mandarins; where they are carefully examined, the merits and demerits of those subjected to this political inquisition carefully balanced, and their names afterwards divided into three classes. The first consists of those for whom rewards and preferment are intended; the second, for whom gentle reproof and admonition are thought necessary; and the third, of those who are to be suspended for some time, or removed altogether, from their offices. Of these last some are allowed to continue; but they receive no salary, and are not only deprived of all their emoluments, but even of their honours. If they have been guilty of any action tending to oppress the people, or to occasion a famine or scarcity among the lower ranks, their punishment is not confined to dismissal from their offices, but they are also criminally impeached. The family burying-place of every Chinese is accounted sacred; none dares cut down the trees with which it is overshadowed until they become decayed with age; and even then, not until their condition has been attested by a mandarin: but for certain crimes against government or the people, the burying-place of a mandarin is rased to the foundation. No kind of punishment, however, inflicted on a father, is supposed in the least to affect the character of his son; and therefore, when the latter is asked by the emperor concerning his family, he will perhaps coolly answer, My father was disgraced for such a crime, my grandfather was beheaded for such another," without the acknowledgment being in the least detrimental. On the contrary, by great and important services, it is possible for him to wipe out these stains from the memory of his ancestors.

Though the empire of China is governed by Tartar princes, the latter seem to bestow much more care and attention on the Chinese than their own natural subjects. Should any dispute arise between a Chinese and Tartar, the former must have greatly deviated from the rules of justice, if he is not acquitted even by those tribunals which are composed of half Chinese and half Tartars. The slightest fault committed by a Tartar mandarin is always severely punished; but the punishment of the Chinese is often mitigated if the delinquent be a Chinese; and the same severity is exercised towards those of the military department. Those faults, however, are punished with the greatest severity which hurt the interests of the people; for which reason they seldom fall a sacrifice to that class of petty

China. tyrants who in other countries prey upon and devour them. Every superior mandarin is obliged to inform himself of the faults of his inferiors, and expose them; nay, he would be punished for them himself if he did not.

Very little regard, as we have already had occasion to observe, is paid to hereditary right in China. Even the princes of the blood enjoy no other privilege by birth but that of wearing a yellow girdle; and the names of their children, with the exact time of their birth, are inscribed in a yellow book appropriated to that purpose. Collateral princes are distinguished by an orange girdle, and their children are marked in a book of a red colour. The surnames of the princes of the reigning family are determined by the emperor alone; the rest not being allowed to assume any name that too much resembles those of the Moguls or Chinese. The rank even of the emperor's sons diminishes one degree every generation; so that, at the seventh, only the eldest branch has a title to wear the yellow girdle, the rest being sunk into the rank of plain citizens. An hereditary sovereignty, however, passes from one eldest son to another; and this title cannot be forfeited, unless the possessor be guilty of some crime. In this case the emperor appoints to the succession either one of his younger brothers or a cousin; but these must be always chosen from the same branch, as the lawful branch cannot be deprived of its right without the condemnation of all who compose it. The only hereditary authority of the other princes exists among those troops called the *Tartar bands*. There they enjoy, without opposition, that rank which they derive from their birth, but in every thing else are on a level with others. They are subjected to a military examination at stated periods, and are always promoted or degraded according to the degree of skill they exhibit. The same trial is undergone by the heir apparent and his sons; the only indulgence shewn them being, that schools are appointed for their particular use. The princes are likewise indulged with a tribunal appropriated on purpose for them, and before which alone they can be tried. An insult offered to a prince decorated with the yellow girdle is punished with death; but if he has omitted to put it on, the aggressor escapes with a bastinading. A prince may be put to death by the emperor's consent; but he escapes every slighter corporal punishment by paying a fine. Untitled princes have very few privileges superior to those of common citizens; and are generally very poor, unless possessed of some lucrative office. Thus they are sometimes reduced to the necessity of accepting the highest pay of a common soldier in the Tartar bands. When they, or any of their children, however, enter into the marriage state, the emperor usually makes them a present of 100 ounces of silver. He will also relieve them on other occasions, assist their widows and orphans, &c. but in all this never departs from the most exact rules of economy; so that the mandarins in this respect are much better than the relations of the sovereign himself.

With regard to the ancient religion of China, F. F. Amiot's Amiot informs us, that, after making every possible account of research, comparing and reasoning upon his observations, he at last concluded, that "the Chinese are a distinct people, who have still preserved the characteristic marks of their first origin; a people whose primitive religion of China." 101

China.

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tive doctrine will be found, by those who take the trouble of investigating it thoroughly, to agree in its essential parts with the doctrine of the chosen people, before Moses, by the command of God himself, had conigned the explanation of it to the sacred records; a people, in a word, whose traditional knowledge, when freed from whatever the ignorance or superstition of later ages has added to it, may be traced back from age to age, and from epocha to epocha, without interruption, for the space of 4000 years, even to the renewal of the human race by the grandson of Noah." The *king*, or canonical books of the Chinese, everywhere inculcate the belief of a Supreme Being, the author and preserver of all things. Under him they mention the names of *Tien*, or heaven; *Chang-tien*, or Supreme heaven; *Chang-ti*, or Supreme Lord; and of *Hoang-chan-ti*, Sovereign and Supreme Lord: "Names (says M. Grosier) corresponding to those which we use when we speak of God, the Lord, the Almighty, the Most High."

According to the Chinese books, the Supreme Being is the principle of every thing that exists, and the father of all living; he is eternal, immoveable, and independent; his power knows no bounds; his sight equally comprehends the past, present, and the future, penetrating even into the inmost recesses of the heart. Heaven and earth are under his government; all events, all revolutions, are the consequences of his will; he is pure, holy, and impartial; wickedness offends his sight; but he beholds with an eye of complacency the virtuous actions of men. Severe, yet just, he punishes vice in a striking manner even on the throne, and often precipitates from thence the guilty, to place upon it the man who walks after his own heart, whom he hath raised from obscurity. Good, merciful, and full of pity, he relents on the repentance of the wicked: public calamities, and the irregularities of the seasons, are only salutary warnings, which his fatherly goodness gives to men to induce them to reform and amend.

The performance of religious worship at the proper and appointed times, has given occasion to the great exactness with respect to the kalendar, which is remarkable throughout the empire of China; and all the celebrated emperors have begun their reigns with a reformation of it. Our historians, however, not contented with discovering in the Chinese religion the fundamental principles of the ancient patriarchal religion, have also found in it evident symptoms of a knowledge of the Trinity as believed among Christians. "Among the ancient Chinese characters (says M. Grosier), which have escaped the ravages of time, we find the following Δ . According to the dictionary of *Kang-hi*, this signifies union; according to the *Choue-ouen* (that book so highly esteemed in China) Δ is three united in one; it derives it from the characters *jou* (to enter or penetrate), and *ye*, one; whence it concludes, that Δ means three united, penetrated, or incorporated into one. According to another book, accounted a learned and accurate explanation of the ancient characters, ' Δ signifies strict union, harmony, the chief good of man, of heaven, and of earth; it

is the union of the three *tsai* (powers, principles, or intelligences); for, united, they direct, create, and nourish together. The image $\frac{1}{1}$ (three united in one figure) is not so obscure in itself; however it is difficult to reason upon it without being deceived: on this subject it is difficult to speak."

"Father Amiot, spite of all the objections which the critics of Europe may make, seems to conjecture, that the character Δ might have been, among the ancient Chinese, the symbol of the most holy Trinity; 'and the more so (he adds), as the ancient books furnish a number of texts, which gives us reason to suppose them to have been possessed of some knowledge of this sublime mystery.' The book *See-ki* says, 'The emperor formerly offered up a solemn sacrifice every three years to the Spirit, Trinity and Unity, *Chin-fan-ye*.' The following celebrated text of *Lao-tse* has long been known in Europe. '*Tao* is one by nature: the first begot the second; two produced the third; the three created all things.'

"F. Amiot quotes another passage, which appears to be no less singular. 'He who is, as it were, visible, and cannot be seen, is named *Kbi*; he who may be heard, yet speaketh not to the ears, is called *Hii*; he whom, in a manner, we feel, yet cannot touch, is named *Ouei*. In vain do we interrogate our senses respecting these three; our reason, which alone can give us any satisfaction, will tell us that they make only one. Above there is no light; below there is no darkness. He is eternal; there is no name which can be given him. He resembles nothing that exists; he is an image without figure; a figure without matter; his light is surrounded by darkness. If we look up to him above, we behold no beginning; if we follow him, we discover no end. From what the *Tao* hath been at all times, conclude what he is, viz. that he is eternal: he is the beginning of wisdom.' The commentaries which explain this passage speak in such strong and precise terms, that F. Amiot forbears to quote them, lest he might incur the censure of too many incredulous readers (A)."

The sacrifices of the Chinese were first offered up in the open fields, or on some mountain, upon what they call the *Tan*, which signifies a quantity of stones thrown together in a round form, or simply a round heap of earth. A double fence, called *Kiao*, composed of turf and branches of trees, was raised around this; and, in the space left between the two fences, two lesser altars were erected on the right and left; upon which, immediately after the sacrifice offered up to the *Tien*, they sacrificed also to the *Cheng*, or good spirits of every rank, and to their virtuous ancestors. The sovereign alone had a right of sacrificing upon this *Tan*; and the custom of sacrificing to inferior spirits, according to the Chinese commentators, may be traced even to the days of *Fo-hi* himself. The same writers add, that, in addressing themselves to the *Chang-ti*, they considered him as the sovereign lord of the universe, clothed with all that power which was necessary to satisfy them with regard to the different

D 2

objects

(A) It is a singular circumstance that F. Amiot should have passed over in silence such unintelligible mummery, without a single animadversion. Reason humbly confesses every word of it to be absolutely incomprehensible; and faith itself has almost as hard a struggle in believing it as the never-to-be-fathomed creed of Athanasius.

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objects of their requests; but that, in offering up their prayers to the inferior objects of worship, they only implored their protection and mediation with the Chang-ti.

While the empire was confined within narrow bounds, one mountain was sufficient for the sacrifices; but in process of time it became necessary to consecrate four others. These were situated at the extremities of the empire, and were supposed to correspond with the four quarters of the world; and the prince went successively every year to one of these mountains to offer up sacrifices; taking occasion at the same time to show himself to his people, and to inform himself of their wants. This custom subsisted for a long time; but at length it was found convenient to add a fifth mountain in the centre of the empire; and ever since these have been called the five *Yò*, or the five mountains of sacrifice. This method of subjecting the emperor to regular annual journeys could not but be attended with many inconveniences. It was found necessary on this account to consecrate some spot in the neighbourhood of his palace, which might be substituted for the *Yò* upon all occasions when the emperor could not repair to them. An edifice was therefore erected, which at once represented the *Kiao*, *Tan*, and the *Hall of ancestors*. This last was a necessary part of the edifice; because it was incumbent on those who offered up sacrifices, first to repair to this hall, and acquaint their ancestors with what they were about to perform; and thither also they returned after sacrificing, to thank the same ancestors for the protection they had received from the Chang-ti; after which they offered up a sacrifice of thanksgiving in honour of them, and performed certain other ceremonies to show their respect. The building contained five separate halls, appropriated to different purposes: originally it had neither paintings nor ornaments of any kind, and a staircase of nine steps conducted to the principal entrance. Afterwards, however, it was much more richly ornamented, each of the five halls being decorated with columns, over which others were placed that supported a second roof. In succeeding times it was stripped of all its ornaments, with a view to bring back religion to its primitive simplicity. Its four gates were covered with fine moss, representing the branches of which the double fence of the ancient *Kiao* were formed. The ridge of the roof was covered with the same, and the whole was encompassed by a canal filled with water at the time of offering up the sacrifices. To this a second building was added, which they called the *temple of neatness*, and which was used only for purifications and ceremonies, the former being entirely consecrated to the worship of the Chang-ti.

At present there are only two temples in Peking, named the *Tien-tan* and the *Ti-tan*; in the construction of which all the elegance of Chinese architecture is displayed. These are both dedicated to the Chang-ti, but under different titles; in the one he is adored as the *eternal spirit*; in the other, as the creator and preserver of the world. The ceremonies of the modern sacrifices are greatly multiplied; and nothing can exceed the splendor and magnificence with which these solemnities are performed. Sometimes before the day appointed for the grand ceremony, the monarch, the grandees of the court, and all those whom their employments qualify to assist at the solemnity, prepare

themselves by retirement, fasting, and continence; no audience is given by the emperor, and the tribunals are entirely shut; marriages, funerals, rejoicings, and entertainments of every kind, are then forbidden. At last, on the day appointed, the emperor appears, attended by an innumerable multitude, and his person surrounded by a vast number of princes, lords, and officers, while every part of the temple seems to correspond with the magnificence of the sovereign; all the vases and utensils employed in the sacrifices are of gold, and cannot be applied to any other purpose; even the instruments of music are of enormous magnitude, and never used anywhere else. All this grandeur, however, serves only to display in a more eminent manner the humility and abasement of the monarch during his devotion; at which time he rolls in the dust, and speaks of himself before the *Chang-ti* in terms of the most abject submission and humiliation.

The purity of the ancient Chinese religion has, ¹⁰³ Sect of however, been long contaminated by many idolatrous Tao-ists. and fanatical sects. Among these, one named *Tao-se* was founded by a philosopher called *Lao-kiun* or *Lao-tse*, who was born 603 B. C. He died in an advanced age, leaving to his disciples a book entitled *Tao-te*, being a collection of 5000 sentences. His morality has a great resemblance to that of Epicurus. It consists principally in banishing all vehement desires and passions capable of disturbing the peace and tranquillity of the soul. According to him the care of every wise man ought to be only to endeavour to live free from grief and pain, and to glide gently down the stream of life devoid of anxiety and care. To arrive at this happy state he advises his followers to banish all thoughts of the past, and to abstain from every vain and useless inquiry concerning futurity, as well as all tormenting thoughts of ambition, avarice, &c. It was found by the disciples of this philosopher, however, that all their endeavours to obtain a perfect tranquillity of mind were vain, as long as the thoughts of death intervened; they therefore declared it possible to discover a composition from which drink might be made that would render mankind immortal. Hence they were led to the study of chemistry; and, like the western alchemists, wearied themselves in search of the philosopher's stone, until at last they gave themselves up to all the extravagancies of magic.

The desire of avoiding death, together with the credulity natural to unenlightened minds, quickly produced a number of converts to the sect of *Tao-se*. Magical practices, the invocation of spirits, and the art of foretelling events by divination, quickly diffused themselves over the empire, and the imbecility of the emperors contributed to propagate the deception. Temples consecrated to spirits quickly reared their heads in every corner of the empire; and two of the most celebrated of the sect were authorized to maintain public worship there after the form which had been prescribed by their master. At the same time they distributed, and sold at a dear rate, images of the imaginary spirits with which they had peopled the heavens and the earth. These were, by their command, worshipped as so many deities independent of the Supreme Being; and in like manner, several of the ancient emperors were invoked as gods.

Being patronized by the emperors of several dynasties,

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nasties, this sect became more and more powerful. At last they had the impudence to affix, during the night-time, to one of the gates of the imperial city, a book filled with mystic characters and magical figures. At break of day they informed the emperor of the sudden appearance of this book, and publicly declared that it was fallen from heaven. This trick easily imposed upon the weak prince. He immediately repaired, with a numerous train, to the spot where the sacred volume appeared; and having taken it into his hands in a respectful manner, carried it in triumph to his palace, where he shut it up in a golden box. Another emperor carried his reverence for the sect to such a height of impiety and extravagance, as to order a celebrated *Tao-se* to be publicly worshipped under the name of *Chang-ti*. The sect thus patronized by the princes, and accommodated to the credulity of the vulgar, continued to gain ground in spite of every opposition from the wiser part of the people, and is still very powerful in China. At present they offer up three different victims, a hog, a fowl, and a fish, to a spirit whom they invoke. Various ceremonies, such as howling, drawing fantastical figures upon paper, making a hideous noise with kettles and drums, are used in their incantations; and though it may readily be believed that they are for the most part unsuccessful, yet their credit is still kept up by those cases in which they succeed by accident.

The chief of the *Tao-se* is invested by government with the dignity of grand mandarin, which is enjoyed by his successors: he resides in a sumptuous palace in a town of Kiang-si; and the superstitious confidence of the people attracts an immense number thither from all parts of the empire. Some arrive in order to be cured of diseases, others to get an insight into futurity. The impostor distributes to them small bits of paper filled with magical characters; and the ignorant wretches depart well satisfied, without grudging the expence of their journey, though ever so long.

A still more pernicious and more widely diffused sect is that of the idol *Fo*, which came originally from India. The *Tao-se* had promised to the brother of one of the emperors of China to introduce him to a communication with spirits. The credulous prince having heard of a great spirit named *Fo*, who resided in India, prevailed on his brother to send an embassy thither. On the arrival of the ambassadors, however, they could find only two worshippers of this deity, both of whom they brought to China. Several images of *Fo* were also collected at the same time; and these, together with some canonical books of the Indians, were placed on a white horse, and carried in procession to the imperial city.

This superstition was introduced into China about the 65th year of the Christian æra, and soon made vast progress. One of its principal doctrines is that of the metempsychosis, or transmigration of souls, of which M. Grosier thinks he was the inventor, and that Pythagoras, who travelled into several parts of India, had borrowed the doctrine from him. The account given of him by the bonzes is, that finding himself, at the age of 70, oppressed with infirmities, he called his disciples together, and told them he was unwilling to leave the world without communicating the secret and hidden mysteries of his doctrine; which were, in

short, that all things had proceeded from a vacuum and nothing, and to that they must return. This doctrine produced a corresponding mode of action, or rather of inaction, in those who believed it: for thus the great happiness of man was made to consist in absolute annihilation; and therefore the nearer he could bring himself to this state during life, the happier he was supposed to be.

The common doctrine, however, which admits of a distinction between good and evil, finds more profelytes among the vulgar, whose situation in life will not allow them to spend their time in perpetual idleness. According to this, the righteous will be rewarded and the wicked punished after death. They say also, that the god *Fo* came to save mankind, and to expiate their sins; and that he alone can procure them a happy regeneration in the life to come. Five precepts are likewise inculcated on those who adopt this doctrine: 1. Not to kill any living creature; 2. Not to take away the goods of another; 3. Not to pollute themselves by uncleanness; 4. Not to lie, and, 5. Not to drink wine. Above all, they recommend to them to perform acts of mercy, to treat their bonzes well, build temples, &c.

The doctrine of metempsychosis has introduced into China an infinite number of idols, who are all worshipped on the supposition that the spirit of *Fo* has transmigrated into the animals they represent. These idols, however, seem not to be worshipped with great sincerity; but, like the images of saints in the more superstitious countries of Europe, are beaten and thrown in the dirt when their votaries happen not to obtain their desires, which they impute to the obstinacy or weakness of the idol. Nay, M. Grosier gives an account of one man, who having ineffectually paid a sum of money to the bonzes of a certain idol for the cure of his daughter, brought a formal accusation against the idol himself; and in spite of all that the bonzes could say in its behalf, got its worship suppressed throughout the province.

The bonzes of China are represented as a most avicious and hypocritical race of men, ready to practise every kind of villany, and even to subject themselves to the most intolerable tortures, in order to obtain money from the compassion of the public when they cannot get it in any other way; and an edict of one of the emperors is cited by M. Grosier, by which great numbers of their religious houses were suppressed. In order to perpetuate their sect, they purchase young children, whom they take care to instruct in all the mysteries and tricks of their profession; but excepting this, they are in general very ignorant, and few of them would be able to give any tolerable account of the tenets of their own sect. They are not subject to a regular hierarchy, but acknowledge superiors among them whom they call grand bonzes, who have the first place in all religious assemblies at which they happen to be present: and great profit is derived from certain religious clubs, both of men and women, at which the bonzes are always called to assist. Their wealth is likewise augmented by pilgrimages to certain places where there are temples more or less revered, and where a multitude of absurd ceremonies are performed. These bonzes, as may be easily imagined, are inveterate enemies to the progress of Christianity, telling

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Of the wor-
shippers of
Fo.

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Bad cha-
racter of
the bonzes.

China.

ing the most absurd stories concerning the missionaries ; as that they pluck out the eyes of their converts to construct telescopes with, &c. The literati, however, and the more sensible part of the nation, hold them in the greatest contempt.

106
Ridiculous
supersti-
tion of the
fong-choui.

We shall conclude this detail of the Chinese religion with giving an account of one other superstition which seems peculiar to the nation. It is named *fong-choui*, which signifies wind and water. By this they mean the lucky or unlucky situation of a house, burying-place, &c. If any imprudent person has built a house close to that of a Chinese, in such a manner that the angle formed by its roof flanks the wall or roof of the former house, the proprietor ever after lives in terror of utter ruin and destruction from the malignant influence of that angle. An implacable hatred instantly commences betwixt the two families, and often gives rise to a law-suit, which furnishes matter of discussion for some of the superior tribunals. If no redress can be had at law, however, the Chinese is then reduced to the necessity of erecting, on the top of his house, an enormous image of a dragon, or some other monster, with its mouth gaping towards the angle, and, as it were, threatening to swallow it up ; after which the apprehensions of the proprietor begin to subside, and tranquillity is restored to the family. In this manner the governor of *Kien-tchang* secured himself from the influence of the church of the Jesuits, which, being built on an eminence, overlooked his palace. Not depending, however, entirely on the good offices of his tutelary dragon, he also took the wise precaution of altering his principal apartments, and raising, at the distance of 200 paces from the church, a kind of large facade three stories high. But unluckily the death of his successor was attributed to this facade ; for the mandarin being attacked with a disorder in the breast, which made him spit up a white phlegm, this symptom was thought to be owing to the walls of the facade, which were very white, and which were forthwith painted black. The salutary precaution, however, happened to be taken too late ; for the governor died notwithstanding the black colour of the walls.

“ We should never have done (says M. Grosier), were we to relate all the superstitious ideas of the Chinese, respecting the lucky and unlucky situation of houses, the quarter which doors ought to front, and the plan and day proper for constructing the stoves in which they cook their rice.” But the object on which they employ their greatest care is the choice of the ground and situation for a burying-place. Some quacks follow no other profession than that of pointing out hills and mountains which have an aspect favourable for works of that kind. When a Chinese is persuaded of the truth of such information, there is no sum which he would not give to be in possession of the fortunate spot. The greater part of the Chinese are of opinion that all the happiness and misfortunes of life depend upon the *fong-choui*.

107
Jews and
Mahome-
tans in
China.

A colony of Jews was established in China about the year 206 B. C.; but they are now reduced to a small number of families at Cai-fong, the capital of the province of Honan. The Mahometans have multiplied much more than the Jews. It is above 600 years since they first entered the empire, where they

have formed different establishments. At first their number was augmented only by marriages ; but for some time past they have been more particularly attentive to the extending of their sect and propagating their doctrine. The principal means employed for this purpose are, to purchase a great number of children brought up in idolatry, whom their poor parents are glad to part with ; and these they circumcise, and afterwards instruct in the principles of their religion. During the time of a famine which desolated the province of Chang-tong, they purchased more than 10,000 of these children ; for whom, when grown up, they procured wives, built houses, and even formed whole villages of them. They are now become so numerous, that in the places where they reside they entirely exclude every inhabitant who does not believe in their prophet, and frequent a mosque.

China.

With regard to the manners of the Chinese, they bear no resemblance to those of any other nation ; and, if we may believe their historians, they are the same at this day that they were 4000 years ago. The women are condemned almost to perpetual imprisonment within the precincts of their own houses, and are never seen even by their intended husbands before marriage. He knows nothing of her looks or person, but from the account of some female relation or confidant, who in such cases acts the part of match-maker ; though if imposed upon either with regard to her age or figure, he can have recourse to a divorce. The same matrons who negotiate the marriage, also determine the sum which the intended husband must pay to the parents of the bride : for in China a father does not give a dowry to his daughter ; it is the husband who gives a dowry to the wife. When the day appointed for the marriage is arrived, the bride is placed in a chair or close palanquin, the key of which is committed to the care of a trusty domestic, who must deliver it to none but the husband. The latter, richly dressed, waits at his gate for the arrival of the procession. As soon as it approaches, the key is put into his hands ; he eagerly opens the chair, and for the first time perceives his good or bad fortune. If he is contented with his new spouse, the bride descends and enters the house, where the marriage is concluded by feasting and merriment as in other countries ; but if the bridegroom is very much disappointed, he suddenly shuts the chair, and sends the bride home to her relations. To get rid of her in this manner, however, costs a sum equal to what he originally gave in dowry to obtain her.

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Cere-
monies of
marriage.

The Chinese women, even of the first rank, seldom quit their apartment, which is situated in the most retired part of the house, and in which they are secluded from all society but that of their domestics. The book of ceremonies requires that there should be two apartments in every house ; the exterior one for the husband, the interior for the wife. They must even be separated by a wall or wooden partition, the door of which is carefully guarded ; nor is the husband at liberty to enter the wife's apartment, or she to quit it, without sufficient reason. According to the same book, the prattling and loquacity of a woman are reckoned sufficient grounds for a divorce. If this be founded in fact, the women of China are either unexampled for taciturnity, or else multitudes of divorces must be daily occurrences. A woman, however, cannot be divorced

on

China. on any account, if she loses her parents after marriage, or if she has worn three years mourning for the loss of her husband, father, or mother.

A widow of any rank above the common, who has children, seldom enters a second time into the marriage state, though those of the ordinary rank generally do. The poorer sort are not at liberty to follow their own inclination, but are sold for the behoof of the parents of the deceased. As soon as the bargain is concluded, a couple of porters bring a chair, which is guarded by a number of trusty people. In this the widow is shut up, and thus conducted to her new husband.

“Masters (says M. Grosier), for the most part, are very desirous of promoting marriage among their slaves, whatever Mr Paw may say; who, without any foundation, has ventured boldly to assert the contrary. They have even very strong motives to induce them to encourage these marriages; the children produced by them are still their slaves; and besides their becoming new property to them, the fathers and mothers are thus more strongly attached to their service.”

109
Concubinage tolerated.

Concubinage is tolerated in China, though not authorized by any law. This privilege is granted only to the emperor, the princes of the blood, and mandarins; and none but the emperor is permitted to have more than one. The common people generally avail themselves of the toleration granted them in this respect, and will have two or three concubines if they can afford it. They are, however, careful to excuse themselves as well as they can to their wives in this respect, pretending only a desire to have many children, and a number of women to attend their wives. Others, desirous of having a male child, while perhaps their lawful wife cannot have any, take a concubine for this reason only, and dismiss her as soon as their wishes are accomplished: they then permit her to marry whom she pleases, and frequently even provide a husband for her themselves. These concubines are almost all procured from two cities named *Yang-tcheou* and *Sou-tcheou*, where they are educated, and taught singing, dancing, music, and every accomplishment suitable to women of quality, or which can render them agreeable and pleasing. The greatest part of them are purchased in other places, to be again disposed of; and this is the principal branch of trade carried on by these two cities. Unlawful intrigues are seldom heard of in China. Whoever seduces the wife of another is punished with death; and the same punishment is generally inflicted on the person who debauches a young woman.

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Education of children.

From the accounts we have of the education of children in China, one might be apt to conclude, that, instead of being the ignorant superstitious race already described, they ought to be the most intelligent people in the world. The book of ceremonies directs the education of a child to commence as soon as it is born, and describes exactly the qualities which its nurse ought to have. She must speak little, adhere strictly to truth, have a mild temper, behave with affability to her equals, and with respect to her superiors. The child is taught to use the right hand as soon as it can put its hand to its mouth, and then it is weaned. At six years of age, if a male, he is taught the numbers most in use, and made acquainted with the names of the principal parts of the world; at seven, he is sepa-

rated from his sisters, and no longer allowed to eat with them, nor to sit down in their presence; at eight, he is instructed in the rules of good breeding and politeness; at nine, he studies the kalendar; at ten, he is sent to a public school, where he learns to read, write, and cast accounts; from 13 to 15 he is taught music, and every thing that he sings consists of moral precepts. It was formerly the custom, that all the lessons designed for the Chinese youth were in verse; and it is to this day lamented, that the same custom is not followed, as their education has since been rendered much more difficult and laborious.

At the age of 15, the Chinese boys are taught to handle the bow and arrow, and to mount on horseback; at 20 they receive the first cap, if they are thought to deserve it, and are permitted to wear silk dresses ornamented with furs; but before that period they are not allowed to wear any other thing than cotton.

Another method of initiating children into the principles of knowledge in this empire is, by selecting a number of characters expressive of the most common objects, engraving or painting them separately on some kind of substance, and, under the thing represented, putting the name, which points out to them the meaning of the word.

As the Chinese have no proper alphabet, they represent almost every thing by different characters. The labour of their youth, therefore, is intolerable; being obliged to study many thousand characters, each of which has a distinct and appropriate signification. Some idea of their difficulties may be obtained from what we are told by F. Martini, who assures us, that he was under the necessity of learning 60,000 different characters before he could read the Chinese authors with tolerable ease.

The book first put into the hands of the Chinese children is an abridgement, which points out what a child ought to learn, and the manner in which he should be taught. This volume is a collection of short sentences, consisting of three or four verses each, all of which rhyme; and they are obliged to give an account in the evening of what they have learned in the day. After this elementary treatise, they put into their hands the four books which contain the doctrines of Confucius and Mencius. The sense and meaning of the work is never explained to them until they have got by heart all the characters, that is to say, the *words* in the book; a method no doubt inconceivably disgusting, and calculated utterly to destroy the genius of a boy, if he has any. While they are getting these characters by heart, indeed, they are likewise employed in learning to form them with a pencil. For this purpose they are furnished with large leaves of paper, on which are written or printed with red ink very big characters; and all they are required to do is to cover those red characters with black ink, and to follow exactly their shape and figure; which insensibly accustoms them to form the different strokes. After this they are made to trace other characters, placed under the paper on which they write. These are black, and much smaller than the other. It is a great advantage to the Chinese literati to be able to paint characters well; and on this account they bestow great pains in forming the hands of young people. This is of the utmost consequence to literary students in the examinations

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nations which they are obliged to undergo before they can be admitted to the first degree. Du Halde gives a remarkable instance, viz. that "a candidate for degrees having, contrary to order, made use of an abbreviation in writing the character *ma*, which signifies a horse, had the mortification of seeing his composition, though in other respects excellent, rejected merely on that account; besides being severely rallied by the mandarin, who told him a horse could not walk unless he had all his legs.

After the scholar has made himself master of the characters, he is then allowed to compose: but the subject of his composition is pointed out to him only by one word. Competitions are likewise established in China, but most of them are of a private nature. Twenty or thirty families, who are all of the same name, and who consequently have only one hall for the names of their ancestors, agree among themselves to send their children twice a month to this hall in order to compose. Each head of a family in turn gives the subject of this literary contest, and adjudges the prize; but this costs him a dinner, which he must cause to be carried to the hall of competition. A fine of about tenpence is imposed on the parent of each scholar who absents himself from this exercise.

Besides these private competitions, every student is obliged to compete at least twice a-year under the inspection of an inferior mandarin of letters, styled *Hio-kouan*. It frequently happens also, that the mandarins of letters order these students to be brought before them, to examine the progress they have made in their studies, to excite a spirit of emulation among them, and make them give such application as may qualify them for any employment in the state. Even the governors of cities do not think it below their dignity to take this care upon themselves; ordering all those students who reside near them to appear before their tribunal once a month: the author of the best composition is honoured with a prize, and the governor treats all the candidates on the day of competition at his own expense. In every city, town and village in China, there are schoolmasters who teach such sciences as are known in that country. Parents possessed of a certain fortune provide masters for their children, to attend and instruct them, to form their minds to virtue, and to initiate them in the rules of good breeding and the accustomed ceremonies, as well as to make them acquainted with the laws and history, if their age will admit. These masters have for the most part attained to one or two degrees among the literati, and not unfrequently arrive at the first employments of the state.

The education of the Chinese women is confined to giving them a taste for solitude, and accustoming them to modesty and silence; and, if their parents are rich, they are likewise instructed in such accomplishments as may render them agreeable to the other sex.

There is little distinction in China between the ordinary dress of men and women. Rank and dignity are distinguished by certain accessory ornaments; and the person would be severely chastised who should presume to assume them without being properly authorized. The dress in general consists of a long vest which reaches to the ground. One part of this vest, viz. that on the left side, folds over the other, and is fastened to the right by four or five small gold or silver but-

tons, placed at a little distance from one another. The sleeves are wide towards the shoulder, growing narrower as they approach the wrist, where they terminate in the form of a horse shoe, covering the hands entirely, and leaving nothing but the ends of the fingers to be seen. Round their middle they wear a large girdle of silk, the ends of which hang down to their knees. From this girdle is suspended a sheath, containing a knife and two of those small sticks which they use as forks. Below this robe they wear a pair of drawers, in summer made of linen, and in winter of satin lined with fur, sometimes of cotton, and in some of the northern provinces of skins. These are sometimes covered with another pair of white taffety. Their shirts are always very short and wide, of different kinds of cloth, according to the season. Under these they wear a silk net to prevent it from adhering to the skin. In warm weather they have their necks always bare; when it is cold, they wear a collar made of silk and sable, or fox's skin, joined to their robe, which in winter is trimmed with sheep skin, or quilted with silk and cotton. That of people of quality is entirely lined with beautiful sable skins brought from Tartary, or with the finest fox's skin, trimmed with sable; and in the spring it is lined with ermine. Above their robe they wear also a kind of fur-tout with wide sleeves, but very short, which is lined in the same manner. The emperor and princes of the blood only have a right to wear yellow; certain mandarins have liberty to wear satin of a red ground, but only upon days of ceremony; in general they are clothed in black, blue, or violet. The common people are allowed to wear no other colours but blue or black; and their dress is always composed of plain cotton cloth.

Formerly the Chinese were at great pains to preserve their hair; but the Tartars, who subdued them, obliged by the Tartars to cut off their hair. This revolution in dress was not effected without bloodshed, though the conqueror at the same time adopted in other respects the laws, manners, and customs of the conquered people. Thus the Chinese are painted as if bald, but they are not so naturally: that small portion of hair which they preserve behind, or on the tops of their heads, is all that is now allowed them. This they wear very long, and plait like a tail. In summer they wear a kind of cap shaped like an inverted cone, lined with satin, and covered with raton or cane very prettily wrought. The top terminates in a point, to which they fix a tuft of red hair, which spreads over it, and covers it to the brim. This hair grows between the legs of a kind of cow, and is capable of taking any colour, especially a deep red. This ornament is much used, and any person who chooses may wear it.

The mandarins and literati wear a cap of the same form as the foregoing, only it is lined with red satin, and covered on the outside with white. A large tuft of the finest red silk is fixed over it, which is suffered to hang down or wave with the wind. People of distinction generally use the common cap when they mount on horseback or during bad weather; being better calculated to keep off rain, and shelter those who wear it from the rays of the sun. For winter they have another cap bordered with sable, ermine, or fox's

China. fox's skin, and ornamented with a tuft of silk like the former. In these fur-trimmings they are very curious, sometimes expending 40 or 50 ounces of silver upon them.

The Chinese people of rank never go abroad without boots made of satin or some other silk, and sometimes of cotton, but always dyed. They have neither heel nor top, and are made to fit the foot with the greatest exactness. When they travel on horseback, however, they have others made of the skin of a cow or horse made very pliable. Their boot-stockings are of silk stuff, quilted and lined with cotton, reaching above the top of their boot, and ornamented with a border of velvet or cloth. In summer they wear a cooler kind, and in their houses a sort of slippers made of silk stuff. The common people are contented with black slippers made of cotton cloth. The fan is also a necessary appendage of the Chinese dress, and is reckoned equally necessary with the boots.

The dress of the women consists of a long robe quite close at top, and long enough to cover even their toes, with sleeves so long that they could hang down upon the ground, did they not take care to tuck them up; but their hands are seldom seen. The colour of their dresses is entirely arbitrary, but black and violet are generally chosen by those advanced in life. The young ladies, like those of Europe, make use of paint to give a bloom to their complexions; but this, though not the same with the kind used in Europe, agrees with it in the effect of soon wrinkling the skin. Their general head-dress consists in arranging their hair in several curls, among which are interspersed small tufts of gold or silver flowers. According to Du Halde, some of them ornament their heads with the image of a fabulous bird, concerning which many stories are told. This is made of copper or silver gilt, its wings extended and lying pretty close to the head-dress, embracing the upper part of their temples, while the long spreading tail forms a kind of plume on the top of the head. Its body is directly over the head, and the neck and bill hang down, the former being joined to the body by a concealed hinge, in order that it may play freely, and move about on the least motion of the head. The whole bird adheres to the head by means of the claws, which are fixed in the hair.

Ladies of quality sometimes wear several of these birds made up into a single ornament, the workmanship of which is very expensive. Young ladies wear also a crown made of pasteboard, the fore part of which rises in a point above the forehead, and is covered with jewels. The rest of the head is decorated with natural or artificial flowers, among which small diamond pins are interspersed. The head-dress of the ordinary class of women, especially when they are advanced in years, consists only of a piece of very fine silk wrapped round their heads.

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Absurd custom of preventing the feet of female infants from growing. All authors agree, that an absurd custom prevails throughout China, of confining the feet of female infants in such a manner that they are never allowed to grow to near their full size. The smallness of their feet is accounted such a valuable beauty, that the Chinese women never think they can pay too dear for it. As soon therefore as a female infant is born, the nurse wraps up its feet in very tight bandages; and this torture must be endured until their feet have ceased to

grow. So prevalent is the force of custom, however, that as the child grows up she voluntarily submits to new tortures, in order to accomplish the purpose more effectually. Thus the Chinese women are deprived almost entirely of the use of their feet; and are scarce able to walk, in the most awkward hobbling manner, for the shortest space. The shoe of a full grown Chinese woman will frequently not exceed six inches.

The Chinese use white as the colour proper for mourning; and though a son cannot wear this while his father and mother are alive, he can use no other for three years after their death; and ever afterwards his clothes must be of one colour. The law has forbidden the use of silks and furs to children: and has even prescribed the time when they are first to wear a cap. This is put upon their heads by the master of ceremonies himself, who addresses them in the following manner: "Consider that you now receive the dress of those who have attained to maturity, and that you cease to be children; renounce, therefore, all childish thoughts and inclinations, assume a grave and serious deportment, apply with resolution to the study of virtue and wisdom, and endeavour to merit a long and happy life." "This ceremony (says M. Grosier), which may appear trifling, is attended with the happiest effects. The Chinese give a kind of importance to every thing which can inspire youth with a taste for morality and a love of good order. It might be useful to mankind at every fixed epocha of their lives to remind them of those new duties imposed by each successive change; but, by uniting the solemnity of a public ceremony to this instruction, it will make a deeper impression, and remain much longer imprinted on their memories."

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Excessive ceremoniousness of the Chinese. Nothing can appear more irksome to an European than the multitude of ceremonies used on all occasions by the Chinese. An invitation to an entertainment is not supposed to be given with sincerity until it has been renewed three or four times in writing. A card is sent on the evening before the entertainment, another on the morning of the appointed day, and a third when every thing is prepared and the guests ready to sit down to the table. The master of the house always introduces his guests into the hall, where he salutes them one after another. He then orders wine to be brought him in a small cup made of silver, porcelain, or precious wood, and placed upon a small varnished salver. He lays hold of it with both his hands, makes a bow to all the surrounding guests, and advances towards the fore part of the hall, which generally looks into a large court. He there raises his eyes and the cup towards heaven; after which he pours the wine on the ground. He afterwards pours some wine into a silver or porcelain cup, makes a bow to the most considerable person in company, and then goes to place the cup on the table before him; for in China every guest has a table for himself. The person for whom he intends this honour, however, generally saves him the trouble of placing the cup; calls for wine in his turn, and offers to place the cup on the master's table, who endeavours to prevent him, with a thousand apologies and compliments according to the rules of Chinese politeness. A superior domestic conducts the principal guest to an elbow-chair covered with rich flowered silk, where the stranger again begins his compliments,

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pliments, and begs to be excused from sitting in such an honourable seat, which nevertheless he accepts of; and all the rest of the guests do the same, otherwise the ceremonial would be gone through with each of them. The entertainment is concluded by some theatrical representations, accompanied with the music of the country; which, however, would give but little pleasure to an European. Besides the guests, a certain number of people are admitted into the court in order to behold these theatrical representations; and even the women are allowed to view them through a wicket, contrived so that they may behold them without being seen themselves.

The entertainments of the Chinese are begun, not by eating, but by drinking; and the liquor they drink must always be pure wine. The intendant, or *maitre d'hotel*, falling down on one knee, first invites the guests to take a glass; on which each of them lays hold with both hands of that which is placed before him, raising it as high as his forehead, then bringing it lower down than the table, and at last putting it to his mouth: they all drink together, and very slowly, taking three or four draughts. While they are drinking, the dishes on each of the tables are removed, and others brought in. Each of the guests has twenty-four set before him in succession; all of them fat, and in the form of ragouts. They never use knives in their repasts; and two small pointed sticks, ornamented with ivory or silver, serve them instead of forks. They never begin to eat, however, until they are invited by the *maitre d'hotel*; and the same ceremony must be gone through every time they are going to take a cup of wine, or begin a new dish. Towards the middle of the entertainment the soup is brought in, accompanied with small loaves or meat pies. These they take up with their small sticks, steep them in the soup, and eat them without waiting for any signal, or being obliged to keep time with the rest of the guests. The entertainment, however, continues in other respects with the utmost formality until tea is brought in; after which they retire from table and amuse themselves in another hall, or in the garden, for a short time, until the dessert be brought in. This, like the entertainment itself, consists of 24 dishes, which are made up of sweetmeats, fruits differently prepared, hams and salted ducks which have been baked or dried in the sun, with shell and other kinds of fish. The same ceremonies which preceded the repast are now renewed, and every one sits down at the same place he occupied before. Larger cups are then brought in, and the master invites the guests to drink more freely.

These entertainments begin towards evening, and never end till midnight. A small sum of money is given to the domestics; when every one of the guests goes home in a chair preceded by several servants, who carry large lanthorns of oiled paper, on which are inscribed the quality, and sometimes the name, of the master. Without such an attendance they would be taken up by the guard; and the day following they never fail to return a card of thanks to the officer.

Their method of drinking tea is not like that of other nations. A small quantity of bohea, sufficient to tinge the water and render it palatable (for they

drink no green), is taken in the morning, and thrown into a vessel adapted to the number in family. This stands till milk-warm; in which state it is kept the whole day, and a cup drank now and then without sugar or milk, in order to exhilarate the spirits when exhausted by fatigue: and if a stranger call by accident, or a visitor by appointment, the first thing presented, after the usual ceremonies of meeting, is a very small pipe filled with tobacco of their own growth, and a cup of the tea already mentioned, or of some fresh made of better quality, together with sweetmeats, &c. Tea is the daily beverage in China, and is drank by all ranks of people.

Some change has been made in the ceremonial of the Chinese by the Tartar conquest, and some new dishes also introduced by the same means; and here M. Grosier observes, that the Tartars are much better cooks than the Chinese. All their dishes are highly seasoned; and by a variation in the proportions of their spices, they are able to form a variety of dishes out of the same materials. None of their viands, however, are more esteemed than stags sinews, and the nests of a particular species of birds, which have the property of giving a most agreeable relish to whatever is mixed with them. Other dishes are introduced at these repasts, which would be accounted very disagreeable with us; such as the flesh of wild horses, the paws of a bear, and the feet of several wild animals. The greater part of these provisions are brought preserved in salt from Siam, Camboya, and Tartary.

The wines of China have no resemblance to ours either in taste or quality, being procured from rice, and not from the vine. A particular kind of rice is employed for making them, and the grain is steeped for 20 or 30 days in water, into which ingredients of a different nature are successively thrown: they afterwards boil it; and as soon as it becomes dissolved by the heat, it immediately ferments, and throws up a vaporous scum not unlike new wine. A very pure liquor is found under this scum, which is drawn off and put into vessels well glazed: From the remaining leys an inflammable spirit is made, little inferior, and sometimes even superior, to the European. Another kind of wine is used by the Chinese, or rather Tartars, called *lamb wine*. It is very strong, and has a disagreeable smell; and the same may be believed of a kind of spirit distilled from the flesh of sheep; though this last is sometimes used by the emperors.

These entertainments exceed the bounds of ordinary repasts; the Chinese being naturally sober, and those in easy circumstances living chiefly on pork; for which reason a great number of hogs are bred in the country. Their flesh is much easier of digestion, and more agreeable to the taste, than those of Europe. The Chinese hams are in high estimation. The common people live very poorly; being satisfied, in time of scarcity, with the flesh of dogs, horses, cats, and rats, which last are sold publicly in the streets.

There are several public festivals annually celebrated in China. One is that already mentioned, in which the emperor tills the ground with his own hands. This is also celebrated on the same day throughout the empire. In the morning the governor of every city comes forth

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forth from his palace crowned with flowers, and enters his chair amidst the noise of different instruments which precede it; a great number of people attending, as is usual on all such occasions. The chair is surrounded by litters covered with silk carpets, on which are represented either some illustrious persons who have supported and encouraged agriculture, or some historical painting on the same subject. The streets are hung with carpets, triumphal arches are erected at certain distances, lanterns everywhere displayed, and all the houses illuminated. During the ceremony a figure resembling a cow, made of baked earth, with gilt horns, is carried in procession, and of such enormous magnitude that 40 men are scarce sufficient to support it. A child follows with one foot naked and the other shod, who is called the *spirit of labour and diligence*, and keeps continually beating the image with a rod to make it advance. Labourers, with their implements of husbandry, march behind; and the procession is closed by a number of comedians and people in masks. The governor advances towards the eastern gate, and returns in the same manner. The cow is then stripped of its ornaments, a prodigious number of earthen calves taken from its belly and distributed among the people; after which the large figure is broken in pieces and distributed in the same manner. The ceremony is ended by an oration in praise of agriculture, in which the governor endeavours to excite his hearers to the practice of that useful art.

Other two festivals are celebrated in China with still more magnificence than that above described. One of them is at the commencement of the year; the other is called the *feast of lanterns*. During the celebration of the former, all business, whether private or public, is suspended, the tribunals are shut, the posts stopped, presents are given and received, and visits paid. All the family assemble in the evening, and partake of a feast to which no stranger is admitted; though they become a little more sociable on the following day.

The feast of lanterns ought to take place on the 15th day of the first month, but usually commences on the evening of the 13th, and does not end till that of the 16th. At that time every city and village, the shores of the sea, and the banks of all the rivers, are hung with lanterns of various shapes and sizes; some of them being seen in the courts and windows of the poorest houses. No expence is spared on this occasion; and some of the rich people will lay out eight or nine pounds sterling on one lantern. Some of these are very large, composed of six wooden frames either neatly painted or gilt, and filled up with pieces of fine transparent silk, upon which are painted flowers, animals, and human figures; others are blue, and made of a transparent kind of horn. Several lamps, and a great number of wax candles, are placed in the inside: to the corners of each are fixed streamers of silk and satin of different colours, with a curious piece of carved work on the top. They are likewise acquainted with our magic lantern, which they sometimes introduce in this festival. Besides this, they have the art of forming a snake 60 or 80 feet in length, filled with lights from one end to the other; which they cause twist itself into different forms, and move about

as if it were a real serpent. During the same festival all the varieties of the Chinese fire-works, so justly admired, and which, some time ago at least, surpassed every thing of the kind that could be done in Europe, are exhibited.

Every public ceremony in China is carefully rendered as striking as possible. A viceroy never quits his palace but with a royal train, dressed in his robes of ceremony, and carried in a chair elegantly gilt, which is borne upon the shoulders of eight domestics; two drummers marching before the guards, and beating upon copper basons to give notice of his approach. Eight other attendants carry standards of wood varnished, upon which are inscribed in large characters all his titles of honour. After these come 14 flags with the symbols of his office; such as the dragon, tyger, phoenix, flying tortoise, &c. Six officers follow, each bearing a piece of board in shape like a large shovel, on which are written in large golden characters the qualities of the mandarin himself: two others carry, the one a large umbrella of yellow silk, and the other the cover in which the umbrella is kept. The first guards are preceded by two archers on horseback; the latter are followed by others armed with a kind of weapons composed of hooked blades, fixed perpendicularly to long poles ornamented with four tufts of silk, placed at a small distance above one another. Behind these are two other files of soldiers, some of whom carry large maces with long handles; others iron maces in the shape of a snake; others are armed with huge hammers; while those behind them carry long battle-axes in the form of a crescent: others follow, who have battle-axes of another kind; and behind these are some with the hooked weapons already described.

Behind these come soldiers armed with triple-pointed spears, arrows, or battle-axes; having in front two men who carry a kind of box containing the viceroy's seal. Then come two other drummers to give notice of his approach. Two officers follow, having on their heads felt hats, adorned with plumes of feathers, and each armed with a cane to recommend regularity and good order to the surrounding multitude. Two others bear maces in the form of gilt dragons. These again are followed by a number of magistrates and officers of justice: some of whom carry whips or flat sticks, while others have chains, hangers, and silk scarfs. Two standard-bearers and a captain command this company, which immediately precede the governor. His chair is surrounded by pages and footmen, and an officer attends him who carries a large fan in form of a screen: he is followed by several guards differently armed, together with ensigns and other officers, who are also followed by a great number of domestics all on horseback, carrying various necessaries for the use of the mandarin. If he marches in the night-time, instead of flambeaux, as are customary in Europe, large lanterns, exceedingly pretty, are carried before him; on the transparent part of which are written, in very conspicuous characters, his quality, titles, and rank, as mandarin. These are also intended to give notice to the passengers to stop, and to those who are sitting to rise up with respect; for whoever neglects either the one or the other is sure to receive a severe bastinading.

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Magnificence of the viceroys.

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The emperor marches with still more magnificence, in proportion to his superior quality. The trumpets used in his procession are about three feet long, eight inches in diameter at the lower extremity, and pretty much resembling a bell in shape: their sound is peculiarly adapted to that of the drums. His cavalcade is closed by 2000 mandarins of letters, and as many of arms. Sometimes the great mandarins, as well as the emperor, travel in barks: their attendance is then somewhat different, but the magnificence almost the same. The honours paid to a viceroy who has governed a province with equity are exceedingly great on his departure from it. He has scarcely left the capital of the province when he finds on the highway, for the space of two or three leagues, tables ranged at certain distances, each of which is surrounded with a long piece of silk that hangs down to the earth. On these wax candles are placed even in the open day; perfumes are burnt upon them; and they are loaded with a profusion of victuals and various kinds of fruit, while tea and wine are prepared for him on others. The people throw themselves on their knees as he passes, and bow their heads even to the earth; some shed tears, or pretend to do so; some present him with wine and sweetmeats; others frequently pull off his boots and give him new ones. These boots, which he has perhaps used only for a moment, are considered as a valuable monument: those first taken off are preserved in a cage over the gate of the city; the rest are carefully kept by his friends.

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disposition
of the Chi-
nese.

Hitherto our author, M. Grosier, has seemed inclined to give a favourable idea of the Chinese, and to cause us look upon them as many degrees superior to ourselves in the practice of virtue and morality; but when he comes to give an account of their dealings in trade, he is then obliged to confess that they are as dishonest and knavish a race as any that exist. "The most frequented fairs of Europe (says he) afford but a faint idea of that immense number of buyers and sellers with which the large cities of China are continually crowded. We may almost say, that the one half are employed in over-reaching the other. It is, above all, against strangers that the Chinese merchants exercise, without any sense of shame, their insatiable rapacity. Of this F. du Halde gives a striking example, which might be supported by many others: 'The captain of an English vessel bargained with a Chinese merchant at Canton for several bales of silk, which the latter was to provide against a certain time. When they were ready, the captain went with his interpreter to the house of the Chinese merchant to examine whether they were found and in good condition. On opening the first bale, he found it according to his wish, but all the rest were damaged and good for nothing. The captain on this fell into a great passion, and reproached the merchant in the severest terms for his dishonesty. The Chinese, after having heard him for some time with great coolness, replied, 'Blame, Sir, your knave of an interpreter: he assured me that you would not inspect the bales.

"The lower class of people are, above all, very dexterous in counterfeiting and adulterating every thing they sell. Sometimes you think you have bought a capon, and you receive nothing but skin; all the rest has been scooped out, and the place so ingeniously filled,

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that the deception cannot be discovered till the moment you begin to eat it. The counterfeit hams of China have been often mentioned. They are made of a piece of wood cut in the form of a ham, and coated over with a certain kind of earth which is covered with hog's skin. The whole is so curiously painted and prepared, that a knife is necessary to detect the fraud. Mr Ofbeck relates, that having one day observed a blind man carrying about for sale some of those trees called by the Chinese *Fokei*, he purchased one, which to appearance had fine double red and white flowers; but on closer examination, he found that the flowers were taken from another tree, and that one calyx was so neatly fitted into the other, with nails made of bamboo, that he should scarcely have discovered the deceit had not the flowers begun to wither. The tree itself had buds, but not one open flower.

"The robbers in China signalize themselves also by their dexterity and ingenuity which they display in their profession. They seldom have recourse to acts of violence, but introduce themselves into a house either privately or by forming some connection with the family. It is as difficult in China to avoid robbery as it is to apprehend the criminal in the fact. If we are desirous of finding among the Chinese openness of temper, benevolence, friendship, and, lastly, virtue, we must not seek for it in cities, but in the bosom of the country, among that class of men who have devoted themselves to labour and agriculture. A Chinese rustic often discovers moral qualities which would add a lustre to the character of men of the most exalted rank. It appears that rural life naturally inspires sentiments of benevolence; by continually receiving the gifts of nature, the mind is enlarged, and men are insensibly accustomed to diffuse them to those around them."

The internal commerce of China is much greater than that of all Europe; but its foreign trade is by no means equal to that of any of the grand European powers. Its internal commerce is greatly facilitated by the vast number of canals and rivers with which the country is intersected. The Chinese, however, are not at all fitted for maritime commerce: Few of their vessels go beyond the straits of Sunda; their longest voyages to Malacca extended only as far as Acheen, towards the straits of Batavia, and northward to Japan.

Their commerce with the last mentioned island, considering the article of exchange, which they procure at Camboya or Siam, produces them cent. per cent. Their trade with the Manillas brings only about 50 per cent. Their profit is more considerable about Batavia; and the Dutch spare no pains to invite them to traffic at their settlements. The Chinese traders go also, though not very frequently, to Acheen, Malacca, Thor, Patan, and Ligor, belonging to Siam and Cochinchina; from whence they bring gold and tin, together with some objects of luxury for the table. A great obstacle to the foreign commerce of the Chinese is their indifference about maritime affairs, and the bad construction of their vessels. This they themselves acknowledge; but say, that any attempt to remove it would be derogating from the laws, and subverting the constitution of the empire.

The burying-places in China are always situated at

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Burying-
places de-
scribed.

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a small distance from a city or town, and generally upon some eminence, having pines or cypresses usually planted around them. The form of the tombs is various according to the different provinces, and the situation of those for whom they are intended. The coffins of the poor are placed under a shade covered with thatch, or inclosed in a small building of brick in the form of a tomb. The tombs of the rich are shaped like a horse-shoe, well whitened, and finished with great taste; but those of the mandarins and people of quality are much more sumptuous and elegant. A vault is first constructed, in which the coffin is shut up; over this vault is raised a pyramid of earth well beat together, about 12 feet in height and 10 in diameter. A layer of lime and sand laid over this earth makes a kind of plaster, which renders the whole very durable and solid; various kinds of trees being planted around it in regular order. Before it is placed a large and long table of white marble, on the middle of which is set a censer, accompanied with two vases, and the same number of candlesticks of exquisite workmanship. Besides this a great number of figures, representing officers, eunuchs, soldiers, saddled horses, camels, lions, tortoises, &c. are ranged round the tombs in different rows; which, F. du Halde assures us, produce a very striking effect.

When a Chinese dies in a province in which he was not born, his children have a right, nay it is their indispensable duty, to transport the body to the burying-place of their ancestors. A son, who should be wanting in this respect, would be disgraced, and his name never placed in the hall of his ancestors. This is a vast building, considered as common to all the branches of the same family, and to which they all repair at a certain season of the year. Sometimes they amount to seven or eight thousand persons, whose fortune, dignity, and rank in society, are all very different; but there no distinction of rank is known; age only gives precedence, and the oldest always takes place of all the rest, though he should be the poorest in the company. The distinguishing ornament of this hall is a long table set against the wall, upon which is generally seen the image of one of their ancestors, who has filled some office of distinction in the empire with honour to himself, or who has been rendered illustrious by his talents and abilities. Sometimes it only contains the names of men, women, and children belonging to the family inscribed upon tablets, together with their age, the day of their death, and the dignities they enjoyed at that time. These tablets are ranged in two rows upon steps, and are only about a foot high each. In the spring, and sometimes in the autumn, the relations of the deceased repair to this hall, where the only privilege enjoyed by the richest is that of preparing an entertainment, and treating the whole family at their own expence; but they never allow themselves to taste a bit of any thing until an offering has been first made to their ancestors. This does not, however, excuse them from visiting the real tomb of their ancestors once or twice a year, generally in the month of April. At this time they pluck the weeds and bushes from around the tomb, renew their expressions of grief, and conclude by placing upon it wine and provisions, which serve to dine their assistants.

The funeral ceremonies are considered by the Chi-

nese as the most important of any. A few moments after a person has expired, he is dressed out in his richest attire, and adorned with every badge of his dignity; after which is he placed in the coffin. The preparation of a coffin, in which his body may be inclosed after death, is one of the chief objects of attention to a Chinese, during his life, and great expence is often thrown out upon it; inasmuch that the poor will give all they are worth, and the rich expend a thousand crowns, nay, a son will sell himself for a slave in order to purchase a coffin for his father. Sometimes the coffin, when purchased with all this labour and expence, will remain twenty years useless in the family, and is considered as the most valuable piece of furniture in his possession.

The manner of interment is as follows: First they sprinkle some lime in the bottom of the coffin; then they lay the body in it, taking care to place the head on a pillow, and to add a great deal of cotton, that it may remain more steady, and be prevented from shaking. In this manner the body remains exposed seven days; but the time may be reduced to three, if any weighty reason makes it necessary; and, during this interval, all the relations and friends, who are purposefully invited, come and pay their respects to the deceased, the nearest relations even remaining in the house. The coffin is exposed in the hall of ceremony, which is then hung with white, but some pieces of black or violet-coloured silk are here and there interspersed, as well as some other ornaments of mourning. Before the coffin is placed a table, on which stands the image of the deceased, or a carved ornament inscribed with his name; and these are always accompanied with flowers, perfumes, and lighted wax candles.

In the mean time those who enter the hall are accustomed to salute the deceased as if he were still in life. They prostrate themselves before the table, and knock their foreheads several times against the earth; after which they place on the table some perfumes and wax candles provided for the purpose. The salutation which they have made to the deceased is returned by the eldest son accompanied by his brothers. The latter come forth from behind a curtain, which hangs on one side of the coffin, creeping along the ground until they reach the spot where those stand whom they are going to salute; after which, without rising up, they return to the place from whence they came. The women are also concealed behind the same curtain, from whence they every now and then send forth dismal cries.

After a number of ceremonies and invitations, the funeral procession at last commences. A troop of men march in a file, carrying different figures made of pasteboard, and representing slaves, lions, tigers, horses, &c. Others follow, marching in two files; some of which carry standards, some flags or censers filled with perfumes; while melancholy and plaintive airs are played by others on different musical instruments. These musicians immediately precede the coffin, which is covered with a canopy, in form of a dome, of violet-coloured silk; its four corners are ornamented with tufts of white silk very neatly embroidered, and covered at the top with net-work. The coffin is placed on the bottom of this machine, and is carried by 64 men.

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men. The eldest son, clothed in a frock of canvas, having his body bent and leaning on a staff, follows near the coffin; and behind him his brothers and nephews, but none of them clothed in canvas. Then come the relations and friends, all clad in mourning, and followed by a great number of chairs covered with white stuff, which contain the wives and female slaves of the deceased. These make great show of sorrow by their doleful cries; but M. Grosier observes, that, in spite of all they can do, the lamentations of the Chinese are so methodical, that an European would be apt to conclude that they were the effects of art rather than the natural effusions of a mind agitated and oppressed with grief. When they arrive at the burying place, the coffin is deposited in a tomb appropriated for it, not far from which there are tables arranged in different halls, and on which the assistants are entertained with great splendour. The entertainment is sometimes followed by fresh marks of homage to the corpse; but these are often changed into thanks to the eldest son; who, however, answers only by signs. But if the deceased was a grandee of the empire, a certain number of his relations never leave the tomb for a month or two. There they reside in apartments purposely provided for them, and every day renew their marks of grief in company with the children of the deceased. The magnificence of these funeral ceremonies is proportioned to the wealth or dignity of the deceased. That of one of the brothers of the emperor was attended by 16,000 people, each of whom had a particular office assigned him relating to the ceremony.

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Mourning.

Mourning continues in China for three years; and during all this time they are obliged to abstain from the use of flesh and wine; nor can they assist at any entertainment of ceremony, or attend any public assembly. At first they are not even permitted to go abroad; and when they do so they are carried in a chair covered with a white cloth. Sometimes the filial piety of the Chinese is carried to such a length, that they preserve the bodies of their deceased fathers in their houses for three or four years; and those who do so impose also upon themselves a great number of other duties, using no other seat during the day but a stool covered with white serge, and no other bed but a plain mat made of reeds, which is placed near the coffin.

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Diversions
of hunting
and fishing.

According to M. Grosier, the only diversions of the Chinese are those of hunting and fishing, dancing not being practised, and gaming forbidden by law. Fishing is considered by them rather as an object of commerce and industry than amusement. They catch fish by various methods; using nets in their great fisheries, but lines in the private. In certain provinces also they use a certain kind of bird whose plumage greatly resembles that of a raven, but with a much longer bill, very sharp and hooked. This method of fishing is practised in boats, of which great numbers may be seen on the river about sun-rising, with the fishing-birds perched on their prows. These birds are taught to catch fish almost in the same manner that dogs pursue game. The fishermen, after making several turns with their boats, beat the water strongly with one of their oars. This serves as a signal to the birds, who instantly plunge into the water, and diving, swallow as many small fishes as they can, repairing immediately

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afterwards to the boat, and carrying a large one by the middle in their bill. The small ones are prevented from passing into the stomach by a ring placed on purpose to confine its gullet: and thus the fisherman by stroking its neck with the head downwards, makes the bird disgorge all those small fish it has swallowed. When they have done fishing, the rings are taken off, and the birds allowed to feed. When the fish happens to be too large for a single bird, the others have sagacity enough to assist it; one taking it by the tail, another by the head, &c. and thus they transport it to their master.

Another method of fishing, practised only in China, is as follows: They nail a board about two feet in breadth, which is covered with a white shining kind of varnish, upon the edges of a long narrow boat, from one end to the other. This board is placed in such a manner as to slope almost imperceptibly to the water. It is used only in the night-time, and is always turned towards the moon, that the reflection of light from the luminary may increase the splendour of the varnish. The fish in sporting, often mistake this varnished board for water; and endeavouring to throw themselves into it, fall into the boat.

The soldiers have a particular method of fishing with a bow and an arrow; the latter of which is fixed to the bow by a string, both to prevent it from being lost, and to enable them to draw out the fish which the arrow has pierced; others make use of tridents to catch large fish which are sometimes found in the mud.

Besides these diversions, the Chinese have some strolling players, but no regular theatres; they have likewise musicians and singers, but no operas, or indeed any public spectacle worthy of notice.

The language of the Chinese is not only very ancient, but, in M. Grosier's opinion, is still spoken in the most early ages, without any variation. His reasons for this opinion are, 1. We do not perceive in history, nor even in the most fabulous traditions, a single fact tending to occasion any doubt of the language spoken by the ancient Chinese being different from that used at present. 2. China has never changed its inhabitants; and if revolutions have occasioned any mixture of new languages, it appears that the ancient language has always been predominant, and that the new settlers have learned and spoken it, as the Manchew Tartars after their conquest. 3. The most intelligent and discerning of the literati agree, that the first chapters of the *Chou-king* were written under the reign of Yao, 2300 years before Christ; and in these several speeches of the first emperors are related word for word; and it is not probable that the language of these princes was different from that of the historian. 4. A compliment paid to Yao by one of his subjects, with the answer of that prince, are still preserved, as well as two songs composed under the same reign. 5. The most ancient inscriptions in China are all in the language spoken throughout the empire at this day. 7. The Chinese have borrowed nothing from other nations; and their attachment to their own customs, and to antiquity, must undoubtedly be very unfavourable to any innovation. The language spoken by the vulgar, indeed, must have undergone some changes; but these may be accounted trivial, affecting only

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Of the Chinese language.

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only the pronunciation; which indeed appears to be varied in some few instances. It is certain, however, that the Chinese players act theatrical pieces which were written 1000 years ago, and that these are still understood throughout the empire.

The language of China has no alphabet; all the words which compose it consist of one syllable only, and are very few in number. These always remain the same, and continue monosyllables even when two are joined together, being united in the same manner as the French words *bon* and *jour* are united to form *bon-jour*. These monosyllables never form but one sound. When written by an European, they begin with the letters *ch, tch, f, g,* or *j, i, h, l, m, n, g, ng, p, s, ts, v, ou;* the final letters being *a, e, i, o, oi, ou, u, l, n, gn.* The middle of Chinese words consists of vowels and consonants producing only one sound, and pronounced always as monosyllables. The whole primary words of the language are in number only about 330, though some dictionaries make them 484. The sense of these words, however, is varied by the accents and changes of the voice in pronouncing them almost *ad infinitum*. Two principal accents are known in China; the *ping*, that is, *even*, without elevating or depressing the voice. This is divided into *tsing, clear,* and *tcho, obscure;* or rather *open* and *mute*. The accent *tsé* is subdivided into *tchang*, sharp, *kiu*, grave, and *jou*, re-entering. The tone is *chang* when one raises the voice at the end of a word, as when the negative *no* is pronounced with great emphasis and force; it is *kiu* when one depresses the voice with an air of timidity. When the accent is *jou*, the voice is drawn back as it were into the throat; and the aspiration which takes place on certain words beginning with the letters *c, k, p, t,* still adds to these varieties.

By these differences in pronunciation the signification of the words is totally changed: thus the word *tchu* pronounced by lengthening the *u*, and with a clear tone of voice, signifies master or lord: if it is pronounced in an uniform tone by lengthening the *u*, it signifies *bog*: when pronounced lightly and with rapidity, it signifies *kitchen*; and when articulated with a strong voice depressed towards the end, it signifies a *pillar*.

By the conjunction and modification of these different monosyllables, a Chinese can express every thing he has occasion for; and it may be easily seen what variety must result from this art of multiplying words. The Chinese language therefore has words expressive of the smallest variation of circumstance, and which cannot be expressed in the European languages without a circumlocution. Thus instead of the five words, calf, bull, ox, heifer, cow, every time that a cow has a calf she acquires a new name in the language of this empire; and still another when she becomes barren. An ox fed for sacrifice has a particular name, which is changed when he goes to the altar. In like manner, a whole dictionary might be composed of the words that are employed to express the different parts of the emperor's palace, and those that are in a manner consecrated to it; others being employed when the palaces of princes or mandarins are spoken of. Thus the number of their characters are augmented beyond all bounds, so that the greater part of their literati spend all their lives in studying them.

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In the Chinese there are four different languages, 1. The *Kou-ouen*, or classical language. This is not spoken at present, though it is generally believed to have been the language of the early ages. It is so laconic, and the ideas are so crowded, that it is very difficult to be understood; however, the literati, who can read and understand it, are much delighted with it. 2. The *Ouen-tchang* is the language used in compositions where a noble and elevated style is requisite. It is never spoken, but certain sentences and complimentary expressions are sometimes borrowed from it. It approaches near to the laconic brevity and majestic sublimity of the *Kou-ouen*, and is equally proper for every kind of subject, excepting only the ambiguities of metaphysics, and the formal rugged diction used in treating of the abstract sciences.

3. The *Kouan-ha* is the language of the court, of people in office, and of the literati. It admits of synonymous expressions to moderate the brevity of monosyllables; of pronouns and relatives; prepositions, adverbs, and particles; to supply the want of cases, moods, tenses, and numbers, which have place in other languages.

4. *Hiang-tan* is a kind of corrupted language, or provincial dialect, spoken by the lower classes in China; and of which every province, city, and almost every village, has its own. Besides the sense of the words, which is changed in a great variety of places, they are so altered by diversity of pronunciation as to be almost unintelligible.

This language is so absolutely original, that no traces of the most distant relation can be perceived, either in reference to the form of the character, the system on which it appears to have been constructed, or its peculiar idiom, to any other known language to be met with upon the face of the earth. Many attempts indeed have been made by the learned and ingenious, to discover some affinity between it and different languages; but we apprehend without success. Etymological comparisons are often fanciful and strained, and seldom fail to lead to erroneous conclusions. It may indeed be admitted that it is possible to trace a resemblance between the sound of the Chinese language, and those of other nations, yet no art or ingenuity, no *etymological trick*, as Mr Barrow expresses himself, will ever be able to trace any analogy between their written characters, farther than that they are made up of points and lines, which might constitute an affinity between the Chinese and any other language on the face of the earth. It has no alphabetical arrangement, but consists purely of a prodigious number of arbitrary signs, settled by convention, and which have no external affinity to the things they are meant to describe. The ridiculous conjectures often made on this subject by etymologists might be pardoned if they were meant to be satirical, like Dean Swift's antiquity of the English tongue, from which he makes the Hebrew, Greek, and Latin, to be derivatives.

Such is the nature of the Chinese language, that it would be absurd to expect among that people such high attainments in every branch of literature as are to be met with in Europe. In the opinion of some very eminent men, their acquaintance with erudition of any kind was as great 2000 years ago as it is at present, while others are persuaded that they are rather on the decline.

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decline. They pretend indeed, but without adducing any satisfactory proof of its truth, that the monuments of literature were destroyed by the tyrant She-whang-te, 200 years before the Christian era, that succeeding generations might consider him as the first civilized emperor who had swayed the sceptre over that extensive country. The chief works at present among them, which are most valued, studied, and least understood, are the five classics collected by their favourite Cong-foo-tse, 450 years B. C. and which it seems had the good fortune to escape the unlettered fury of She-whang-te. These classics are enumerated by Mr Barrow in the following order.

1. *Shoo-king*. A collection of records and annals of various princes, commencing more than 2000 years B. C.

2. *Shee-king*. Odes, sonnets, and maxims; most of them so abundant in metaphor, and so obscure, that much of the sense is to be made out by the translator.

3. *Ye-king*. The perfect and the broken lines of Fo-shee; the most ancient relick in China, and perhaps the first attempt at written language: now perfectly incomprehensible.

4. *Chung-choo*. Spring and autumn. The history of some of the kings of Loo: the work principally of Cong-foo-tse.

5. *Lee-kee*. Ceremonies and moral duties, a compilation of Cong-foo-tse.

Without a complete change of the Chinese language and a more extensive and friendly intercourse with foreign nations, it is not at all probable that that people will ever rank high for their knowledge of literature.

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writing.

There are five kinds of writing mentioned by the Chinese literati; the most modern of which is a method of tracing out the characters with a pencil. This is difficult, and requires much experience; at any rate, it disfigures the characters greatly, and is therefore only used in the prescriptions of physicians, prefaces to books, and inscriptions of fancy. The tracing of characters with neatness and accuracy, however, as we have already had occasion to observe, is greatly admired in China. They are often preferred to the most elegant painting; and some will give a most exorbitant price for a page of an old book, if it happens to be neatly written. They pay particular attention to well formed characters even in the most common books; and if any of the leaves happen to fall off, will replace them with the greatest attention. To apply them to any vile purpose, tread them under foot, &c. would be reckoned an unpardonable violation of decency and politeness; nay, it often happens, that workmen, such as masons and joiners, dare not tear a printed leaf of paper fixed to the wall.

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Of their
poetry.

Punctuation was not formerly used in China, nor are points as yet employed in works of an elevated style, or such as are to be presented to the emperor. Poetry is seldom an object of attention, though the taste for it seems to be pretty general in China. Their versification has its rules, and is no less difficult than that of other nations. Only the most harmonious, energetic, and picturesque words, are to be employed, and they must always be used in the same sense in which they were used by the ancients. Each verse can con-

tain only a certain number of words; all of which must be ranged according to the rules of quantity, and terminate in rhyme. The number of verses in a strophe is not determined; but they must be uniform, and present the same distribution of rhymes. The small number of poetical expressions contained in the Chinese language has rendered it necessary to extend the poetical license to a great length in this respect. The Chinese poets are allowed to employ a blank verse in every four. They are acquainted with most kinds of poetry in use among us. They have stanzas, odes, elegies, idyls, eclogues, epigrams, satires, and even *bouts rimes*. The common people have also ballads and songs peculiar to themselves. Some of the most distinguished of the literati have even thought it of importance enough to turn the most celebrated maxims of morality, with the rules of civility, into verse. Their poetry is seldom disgraced by any kind of obscenity; and indeed any such thing would be severely punished by government. That severe attention with which every thing tending to corrupt the morals is watched in China, prohibits not only poems of this kind, but likewise romances of all sorts. The police, however, permits such novels as have an useful tendency, and in which nothing is introduced prejudicial to sound morality. Every author who writes against government is punished with death, as well as all those who have had any hand in the printing or distribution of his works.

The arts of making paper and printing have been long known among the Chinese. That kind of paper now in use was first manufactured about 105 years before the Christian era. Before that period they used cloth, and various kinds of silk stuff, instead of paper; and to this day they still preserve a custom of writing the praises of the dead upon large pieces of silk, which are suspended on one side of the coffin, and carried in funeral processions; and of ornamenting their apartments with maxims and moral sentences written in the same manner. In ages still more early, they wrote with a kind of style upon pieces of bamboo, or even upon plates of metal. The first paper was invented by a mandarin. He took the bark of trees, hemp, and old pieces of silk-stuff, boiling them together until they were reduced to a kind of paste, of which he formed his paper; which by degrees was brought to perfection, and the art of whitening and giving it a lustre found out. A great number of different substances are now used in this empire for making paper; such as the bamboo reed, the cotton shrub, the bark of the plant called *kou-chu*, and of the mulberry tree; hemp, the straw of wheat and rice, parchment, the cods of the silk-worm, and several other substances unknown in Europe. In this manufacture the bark of trees and shrubs is used, and the woody substance of the bamboo and cotton tree, after it has been macerated and reduced to a thin paste. Most of the Chinese paper, however, is attended with the disadvantage of being very susceptible of moisture, readily attracts the dust, and worms insensibly get into it: to prevent which inconveniences, it is necessary to beat the books often, and expose them to the sun. That made of cotton is the prettiest, and most used of any. All of them, however, are much softer and smoother than ours; which is absolutely necessary for their method of writing with

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Chinese pa-

China. a pencil, in order that it may run with freedom, which it could not do upon ours. It is formed into sheets of an enormous size; so that it would be no difficult matter to procure from the manufactories of this empire sheets of paper 30 or 40 feet long.

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Ink. The Chinese ink came originally from Corea; and it was not until the year 900, that they hit upon the method of making it to perfection. The best is made in *Hoei-scheou* in the province of *Kiang-nan*; but its composition is a secret, which the workmen conceal not only from strangers, but from their fellow-citizens. When a Chinese has occasion to write, he places upon his table a piece of polished marble, having a cavity at one of its extremities to contain a little water. In this he dips the end of his cake of ink, and rubs it upon the smooth part of the marble; and as he presses more or less strongly, the liquor acquires a deeper or lighter tinge of black. When he has done writing, the stone is carefully washed; for it would be dishonoured by allowing the least spot to remain. The pencils used in writing are commonly made of the fur of a rabbit, and consequently very soft.

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Their method of printing. The Chinese method of printing is exceedingly different from ours; and indeed it would be in a manner impossible to have moveable types for such a number of characters as their language requires. The whole work which they intend to print is therefore engraved upon blocks of wood; and their method of proceeding is as follows. They first employ an excellent writer, who transcribes the whole upon very thin paper. The engraver glues each of the leaves of the manuscript upon a piece of plank made of any hard wood: he then traces over with a graver the strokes of the writing, carves out the characters in relief, and cuts down the intermediate part of the wood. Thus each page of a book requires a separate plank; and the excessive multiplication of these is no doubt a very great inconvenience, one chamber being scarce sufficient to preserve those employed for a single book. The advantages are, that the work is thus free from typographical errors, and the author has no occasion to correct the proofs. Thus also the booksellers in China have a decided advantage over those of Europe, as they are able by this method of printing to throw off copies according to their sale, without running the risk of being ruined by too large an edition. In this method the beauty of the work depends entirely upon the skill of the writer previously employed. The engravers are exceedingly dexterous, and imitate every stroke so exactly, that it is sometimes difficult to distinguish a printed work from one that is only written.

The method of printing in China is not by a press as in Europe, as neither their wooden planks nor their soft paper could sustain so much pressure. They first place the plank level, and then fix it in that position. The printer is provided with two brushes, and with the hardest daubs the plank with ink; and one daubing is sufficient for four or five leaves. After a leaf has been adjusted upon the plank, the workman takes the second brush, which is softer than the former, and of an oblong figure, and draws it gently over the paper, pressing it down a little, that it may receive the ink. The degree of pressure is to be regulated by the quantity

of ink upon the plank: and in this manner one man is able to throw off almost 10,000 copies a-day. The ink used for printing is different from that formerly described, and which is used in writing. The leaves on account of the thinness of the paper, are printed only upon one side; on which account each leaf of a book is double, so that the fold stands uppermost, and the opening is towards the back, where it is stitched. Hence the Chinese books are not cut on the edges, but on the back. They are generally bound in gray pasteboard, which is very neat; and those who wish to have them more elegantly done, get the pasteboard covered with satin, flowered taffety, and sometimes with gold and silver brocade. Their books are neither gilt nor coloured on the edges like ours.

It has been so justly and so frequently observed, that the liberty of the press must ever prove fatal to the existence of tyranny and superstition, that it is a circumstance peculiarly singular to behold the liberty of the press flourishing under a despotic government; yet this is actually the case in China, although its government may be said to be founded on error, and supported by oppression. It was the liberty of the press which accomplished the overthrow of sacerdotal tyranny in many European countries, by enlightening the minds of those who were enslaved. When the art of printing first found its way into England, an intelligent person observed to the abbot of Westminster, "If you don't take care to destroy that machine, it will very soon destroy your trade." It was fortunate, however, for succeeding generations, that neither the abbot nor his sanctified cotemporaries had the penetration to discover the truth of this prediction, else the ages of darkness and superstition would probably have been protracted to the present day.

The art of manufacturing silk, according to the best authorities, was communicated by the Chinese to the Persians, and from them to the Greeks. The art has been known in this empire from the remotest antiquity; and the breeding of silk-worms and making of silk was one of the employments even of the empresses in very early ages.

The most beautiful silk in the whole empire is that of *Tche-kiang*, which is wrought by the manufactories of Nanking. From these are brought all the stuffs used by the emperor, and such as he distributes in presents to his nobility. A great number of excellent workmen are also drawn to the manufactories of Canton by the commerce with Europe and other parts of Asia. Here are manufactured ribbons, stockings, and buttons. A pair of silk stockings here cost little more than 6s. sterling.

The quantity of silk produced in China seems to be almost inexhaustible; the internal consumption alone being incredibly great, besides that which is exported in the commerce with Europe and the rest of Asia. In this empire all who possess a moderate fortune wear silk clothes; none but the lower class of people wearing cotton stuffs, which are commonly dyed blue. The principal stuffs manufactured by them are plain and flowered gauzes, of which they make summer-dresses; damask of all colours; striped and black satins; naped, flowered, striped, clouded, and pinked taffeties; crapes, brocades, plush, different kinds of velvet, and a multitude of other stuffs unknown in Europe. They make particular

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vast quantity of silk produced.

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particular use of two kinds; one named *touan-tse*, a kind of satin much stronger, but which has less lustre, than that of Europe; the other a kind of taffety, of which they make drawers and linings. It is woven exceedingly close, and is yet so pliable that it may be rumpled and rubbed between the hands without any crease; and even when washed like cotton-cloth, it loses very little of its lustre. They manufacture also a kind of gold brocades, but of such a slight nature, that they cannot be worn in clothes: they are fabricated by wrapping fine slips of gilt paper round the threads of silk.

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Porcelain.

Porcelain is another great branch of Chinese manufacture, and employs a vast number of workmen. The finest is made in a village called *King-te-ching* in the province of *Kiang-si*. Manufactories have also been erected in the provinces of Fo-kien and Canton, but their produce is not esteemed: and one which the emperor caused to be erected at Peking, in order to be under his own inspection, miscarried entirely.

The Chinese divide their porcelain into several classes, according to its different degrees of fineness and beauty. The whole of the first is reserved for the use of the emperor, so that none of it ever comes into the hands of other persons, unless it happen to be cracked or otherwise damaged in such a manner as to be unworthy of being presented to the sovereign. Among that sent to the emperor, however, there is some porcelain of an inferior quality, which he disposes of in presents. There is some doubt, therefore, whether any of the finest Chinese porcelain was ever seen in Europe. Some value, however, is now put upon the European porcelain by the Chinese themselves.

131
Glasses of
little estimation.

The use of glass is very ancient in China, though it does not appear that great value was ever put upon this kind of ware, the art of manufacturing it having been frequently lost and revived again in this empire. They greatly admire the workmanship of the European crystal, but prefer their own porcelain, which stands hot liquors, and is much less liable to be broken. The little estimation in which this substance was held, is even mentioned by their own writers in speaking of the false pearls, mirrors, and other toys which were made in former ages. The remembrance of a very large glass vessel, however, which was made in 627, is still preserved; and of which it was said that a mule could as easily enter it as a gnat could enter a pitcher. In order to transport this monstrous vessel from the place where it was manufactured to the emperor's palace, it was necessary to inclose it in a net, the four corners of which were fixed to four carriages. The same indifference with regard to glass is still entertained by the present emperors; however, a glass-house is established at Peking, where a number of vases and other works are made; and these are so much the more difficult in the execution, as none of them are blown. This manufactory, as well as many others, is considered only as an appendage of the court, destined for the purposes of pomp and magnificence.

132
Medicine.

It seems evident that medicine must have been one of the earliest studies to which mankind turned their attention, at least when they had attained to some degree of civilization. It is the common lot of humanity to be born to trouble as the sparks fly upward, and therefore an assiduous application to the study of those diseases

to which man is subject, either with a view to effect a radical cure, or even to mitigate the virulence of their symptoms, must have secured to such characters the esteem and admiration of the world. Even savages have discovered respect for such of their own nation as could remove obstructions, heal bruises, or administer relief to the miserable in any shape whatever. The Chinese in this respect are perfectly unique, and seem to differ from every nation under heaven in their notions of medicine. They have no public seminaries where the healing art may be taught, because they do not consider the knowledge of any branch of medicine as in the smallest degree necessary. The very best performances of this nature to be met with in China, are little more than mere enumerations of the names and supposed qualities of different plants,—a sufficient stock of knowledge for constituting a Chinese physician. In a country where the people are so credulous, and the medical art at such a low ebb, it would be a singular circumstance to find no quacks. In every city, therefore, of this vast empire, multitudes are to be met with continually vending nostrums, as pretended specifics for some disease or other, and the easy credulity of the people affords them a comfortable subsistence.

Were the Chinese perpetual strangers to every species of disease, it would enable us to account for their unnatural apathy or indifference about the study of physic; but it will remain an inexplicable paradox, when we are assured upon undoubted authority, that they are subject to a multiplicity of distempers. The smallpox, ophthalmia, contagious fevers, sometimes the venereal, or Canton ulcer, as it is denominated by themselves, are a few of the maladies incident to the Chinese, which might constitute a powerful stimulus, one would imagine, to the study of physic, with unremitting assiduity, which it is certain they do not, as appears from the subsequent assertion of Dr Gregory. "In the greatest, most ancient, and most civilized empire on the face of the earth, an empire that was great, populous, and highly civilized 2000 years ago, when this country was as savage as New Zealand is at present, no such good medical aid can be obtained among the people of it, as a smart boy of 16, who had been but 12 months apprentice to a good and well employed Edinburgh surgeon, might reasonably be expected to afford." This gives us a melancholy picture of the state of medicine in China, which, however, is confirmed by the united testimony of Sir George Staunton and Mr Barrow.

The people of China are said to be in the possession of a method for ascertaining whether a man has been murdered, or committed an act of suicide, of the probability of which our readers will be able to judge from the following process. The body to be examined is washed with vinegar. A large fire is kindled in a pit dug for the purpose, six feet long, three wide, and the same in depth. The fire receives new accession of fuel till the pit acquires the temperature of a heated oven, when the whole of the remaining fuel is taken out, and a large quantity of wine is poured into the pit. The body is then placed at full length on osier twigs over the mouth of it, and covered with a cloth for two hours, that the steam of the wine may act upon the body in all directions. The Chinese, it

is

¹³³ ^{China.} is said, assert that if the blows given the body were so violent as to occasion death, this process makes the marks of them clearly appear, let the state of the body, when subjected to this test, be ever so cadaverous.

¹³³
Of their
music.

With regard to the music of the Chinese, we have the same stories related as of the Greeks and Egyptians, viz. that in former ages the musicians could make brute animals leap at the sound of their instruments. Our author, M. Grosier, indeed, does not quote any Chinese author who asserts that the ancient music could make trees dance, or stones arrange themselves into a city; but he quotes them, asserting, "that the musicians could call down superior spirits of every age from the ethereal regions; raise up the manes of departed beings; inspire men with a love of virtue; and lead them to the practice of their duty." Effects of this supernatural kind are attributed to the sacred music by the inspired writers; as in the case of Saul, out of whom an evil spirit departed at the sound of David's harp; and of Elisha, who was inspired with the spirit of prophecy at the sound of a musical instrument. It is probable, therefore, that the relations both of the Greeks and Chinese are founded upon facts of this kind; and we cannot from thence infer, that the music of early ages was at all superior to that which followed. According to those who have employed much time in these researches, the ancient Chinese were acquainted with the division of the octave into twelve semitones; and that before the time of Pythagoras, or even Mercury himself: that the lyre of Pythagoras, his invention of the diatonic tetrachords, and the formation of his grand system, were merely borrowed from the ancient Chinese. In short, it is maintained, that the Greeks, even Pythagoras himself, did nothing but apply to strings that theory which the Chinese had before formed, and applied to pipes.

At present the Chinese are not acquainted with the use of our musical notes; they have not that diversity of signs which distinguish the different tones, and the gradual elevation or depression of the voice, nor any thing to point out the various modifications of sound to produce harmony. They have only a few characters to mark the principal notes; and all the airs they learn are repeated merely by rote. The emperor Kang-hi was therefore greatly astonished at the facility with which an European could catch and remember an air the first time he heard it. In 1679 he sent for Fathers Grimaldi and Pereira, to play some tunes on the harpsichord, of which they had before made him a present. He was greatly entertained with their music, but altogether astonished when he found that F. Pereira could take down a Chinese air while the musicians were playing it, and then repeat the whole without omitting a single note. Having made several trials of this kind in order to satisfy himself, he bestowed the highest encomiums upon the European music, and the means furnished by it to facilitate and lessen the labour of the memory. "I must confess (says he) that the European music is incomparable, and that the like of this F. Pereira is not to be found in my whole kingdom."

¹³⁴
Musical in-
struments.

The Chinese have always distinguished eight different sounds; and they believe that nature, in order to

produce these, formed eight different kinds of sonorous bodies. The order in which they distribute these sounds, and the instruments they have contrived to produce them, are, 1. The sound of skin produced by drums; 2. That of stone produced by the *king*; 3. The sound of metal by bells; 4. That of baked earth by the *huien*; 5. Of silk by the *kin* and *che*; 6. Of wood by the *yu* and *tehou*; 7. Of the bamboo by the *koan*, and different flutes; 8. That of a gourd by the *cheng*.

^{China.}

The drums were originally composed of a box made of baked earth, and covered at the extremities with the skin of some animal; but on account of the brittleness of baked earth, wood was soon substituted in its stead. Greater part of these instruments are shaped like our barrels, but some are cylindrical.

The instruments formed of the sonorous stones are called *king*, distinguished into *se-king* and *pien-king*. The *se-king* consists only of one stone, and therefore produces only one note. The *pien-king* consists of 16 stones suspended together, and thus forming an instrument capable of producing all the tones admitted into the music of the ancient Chinese. They are cut into the form of a carpenter's square; their tone is flattened by diminishing their thickness, and is made sharper by abridging their length.

Although in the estimation of the Chinese, universal nature has been forced to contribute towards the perfection of their music, by furnishing them with the skins of different animals, metals, stones, baked earths, and the fibrous parts of plants, Mr Barrow could discover no instrument among them of a musical nature, the tones of which would have been even tolerable to a delicate European ear; and only one person in the course of his investigations and researches could with any propriety be said to sing from tenderness and feeling. Yet without the smallest authority for such a bold assertion, a certain Jesuit has maintained, that the musical system of the Chinese was borrowed from them by the Greeks and Egyptians before the time of Orpheus? He who can believe this extravagant assertion, after comparing the music of these countries together at any given period, will find it an easy matter to give credit to any thing whatever.

The bells in China have always been made of a mixture of tin and copper. They are of different shapes, and those of the ancients were not round but flatted, and in the lower part resembling a crescent. An instrument, corresponding to the *king*, already mentioned, is composed of 16 bells of different sizes. Some of their bells used on public occasions are of enormous magnitudes. One at Peking is described as $13\frac{1}{2}$ feet in diameter, $12\frac{1}{2}$ in height, and 42 in circumference; the weight being upwards of 120,000 pounds. It is used for announcing the hours or watches of the night; and its sound, which is prodigiously loud and strong, has a most awful effect in the night-time, by reverberating round the walls and the echo of the surrounding country. There are several others likewise of vast size in the same city; one of which deserves greatly to be admired on account of the beautiful characters with which it is covered; and which are as neat and perfect as if traced out by the hand of the finest writer, or formed by means of a stamp upon wax. F. le Comte tells us, that in all the cities

¹³⁵

Bells of im-
mense size.

China.

of China there are bells for marking the hours and watches of the night. They generally divide the night into five watches, beginning at seven or eight in the evening. On the commencement of the first they give one stroke, which is repeated a moment after; and thus they continue for two hours till the beginning of the second: they then give two strokes, which are repeated at equal intervals till the beginning of the third watch; and thus they proceed to the fourth and fifth, always increasing the number of the strokes. For the same purpose also they use enormous drums, which they beat in a similar manner. F. Magaillans mentions one at Peking upwards of 40 feet in circumference.

The instrument called *huien*, which is made of baked earth, is highly esteemed by the Chinese on account of its antiquity. It is distinguished into two kinds, the great and small; the former being of the size of a goose's egg; the latter of that of a hen's. It has six holes for the notes, and a seventh for the mouth.

The *kin* and *tcbe* have been known from the remotest antiquity. The *kin* has seven strings made of silk, and is distinguished into three kinds, differing only in size. The body is formed of a kind of wood varnished black, and its whole length about five feet five inches. The *tcbe* is about nine feet in length, has 25 strings, and is divided into 25 kinds. F. Amiot assures us, that we have no instrument in Europe which deserves to be preferred to it.

The instruments which emit the sound of wood are the *tcbou*, the *yu*, and the *tcboung-ton*. The first is shaped like a bushel, and is beat on the inside with a hammer; the second, which represents a tyger squatting, is made to sound by scraping its back gently with a rod; the third is a collection of twelve pieces of boards tied together, which are used for beating time, by holding them in the right hand, and knocking them gently against the palm of the left.

Many instruments are constructed of the bamboo. These consist of pipes joined together, or separate, and pierced with more or fewer holes. The principal of all these wind instruments is the *cheng*, which emits the sound of a gourd. This is formed by cutting off the neck of a gourd, and reserving only the lower part. To this a cover is fitted, having as many holes as are equal to the number of sounds required. In each of these holes a pipe made of bamboo is fixed, and shorter or longer according to the tone intended. The mouth of the instrument is formed of another pipe shaped like the neck of a goose; which is fixed to the gourd on one side, and serves to convey the air to all the pipes it contains. The ancient *cheng* varied in the number of their pipes; those used at present have only 13.

136
Chinese
painting.

The painting of the Chinese is undoubtedly inferior to that of the Europeans, though we are not by any means to judge of the abilities of the painters of this empire by the performances which are brought to Europe. M. Grosier remarks, that the works of the eminent Chinese painters are never brought to Canton, because they cannot find purchasers among the European merchants. The latter delight only in obscene pictures, which are not permitted by government, nor indeed will any artist of character execute them, though they prevail upon some of the inferior daubers to gratify them in this respect. It seems, however,

China.

to be universally agreed, that the Chinese have no notion of correctness or perspective, and little knowledge of the proportions of the human body, though it cannot be denied that they excel in painting flowers and animals. In these they pride themselves in a scrupulously exact imitation of nature, inasmuch that it is no uncommon thing to hear a painter ask his pupil how many scales there are between the head and tail of a carp.

Painting was formerly much esteemed in China, but has now fallen into disrepute on account of its political inutility. The cabinets and galleries of the emperor, however, are filled with European paintings, and the celebrated artists Castiglioni and Attiret were both employed; but their offer of erecting a school of painting was rejected, lest they should by this means revive the taste for that art which it had been formerly thought prudent to suppress.

Painting in fresco was known in China long before the Christian era; and, like the Grecians, the Chinese boast much of their celebrated painters of antiquity. Thus we are told of a door painted by Fan-hien, which was so perfect an imitation, that the people who entered the temple where it was, attempted to go out by it, unless prevented by those who had seen it before. The present emperor has in his park an European village painted in fresco, which produces the most agreeable deception. The remaining part of the wall represents a landscape and little hills, which are so happily blended with the distant mountains, that nothing can be conceived more agreeable. This was the production of Chinese painters, and executed from designs sketched out for them.

After this account of the state of painting in China, chiefly on the authority of M. Grosier, we beg leave to remark upon the authority of more recent, and seemingly more competent as well as more inquisive observers, that painting in China is at a low ebb, which made a certain artist once exclaim, "These Chinese are fit for nothing but weighing silver, and eating rice." They can copy with tolerable exactness what is laid before them, but so deficient are they in respect to a judicious alternation of light and shade; and therefore without discovering a single symptom of taste, beauties, and defects are alike slavishly imitated. Their supposed excellence in drawing flowers, birds, and insects to the life, is most remarkable in the city of Canton; from which Mr Barrow conjectures that they acquire their eminence by copying the productions of Europe, occasionally sent over to be transferred to the porcelain designed for exportation.

Engraving in three, four, or five colours, is very ancient among the Chinese, and was known in this empire long before its discovery in Europe.

Sculpture is very little known in this empire; nor is there a single statue in any of the squares or public edifices of Peking, not even in the emperor's palace. The only real statues to be met with in the empire are those which, for the sake of ceremonious distinction, are used to ornament the avenues leading to the tombs of princes and men of great rank; or those that are placed near the emperor's coffin, and that of his sons and daughters in the interior part of the vault, where their remains are deposited.

The Chinese architecture is entirely different from that of Europe.

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Engra-
ving.

138

Sculpture.

139

Architec-
ture.

China.

that of the Greeks or Romans; but nevertheless has certain proportions of its own, and a beauty peculiar to itself. The habitations of the emperor are real palaces, and announce in a striking manner the majesty and grandeur of the master who inhabits them. All the missionaries who had access to the inside of the emperor's palace at Peking, agreed, that if each of its parts, taken separately, does not afford so much delight to the eye as some pieces of the grand architecture of Europe, the whole presents a sight superior to any thing they had ever seen before. In the Chinese architecture, when a pillar is two feet in diameter at the base, its height must be 14 feet; and by measures of this kind the height of every building is determined.

Almost all the houses and buildings in China are constructed of wood. One reason of this may be the dread of earthquakes; but, besides this, such buildings are rendered eligible by the heat and dampness of the southern provinces, and the excessive cold in the northern, which would render stone-houses almost uninhabitable. Even at Peking, where the rains are but of short duration, it is found necessary to cover the small marble staircases belonging to the imperial palace with pieces of felt; the humidity of the air moistens and soaks into every thing. During winter the cold is so exceedingly severe, that no window can be opened to the north; and water continues constantly frozen to the depth of a foot and a half for more than three months. For the same reasons a variety of stories are not used in the Chinese buildings; as neither a second nor third story would be habitable during the great heats of summer or the rigorous cold of winter. Though Peking is situated in the northern part of the empire, the heat there, during the dog-days, is so intolerably scorching, that the police obliges tradesmen and shopkeepers to sleep in the open air in the piazzas of their houses, lest they should be stifled by retiring into their inner apartments. The habitations of people of rank, or of those in easy circumstances, generally consist of five large courts, inclosed with buildings on every side. The method of building with several stories was, however, followed for several centuries, when the court resided in the southern provinces; and the taste for this kind of building was carried to such a height, that immense edifices were erected from 150 to 200 feet in height, and the pavilions or towers at the extremities rose upwards of 300 feet. This kind of building, however, at length became disgusting; though either to preserve the remembrance of it, or for the sake of variety, there are still some buildings to be seen several stories high in the palaces belonging to the emperor.

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Bridges.

A multiplicity of bridges are rendered necessary in China by the vast number of canals and rivers which intersect the empire. Anciently, however, the Chinese bridges were much more ingenious as well as magnificent than they are at present. Some of them were so contrived that they could be erected in one day to supply the place of others which might happen to be broken down, or for other purposes. At that time they had bridges which derived their name from their figure; as *resembling the rainbow*; *draw-bridges*, *bridges to move with pulleys*, *compass-bridges*, &c. with many

others entirely unknown at present. The building of bridges indeed was once a luxurious folly of the emperors; so that they were multiplied from whim or caprice, without any necessity, and without use. Still, however, many of them are extremely beautiful and magnificent. The arches of some are very lofty and acute, with easy stairs on each side, the steps of which are not quite three inches in thickness, for the greater facility of ascending and descending: others have no arches, but are composed of large stones, sometimes 18 feet in length, placed transversely upon piles like planks. Some of these bridges are constructed of stone, marble, or brick; others of wood; and some are formed of a certain number of barks joined together by very strong iron chains. These are known by the name of floating bridges, and several of them are to be seen on the large rivers Kiang and Hoang-ho.

For several centuries the Chinese have made no progress in ship-building. Their vessels have neither mizen, bowsprit, nor top-mast. They have only a main and fore-mast, to which is sometimes added a small top-gallant-mast. The main mast is placed almost in the same part of the deck as ours; but the fore-mast stands much farther forward. The latter is to the former in the proportion of two to three; and the main-mast is generally two-thirds of the length of the vessel. They use mats for sails, strengthening them with whole bamboos equal in length to the breadth of the sail, and extended across it at the distance of a foot from one another. Two pieces of wood are fixed to the top and bottom of the sail; the upper serves as a sail yard; and the lower, which is about five or six inches in thickness, keeps the sail stretched when it is necessary to hoist or lower it. This kind of sail may be folded or unfolded like a screen. For caulking their vessels they do not use pitch, but a particular kind of gum mixed with lime, which forms a composition of such excellent quality that one or two wells in the hold are sufficient to keep the vessel dry. They have not yet adopted the use of pumps, and therefore draw up the water with buckets. Their anchors are made of the hard wood called *iron-wood*, which they say is much superior to the metal, because the latter sometimes bend, but the former never do.

The Chinese pretend to have been the first inventors of the mariner's compass, but seem to have little inclination to improve such an important instrument: however, they are well acquainted with the art of manœuvring a vessel, and make excellent coasting pilots, though they are bad sailors in an open sea.

CHINA-Root, in the *Materia Medica*, the root of a species of *SMILAX*, brought both from the East and West Indies; and thence distinguished into oriental and occidental. Both sorts are longish, full of joints, of a pale-reddish colour, with no smell, and very little taste. The oriental, which is the most esteemed, is considerably harder, and paler-coloured than the other. Such should be chosen as is fresh, close, heavy, and upon being chewed appears full of a fat unctuous juice. It is generally supposed to promote insensible perspiration and the urinary discharge, and by its unctuous quality to obtund acrimonious juices. China-root was first brought into Europe in the year 1535, and used as a specific against venereal and cutaneous disorders.

China,
China-
Root.141
Ship-build-
ing.

China-
Ware
||
Chione.

disorders. With this view it was made use of for some time; but has long since given place to, more powerful medicines.

CHINA-Ware. See PORCELAIN.

CHINCA, a sea-port town of Peru in South America, situated in an extensive valley of the same name, in W. Long. 76. 0. S. Lat. 13. 0.

CHINCOUGH, a convulsive kind of cough to which children are generally subject. See *MEDICINE Index.*

CHINESE, in general denotes any thing belonging to China or its inhabitants.

CHINESE Swanpan. See ABACUS.

CHINKAPIN. See FAGUS, *BOTANY Index.*

CHINNOR, a musical instrument among the Hebrews, consisting of 32 chords. Kircher has given a figure of it, which is copied on Plate CXLV.

CHINON, an ancient town of Tourain in France, remarkable for the death of Henry II. king of England, and for the birth of the famous Rabelais. It is seated on the river Vienne, in a fertile and pleasant country, in E. Long. 0. 18. N. Lat. 47. 2.

CHIO, or CHIOS, an Asiatic island lying near the coast of Natolia, opposite to the peninsula of Ionia. It was known to the ancients by the name of Ethalia, Macris, Pithyusa, &c. as well as that of Chios. According to Herodotus, the island of Chios was peopled originally from Ionia. It was at first governed by kings: but afterwards the government assumed a republican form, which by the direction of Isocrates was modelled after that of Athens. They were, however, soon enslaved by tyrants, and afterwards conquered by Cyrus king of Persia. They joined the other Grecians in the Ionian revolt; but were shamefully abandoned by the Samians, Lesbians, and others of their allies; so that they were again reduced under the yoke of the Persians, who treated them with the utmost severity. They continued subject to them till the battle of Mycale, when they were restored to their ancient liberty: this they enjoyed till the downfall of the Persian empire, when they became subject to the Macedonian princes. In the time of the emperor Vespasian the island was reduced to the form of a Roman province; but the inhabitants were allowed to live according to their own laws under the superintendance of a prætor. It is now subject to the Turks, and is called *Scio*. See that article.

CHIOCOCCA. See *BOTANY Index.*

CHIONANTHUS, the SNOW-DROP or FRINGE-TREE. See *BOTANY Index.*

CHIONE, in fabulous history, was daughter of Dædalion, of whom Apollo and Mercury became enamoured. To enjoy her company, Mercury lulled her to sleep with his caduceus; and Apollo, in the night, under the form of an old woman, obtained the same favours as Mercury. From this embrace Chione became mother of Philammon and Autolycus; the former of whom, as being son of Apollo, became an excellent musician; and the latter was equally notorious for his robberies, of which his father Mercury was the patron. Chione grew so proud of her commerce with the gods, that she even preferred her beauty to that of Juno; for which impiety she was killed by the goddess and changed into a hawk.—Another of the same name was daughter of Boreas and Ori-

thya, who had Eumolpus by Neptune. She threw her son into the sea; but he was preserved by his father.

CHIOS. See CHIO and SCIO.

CHIOURLIC, an ancient town of Turkey in Europe, and in Romania, with a see of a Greek bishop. It is seated on a river of the same name, in E. Long. 7. 47. N. Lat. 41. 18.

CHIOZZO, an ancient and handsome town of Italy, in the territory of Venice, and in a small island, near the Lagunes, with a podesta, a bishop's see, and a harbour defended by a fort. E. Long. 12. 23. N. Lat. 45. 17.

CHIPPENHAM, a town of Wiltshire, seated on the river Avon. It is a good thoroughfare town; has a handsome stone bridge over the river, consisting of 16 arches; and sends two members to parliament. There is here a manufacture of the best superfine woollen cloth in England. W. Long. 2. 12. N. Lat. 51. 25.

CHIPPING, a phrase used by the potters and china-men to express that common accident both of our own stone and earthen ware, and the porcelain of China, the flying off of small pieces, or breaking at the edges. Our earthen wares are particularly subject to this, and are always spoiled by it before any other flaw appears in them. Our stone wares escape it better than these; but not so well as the porcelain of China, which is less subject to it than any other manufacture in the world. The method by which the Chinese defend their ware from this accident, is this: They carefully burn some small bamboo canes to a sort of charcoal, which is very light, and very black; this they reduce to a fine powder, and then mix it into a thin paste, with some of the varnish which they use for their ware: they next take the vessels when dried, and not yet baked, to the wheel; and turning them softly round, they, with a pencil dipt in this paste, cover the whole circumference with a thin coat of it: after this, the vessel is again dried; and the border made with this paste appears of a pale grayish colour when it is thoroughly dry. They work on it afterwards in the common way, covering both this edge and the rest of the vessel with the common varnish. When the whole is baked on, the colour given by the ashes disappears, and the edges are as white as any other part; only when the baking has not been sufficient, or the edges have not been covered with the second varnishing, we sometimes find a dusky edge, as in some of the ordinary thick tea-cups. It may be a great advantage to our English manufactures to attempt something of this kind. The willow is known to make a very light and black charcoal: but the elder, though a thing seldom used, greatly exceeds it. The young green shoots of this shrub, which are almost all pith, make the lightest and the blackest of all charcoal; this readily mixes with any liquid, and might be easily used in the same way that the Chinese use the charcoal of the bamboo cane, which is a light hollow vegetable, more resembling the elder shoots than any other English plant. It is no wonder that the fixed salt and oil contained in this charcoal should be able to penetrate the yet raw edges of the ware, and to give them in the subsequent baking a somewhat different degree of vitrification from the other parts of the vessel; which, though, if given to the whole, it

Chies
||
Chipping.

Chirograph
||
Chiron.

it might take off from the true semivitrified state of that ware, yet at the edges is not to be regarded, and only serves to defend them from common accidents, and keep them entire. The Chinese use two cautions in this application: the first in the preparation; the second in the laying it on. They prepare the bamboo canes for burning into charcoal, by peeling off the rind. This might easily be done with our elder shoots, which are so succulent, that the bark strips off with a touch. The Chinese say, that if this is not done with their bamboo, the edges touched with the paste will burst in the baking: this does not seem indeed very probable; but the charcoal will certainly be lighter made from the peeled sticks, and this is a known advantage. The other caution is, never to touch the vessel with hands that have any greasy or fatty substance about them; for if this is done, they always find the vessel crack in that place.

CHIROGRAPH, was anciently a deed which, requiring a counterpart, was engrossed twice on the same piece of parchment, counterwise; leaving a space between, wherein was written CHIROGRAPH; through the middle whereof the parchment was cut, sometimes straight, sometimes indentedly; and a moiety given to each of the parties. This was afterwards called *dividenda*, and *chartæ divise*; and was the same with what we now call *charter-party*. See *CHARTER-Party*. The first use of these chirographs, with us, was in the time of Henry III.

CHIROGRAPH was also anciently used for a fine: and, the manner of engrossing the fines, and cutting the parchment in two pieces, is still retained in the office called the *chirographer's office*.

CHIROGRAPHER of FINES, an officer in the common pleas, who engrosses FINES acknowledged in that court into a perpetual record (after they have been examined, and passed by other officers), and writes and delivers the indentures thereof to the party. He makes two indentures; one for the buyer, the other for the seller; and a third indented piece, containing the effect of the fine, and called *the foot of the fine*; and delivers it to the *custos brevium*.—The same officer also, or his deputy, proclaims all fines in court every term, and indorses the proclamations on the backside of the foot; keeping, withal, the writ of covenant, and the note of the fine.

CHIRONANCY, a species of divination drawn from the lines and lineaments of a person's hand, by which means, it is pretended, the dispositions may be discovered. See *DIVINATION*, N° 9.

CHIRON, a famous personage of antiquity; styled by Plutarch, in his dialogue on music, "*The wise Centaur*." Sir Isaac Newton places his birth in the first age after Deucalion's deluge, commonly called the *Golden Age*; and adds, that he formed the constellations for the use of the Argonauts, when he was 83 years old; for he was a practical astronomer, as well as his daughter Hippo: he may, therefore, be said to have flourished in the earliest ages of Greece, as he preceded the conquest of the Golden Fleece, and the Trojan war. He is generally called the son of Saturn and Philyra; and is said to have been born in Thesaly among the CENTAURS, who were the first Greeks that had acquired the art of breaking and riding horses: whence the poets, painters, and sculptors, have

represented them as a compound of man and horse; and perhaps it was at first imagined by the Greeks, as well as the Americans, when they first saw cavalry, that the horse and the rider constituted the same animal.

Chiron was represented by the ancients as one of *Burney's* the first inventors of medicine, botany, and *chirurgery*; a word which some etymologists have derived from his name. He inhabited a grotto or cave in the foot of Mount Pelion, which, from his wisdom and great knowledge of all kinds, became the most famous and frequented school throughout Greece. Almost all the heroes of his time were fond of receiving his instructions; and Xenophon, who enumerates them, names the following illustrious personages among his disciples: Cephalus, Æsculapius, Melanion, Nestor, Amphiarus, Peleus, Telamon, Meleager, Theseus, Hippolitus, Palamedes, Ulysses, Mnestheus, Diomedes, Castor and Pollux, Machaon and Podalirius, Antilochus, Æneas, and Achilles. From this catalogue it appears, that Chiron frequently instructed both fathers and sons; and Xenophon has given a short eulogium on each, which may be read in his works, and which redounds to the honour of the preceptor. The Greek historian, however, has omitted naming several of his scholars, such as Bacchus, Phœnix, Cocytus, Arystæus, Jason, and his son Medeus, Ajax, and Proteusilus. Of these we shall only take notice of such as interest Chiron more particularly. It is pretended that the Grecian Bacchus was the favourite scholar of the Centaur; and that he learned of this master the revels, orgies, bacchanalia, and other ceremonies of his worship. According to Plutarch, it was likewise at the school of Chiron that Hercules studied music, medicine, and justice; though Diodorus Siculus tells us, that Linus was the music-master of this hero. But among all the heroes who have been disciples of this Centaur, no one reflected so much honour upon him as Achilles, whose renown he in some measure shared; and to whose education he in a particular manner attended, being his grandfather by the mother's side. Apollodorus tells us, that the study of music employed a considerable part of the time which he bestowed upon his young pupil, as an incitement to virtuous actions, and a bridle to the impetuosity of his temper. One of the best remains of antique painting now existing, is a picture upon this subject, dug out of the ruins of Herculaneum, in which Chiron is teaching the young Achilles to play on the lyre. The death of this philosophic musician was occasioned, at an extreme old age, by an accidental wound in the knee with a poisoned arrow, shot by his scholar Hercules at another. He was placed after his death by Musæus among the constellations, through respect for his virtues, and in gratitude for the great services which he had rendered the people of Greece. Sir Isaac Newton says*, * *Chronol.* in proof of the constellations being formed by Chiron. 151 and Musæus for the use and honour of the Argonauts, that nothing later than the expedition was delineated on the sphere: according to the same author, Chiron lived till after the Argonautic expedition, in which he had two grandsons. The ancients have not failed to attribute to him several writings; among which, according to Suidas, are *precepts*, *υποθηκας*, in verse, composed for the use of Achilles; and a medicinal treatise

Chironia
||
Chiton.

tife on the *diseases incident to horses* and other quadrupeds, *ἰππιωργίχον*; the lexicographer even pretends, that it is from this work the Centaur derived his name. Fabricius gives a list of the works attributed to Chiron, and discusses the claims which have been made for others to the same writings: and in vol. xiii. he gives him a distinguished place in his catalogue of ancient physicians.

CHIRONIA. See BOTANY *Index*.

CHIRONOMY, in antiquity, the art of representing any past transaction by the gestures of the body, more especially by the motions of the hands: this made a part of liberal education; it had the approbation of Socrates, and was ranked by Plato among the political virtues.

CHIROTONTY, among ecclesiastical writers, denotes the imposition of hands used in conferring priestly orders. However, it is proper to remark, that chirotony originally was a method of electing magistrates, by holding up the hands.

CHIRURGEON, or SURGEON. See SURGEON.

CHIRURGERY. See SURGERY.

CHISLEY LAND, in *Agriculture*, a soil of a middle nature between sandy and clayey land, with a large admixture of pebbles.

CHISON, KISON, or KISSON, (Judges iv. and v.) a river of Galilee; said to rise in Mount Tabor, to run by the town of Naim, and to fall into the Mediterranean between Mount Carmel and Ptolemais, (1 Kings xviii. 40.)

CHISSEL, or CHISEL, an instrument much used in sculpture, masonry, joinery, carpentry, &c.

There are chisfels of different kinds; though their chief difference lies in their different size and strength, as being all made of steel well sharpened and tempered: but they have different names, according to the different uses to which they are applied. The chisfels used in carpentry and joinery are, 1. The former; which is used first of all before the parting chissel, and just after the work is scribed. 2. The paring-chissel; which has a fine smooth edge, and is used to pare off or smooth the irregularities which the former makes. This is not struck with a mallet as the former is, but is pressed with the shoulder of the workman. 3. Skew-former: this is used for cleansing acute angles with the point or corner of its narrow edge. 4. The mortise-chissel; which is narrow, but very thick and strong, to endure hard blows, and it is cut to a very broad basif. Its use is to cut deep square holes in the wood for mortises. 5. The gouge, which is a chissel with a round edge; one side whereof serves to prepare the way for an augre, and the other to cut such wood as is to be rounded, hollowed, &c. 6. Socket-chisfels, which are chiefly used by carpenters, &c. have their shank made with a hollow socket at top; to receive a strong wooden sprig, fitted into it with a shoulder. These chisfels are distinguished, according to the breadth of the blade, into half-inch chisfels, three quarters of an inch chisfels, &c. 7. Ripping chisfels; which is a socket-chissel of an inch broad, having a blunt edge, with no basif to it. Its use is to rip or tear two pieces of wood asunder, by forcing in the blunt edge between them.

CHITON, in *Zoology*, a genus of the order of vermes testaceæ. The name *chiton* is from *χιτών, lorica*,

a coat of mail. The shell is plated, and consists of many parts lying upon each other transversely: the inhabitant is a species of the DORIS. See CONCHOLOGY *Index*.

CHITTIM, in *Ancient Geography*, according to Le Clerc, Calmet, and others, was the same with Macedonia, peopled by Kittim the son of Javan and grandson of Noah.

CHITTRICK'S MEDICINE FOR THE STONE. This medicine was some years ago kept as a secret, and had great reputation as a lithontriptic, which indeed it seems in many cases to deserve. It was discovered by Dr Blackrie to be no other than soap-lye; and the following receipt for using it was procured by General Dunbar: "Take one tea-spoonful of the strongest soap-lye, mixed in two table-spoonfuls of sweet milk, an hour before breakfast and at going to bed. Before you take the medicine, take a sup of pure milk, and immediately after you have swallowed the medicine take another. If you find this agrees with you for two or three days, you may add half as much more to the dose."

CHIVALRY, (from *cheval*, "a horse"); an abstract term, used to express the peculiar privileges, obligations, and turn of mind, with all the other distinguishing characteristics of that order of men who flourished in Europe in the dark ages, during the vigour of the feudal systems of government, under the name of *Knights* or *Knights Errant*.

To ascertain the period at which the order sprung up, and the circumstances to which its origin was owing, is no easy task. In the history of society, such a multiplicity of collateral facts appear interwoven together, and causes and effects run into each other by a gradation so imperceptible, that it is exceedingly difficult, even for the nicest eye, to discern causes from their immediate effects, or to distinguish to which among a number of collateral circumstances the origin of any particular event is to be referred. The age to which we must look for the origin of chivalry was singularly rude and illiterate. Even the principal events of that period, emigrations, wars, and the establishment of systems of laws and forms of government, have been but imperfectly, and in many instances unfaithfully, recorded. But the transactions which took place in the ordinary course of civil and domestic life, and which, though less striking, must have always prepared the way for the more remarkable events, have been generally thought unworthy of transmission to posterity, and have very seldom found a historian. Add to these difficulties which oppose our researches on this subject, that the nations of Europe were in that age a mixed multitude, consisting of the aboriginal inhabitants, who, though either subdued by the Roman arms, or at least compelled to retire to the woods and mountains, still obstinately retained their primitive manners and customs; Roman colonies, and such of the original inhabitants of the countries in which these were established, as had yielded not only to the arms of the Romans, but also to the influence of their laws, arts, and manners; and the barbarians, who proceeding from the northern regions of Asia and Europe, the wilds of Scythia and Germany, dissolved the fabric of the Roman empire, and made themselves lords of Europe. Amid this confusion of nations, institutions, and

Chittim
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Chivalry.

¹ Definition.

² Difficulty of tracing the origin of chivalry.

Chivalry. and customs, it becomes almost impossible to trace any regular series of causes and effects.

Yet as the history of that period is not entirely unknown to us, and the obscure and imperfect records in which it is preserved, while they commemorate the more remarkable events, throw a faint light on the customs, manners, and ordinary transactions of the age; we can at least collect some circumstances, which if they did not of themselves give rise to the institution of chivalry, must certainly have co-operated with others to that end. We may even be allowed, if we proceed with due diffidence and caution, to deduce, from a consideration of the effect, some inferences concerning the cause; from those particulars of its history which are known to us, we may venture to carry imagination backwards, under a proper restraint, to those which are hid under the darkness of a rude and illiterate age.

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Distinction
of ranks an
essential
part of the
mechanism
of society.

Distinction of ranks appears to be essentially necessary to the existence of civil order. Even in the simplest and rudest social establishments, we find not merely the natural distinctions of weak and strong, young and old, parent and child, husband and wife; these are always accompanied with others which owe their institution to the invention of man, and the consent, either tacit or formal, of the society among whom they prevail. In peace and in war, such distinctions are equally necessary: they constitute an essential and important part of the mechanism of society.

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The early
pre-emi-
nence of
the milita-
ry charac-
ter.

One of the earliest artificial distinctions introduced among mankind, is that which separates the bold and skilful warrior from those whose feebleness of body and mind renders them unable to excel in dexterity, stratagem, or valour. Among rude nations, who are but imperfectly acquainted with the advantages of social order, this distinction is more remarkably eminent than in any other state of society. The ferocity of the human character in such a period produces almost continual hostilities among neighbouring tribes; the elements of nature, and the brute inhabitants of the forest, are not yet reduced to be subservient to the will of man; and these, with other concomitant circumstances, render the warrior, who is equally distinguished by cunning and valour, more useful and respectable than any other character.

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Subordi-
nate dis-
tinctions
of rank in-
troduced
into so-
ciety.

On the same principles, as the boundaries of society are enlarged, and its form becomes more complex, the classes into which it is already distinguished are again subdivided. The invention of arts, and the acquisition of property, are the chief causes of these new distinctions which now arise among the orders of society; and they extend their influence equally through the whole system. Difference of armour, and different modes of military discipline, produce distinction of orders among those who practise the arts of war; while other circumstances, originating from the same general causes, occasion similar changes to take place amidst the scenes of peace.

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The dis-
tinction in-
troduced
into the
military
order by
the use of
cavalry.

None of the new distinctions which are introduced among men, with respect to the discipline and conduct of war, in consequence of the acquisition of property and the invention of arts, is more remarkable than that occasioned by the use of horses in military expeditions, and the training of them to the evolutions of the military art. Fire-arms, it is true, give

to those who are acquainted with them a greater superiority over those to whom their use is unknown, than what the horseman possesses over him who fights on foot. But the use of fire-arms is of such importance in war, and the expence attending it so considerable, that wherever these have been introduced, they have seldom been confined to one particular order in an army; and, therefore, they produce indeed a remarkable, though transient, distinction among different nations; but establish no permanent distinctions in the armies in any one nation. But to maintain a horse, to equip him with costly furniture, to manage him with dexterity and vigour, are circumstances which have invariably produced a standing and conspicuous distinction among the military order, wherever bodies of cavalry have been formed. The Roman *equites*, who, though they became at length a body of usurers and farmers-general, were originally the only body of cavalry employed by the state, occupied a respectable rank between the senators and the plebeians; and the elegance and humanity of their manners were suitable to their rank. In ancient Greece, and in the celebrated monarchies of Asia, the same distinction prevailed at a similar period.

Chivalry.

Since the circumstances and principles on which this distinction depends are not such as must be confined in their influence to one particular nation, or one region of the globe, we may hope to trace their effects among the savage warriors of Scythia and Germany, as well as among the Greeks or Romans. From the valuable treatise of Tacitus *de moribus Germanorum*, we learn that, among the German warriors a distinction somewhat of this nature *did* actually subsist; not so much indeed a distinction between the warrior who fought on horseback and those who fought on foot, as between those whom vigour of body and energy of mind enabled to brave all the dangers of war, and such as, from the imbecility of youth, the infirmities of age, or the natural inferiority of their mental and bodily powers, were unequal to scenes of hardship and deeds of valour. The youth was not permitted to take arms and join his warlike countrymen in their military expeditions whenever he himself thought proper: there was a certain age before which he could not be invested with armour. When he had attained that period, if not found deficient in strength, activity, or courage, he was formally honoured with the shield and the lance, called to the duties, and admitted to all the privileges of a warrior.

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Military
distinctions
among the
ancient
Germans.

Another fact worthy of notice, respecting the manners of the barbarians of Germany before they established themselves in the cultivated provinces of the Roman empire, is, that their women, contrary to what we find among many other rude nations, were treated with a high degree of respect. They did not generally vie with the men in deeds of valour, but they animated them by their exhortations to distinguish themselves in the field; and virgins especially were considered with a sacred veneration, as endowed with prophetic powers, capable of foreseeing events hid in the womb of futurity, and even of influencing the will of the deities. Hence, though domestic duties were their peculiar province, yet they were not harshly treated nor confined to a state of slavery. There appears indeed a striking analogy between the condition of the women

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Respecta-
bility of the
women a-
mong the
Germans.

Chivalry. among the rude soldiers of Sparta and the rank which they occupied among the warlike cantons of Germany. Perhaps, indeed, the German were still more honourable than the Spartan women; as they were taught to wield the magic weapons of superstition, which in Greece were appropriated to the priests.

It appears, therefore, that, in the forests of Germany at least, if not the more northern regions of Asia and Europe, the conquerors of the Roman empire, before they penetrated into its provinces, treated their women with a degree of respect unknown to most of the nations of antiquity; that the character of the warrior was likewise highly honourable, being understood to unite all those qualities which were in the highest estimation; and that it was only at a particular age, and with certain forms, that the youth were admitted to bear arms.

When those nations sallied from their deserts and forests, overran the Roman empire, and established themselves in its provinces, the changes which took place on their circumstances were remarkable; and by a natural influence, it could not but produce an equally remarkable change on their habits, customs, and manners. The great outlines might still remain: but they could not now fail to be filled up in a different manner. Here, however, the records of history are peculiarly imperfect. We have no Cæsar or Tacitus to supply facts or direct our reasonings; the Gothic nations had not yet learned to read and write; and the Romans were so depressed under the sense of their own miseries, as to be negligent of the changes which happened around them. But as soon as the light of history begins again to dawn, we find that the leading features of the barbarian character were not effaced, but only modified in a particular manner, in consequence of their mixing among a more polished people, becoming acquainted with the luxuries of life, and acquiring extensive power and property.

Those who fought on horseback now began to be distinguished with peculiar honours. The manners of the warrior too were become more cultivated, and his spirit more humane. Leisure and opulence, with the influence of a polished people, even though in a state of slavery, taught those barbarians to aspire after more refined pleasures and more splendid amusements than those with which they had been before satisfied. The influence of Christianity, too, which, though grossly corrupted, was still favourable to the social happiness of mankind, concurred to polish their manners and exalt their character. Hence, in the end of the tenth and in the beginning of the eleventh century, we see knight-errantry, with that romantic gallantry, piety, and humanity, by which it was principally distinguished, make its appearance. At the court of every prince, count, or baron, jousts and tournaments became the favourite amusements. At those entertainments, skill in arms, devotion to the fair, and generous courtesy, were all at once cultivated. About this period began the crusades; and these, to which alone some have referred the origin of chivalry, though they could not give rise to what was already in existence, yet moulded the form and directed the spirit of the institution in such a manner, as to raise it by a rapid progress from infancy, as it were, to full vigour and maturity. Its character, as it appeared when fully

formed, is well described by an eloquent historian in Chivalry. the following manner:

“Between the age of Charlemagne and that of the ^{Gibbon,} crusades, a revolution had taken place among the Spaniards, the Normans, and the French, which was gradually extended to the rest of Europe. The service of the infantry was degraded to the plebeians; the cavalry formed the strength of the armies, and the honourable name of *miles*, or soldier, was confined to the gentlemen who served on horseback, and were invested with the character of knighthood. The dukes and counts, who had usurped the rights of sovereignty, divided the provinces among their faithful barons: the barons distributed among their vassals the fiefs or benefices of their jurisdiction; and these military tenants, the peers of each other and of their lord, composed the noble or equestrian order, which disdained to conceive the peasant or burgher as of the same species with themselves. The dignity of their birth was preserved by pure and equal alliances; their sons alone who could produce four quarters or lines of ancestry, without spot or reproach, might legally pretend to the honour of knighthood; but a valiant plebeian was sometimes enriched, and ennobled by the sword, and became the father of a new race. A single knight could impart, according to his judgment, the character which he received; and the warlike sovereigns of Europe derived more glory from this personal distinction than from the lustre of their diadem. This ceremony was in its origin simple and profane; the candidate, after some previous trial, was invested with his sword and spurs; and his cheek or shoulder were touched with a slight blow, as an emblem of the last affront which it was lawful for him to endure. But superstition mingled in every public and private action of life: In the holy wars, it sanctified the profession of arms; and the order of chivalry was assimilated in its rights and privileges to the sacred orders of priesthood. The bath and white garment of the novice were an indecent copy of the regeneration of baptism: his sword, which he offered on the altar, was blessed by the ministers of religion; his solemn reception was preceded by fasts and vigils; and he was created a knight in the name of God, of St George, and of St Michael the archangel. He swore to accomplish the duties of his profession; and education, example, and the public opinion, were the inviolable guardians of his oath. As the champion of God and the ladies, he devoted himself to speak the truth; to maintain the right; to protect the distressed; to practise *courtesy*, a virtue less familiar to the ancients; to pursue the infidels; to despise the allurements of ease and safety; and to vindicate in every perilous adventure the honour of his character. The abuse of the same spirit provoked the illiterate knight to disdain the arts of industry and peace; to esteem himself the sole judge and avenger of his own injuries; and proudly to neglect the laws of civil society and military discipline. Yet the benefits of this institution, to refine the temper of barbarians, and to infuse some principles of faith, justice, and humanity, were strongly felt, and have been often observed. The asperity of national prejudice was softened; and the community of religion and arms spread a similar colour and generous emulation over the face of Christendom. Abroad, in enterprise and pilgrimage;

Changes in the manners of the barbarians after they settled in the Roman empire, which gave rise to chivalry.

Chivalry. pilgrimage; at home, in martial exercise, the warriors of every country were perpetually associated; and impartial taste must prefer a Gothic tournament to the Olympic games of classic antiquity. Instead of the naked spectacles which corrupted the manners of the Greeks, and banished from the stadium the virgins and matrons, the pompous decoration of the lists was crowned with the presence of chaste and high-born beauty, from whose hands the conqueror received the prize of his dexterity and courage. The skill and strength that were exerted in wrestling and boxing, bear a distant and doubtful relation to the merit of a soldier; but the tournaments, as they were invented in France, and eagerly adopted both in the east and west, presented a lively image of the business of the field. The single combats, the general skirmish, the defence of a pass or castle, were rehearsed as in actual service; and the contest, both in real and mimic war, was decided by the superior management of the horse and lance. The lance was the proper and peculiar weapon of the knight: his horse was of a large and heavy breed; but this charger, till he was roused by the approaching danger, was usually led by an attendant, and he quietly rode a pad or palfrey of a more easy pace. His helmet and sword, his greaves and buckler, it would be superfluous to describe; but I may remark, that at the period of the crusades, the armour was less ponderous than in later times; and that, instead of a massy cuirass, his breast was defended by a hauberk or coat of mail. When their long lances were fixed in the rest, the warriors furiously spurred their horses against the foe; and the light cavalry of the Turks and Arabs could seldom stand against the direct and impetuous weight of their charge. Each knight was attended to the field by his faithful squire, a youth of equal birth and similar hopes; he was followed by his archers and men at arms; and four, or five, or six soldiers, were computed as the furniture of a complete lance. In the expeditions to the neighbouring kingdoms or the Holy Land, the duties of the feudal tenure no longer subsisted; the voluntary service of the knights and their followers was either prompted by zeal or attachment, or purchased with rewards and promises; and the numbers of each squadron were measured by the power, the wealth, and the fame of each independent chieftan. They were distinguished by his banner, his armorial coat, and his cry of war: and the most ancient families of Europe must seek in these achievements the origin and proof of their nobility."

The respectable author of the Letters on Chivalry and Romance, traces, with great ingenuity and erudition, a strong resemblance between the manners of the age of chivalry and those of the old heroic ages delineated by Homer.

10
The resemblance between heroic and Gothic manners.

There is, says he, a remarkable correspondence between the manners of the old heroic times, as painted by their great romancer Homer, and those which are represented to us in the modern books of knight-errantry. A fact of which no good account can be given, but by another not less certain; that the political state of Greece, in the earliest periods of its story, was similar in many respects to that of Europe, as broken by the feudal system into an infinite number of petty independent governments.

Some obvious circumstances of agreement between the heroic and Gothic manners may be worth putting down.

1. The military enthusiasm of the barons is but of a piece with the fanaticism of the heroes. Hence the same particularity of description in the accounts of battles, wounds, deaths, in the Greek poet as in the Gothic romancers. Hence that minute curiosity in the display of their dresses, arms, accoutrements. The minds of all men being occupied with warlike images and ideas, were much gratified by those details, which appear cold and uninteresting to modern readers.

We hear much of knights-errant encountering giants and quelling savages in books of chivalry. These giants were oppressive feudal lords; and every lord was to be met with, like the giant, in his strong-hold or castle. Their dependents of a lower form, who imitated the violence of their superiors, and had not their castles but lurking places, were the savages of romance. The greater lord was called a giant for his power; the less, a savage for his brutality.

2. Another terror of the Gothic ages was monsters, dragons, and serpents. Their stories were received in those days for several reasons: 1. From the vulgar belief of enchantments: 2. From their being reported on the faith of eastern tradition, by adventurers from the Holy Land: 3. In still later times from the strange things told and believed on the discovery of the new world.

In all these respects, Greek antiquity resembles the Gothic. For what are Homer's Læstrigons and Cyclops, but bands of lawless savages, with each of them a giant of enormous size at their head? And what are the Grecian Bacchus, Hercules, and Theseus, but knights-errant, the exact counterparts of Sir Lancelot and Amadis de Gaul?

3. The oppressions which it was the glory of the knights to avenge, were frequently carried on, as we are told, by the *charms and enchantments of women*. These charms, we may suppose, are often metaphorical; as expressing only the blandishments of the sex. Sometimes they are taken to be real, the ignorance of those ages acquiescing in such conceits. And are not these stories matched by those of Calypso and Circe, the enchantresses of the Greek poet?

4. Robbery and piracy were honourable in both: so far were they from reflecting any discredit on the ancient or modern *redressers of wrongs*. What account can be given of this, but that, in the feudal times, and in the early days of Greece, when government was weak, and unable to redress the injuries of petty sovereigns, it would be glorious for private adventurers to undertake this work; and, if they could accomplish it in no other way, to pay them in kind by downright plunder and rapine?

5. Bastardy was in credit with both. They were extremely watchful over the chastity of their own women; but such as they could seize upon in the enemy's quarter, were lawful prize. Or if, at any time, they transgressed in this sort at home, the fault was covered by an ingenious fiction. The offspring was reputed divine. Their greatest heroes were the fruit of goddesses approached by mortals; just as we hear of the doughtiest knights being born of fairies.

6. With the greatest fierceness and savageness of character, the utmost generosity, hospitality, and courtesy,

Chivalry.

tesy, were imputed to the heroic ages. Achilles was at once the most relentless, vindictive, implacable, and the friendliest of men. We have the very same representation in the Gothic romances. As in those lawless times, dangers and distresses of all kinds abounded, there would be the same demand for compassion, gentleness, and generous attachments to the unfortunate, those especially of their own clan, as of resentment, rage, and animosity against their enemies.

7. Again, the martial games celebrated in ancient Greece, on great and solemn occasions, had the same origin and the same purpose as the tournaments of the Gothic warriors.

8. Lastly, the passions for adventures so natural in their situation, would be as naturally attended with the love of praise and glory. Hence the same encouragement, in the old Greek and Gothic times, to pænyrists and poets. In the affairs of religion and gallantry, indeed, the resemblance between the hero and the knight is not so striking. But the religious character of the knight was an accident of the times, and no proper effect of his civil condition. And that his devotion for the fair sex should so far surpass that of the hero, is a confirmation of the system here advanced. For the consideration had of the females in the feudal constitution, will of itself account for this deference. It made them capable of succeeding to fiefs, as well as the men. And does not one instantly perceive what respect and dependence this privilege would draw upon them?

It was of great consequence who should obtain the favour of a rich heiress. And though, in the strict feudal times, she was supposed to be in the power and at the disposal of her superior lord, yet this rigid state of things did not last long. Hence we find some distressed damsel was the spring and mover of every knight's adventure. She was to be rescued by his arms, or won by the fame and admiration of his prowess. The plain meaning of all which was this: That as, in these turbulent times, a protector was necessary to the weakness of the sex, so the courteous and valorous knight was to approve himself fully qualified for that purpose.

It may be observed, that the two poems of Homer were intended to expose the mischiefs and inconveniences arising from the political state of Old Greece: the *Iliad*, the dissensions that naturally spring up among independent chiefs; and the *Odyssey*, the insolence of their greater subjects, more especially when unrestrained by the presence of their sovereign. And can any thing more exactly resemble the condition of the feudal times, when, on occasion of any great enterprise, as that of the crusades, the designs of the confederate Christian states were perpetually frustrated, or interrupted at least, by the dissensions of their leaders; and their affairs at home, as perpetually distressed and disordered by the rebellious usurpations of their greater vassals? Jerusalem was to the European what Troy had been to the Grecian princes. See the article KNIGHT.

CHIVALRY, in *Law*, is used for a tenure of lands by knight's service, whereby the knight was bound to perform service in war unto the king, or the mesne lord of whom he held by that tenure. And chivalry was either general or special: *general*, when it was

only in the feoffment that the tenant held *per servitium militare*, without any specification of serjeantry, escuage, &c.; *special*, when it was declared particularly by what kind of knight service the land was held.

For the better understanding of this tenure it hath been observed, that there is no law but is holden mediately or immediately of the crown by some service; and therefore all freeholds that are to us and our heirs, are called *feuda*, or *feoda*, "fees; as proceeding from the king for some small yearly rent, and the performance of such services as were originally laid upon the land at the donation thereof. For as the king gave to the great nobles, his immediate tenants, large possessions for ever, to hold of him for this or that service or rent; so they in time parcelled out to such others as they liked the same lands for rents and services as they thought good: and these services were by Littleton divided into two kinds, *chivalry* and *focage*; the first whereof was martial and military, the other rustic. Chivalry, therefore, was a tenure of service, whereby the tenant was obliged to perform some noble or military office unto his lord: and it was of two kinds; either *regal*, that is, held only of the king; or *common*, where held of a common person. That which might be held only of the king was called *servitium*, or *sergentia*; and was again divided into *grand* and *petit* serjeantry. The grand serjeantry was where one held lands of the king by service, which he ought to do in his own person: as, to bear the king's banner or spear, to lead his host, to find men at arms to fight, &c. Petit serjeantry was when a man held lands of the king, to yield him annually some small thing towards his wars, as a sword, dagger, bow, &c. Chivalry that might be holden of a common person was termed *scutagium*, "escuage;" that is, service of the shield; which was either uncertain or certain.

Escuage uncertain, was likewise two-fold: first, where the tenant was bound to follow his lord, going in person to the king's wars, either himself, or sending a sufficient man in his place, there to be maintained at his expence, so long as was agreed upon between the lord and his first tenant at the granting of the fee; and the days of such service seem to have been rated by the quantity of land so holden; as, if it extended to a whole knight's fee, then the tenant was to follow his lord 40 days; and if but to half a knight's fee, then 20 days; if a fourth part, then 10 days, &c. The other kind of this escuage was called *castle-ward*, where the tenant was obliged, by himself or some other, to defend a castle as often as it should come to his turn. And these were called *escuage uncertain*; because it was uncertain how often a man should be called to follow his lord to the wars, or to defend a castle, and what his charge would be therein.

Escuage certain, was where the tenure was set at a certain sum of money to be paid in lieu of such service; as that a man should pay yearly for every knight's fee 20s. for half a knight's fee 10s. or some like rate; and this service, because it is drawn to a certain rent, groweth to be of a mixed nature, not merely focage, and yet focage in effect, being now neither personal service nor uncertain. The tenure called chivalry had other conditions annexed to it: but there is a great alteration made in these things by the stat. 12. Car. II. c. 24. whereby tenures by knight's service of the king,

Chivalry.

Chivalry. or any other person *in capite*, &c. and the fruits and consequences thereof, are taken away and discharged; and all tenures are to be construed and adjudged to be free and common socage, &c.

Court of CHIVALRY, a court formerly held before the lord high constable and earl marshal of England jointly, and having both civil and criminal jurisdiction: but since the attainder of Stafford duke of Buckingham under Henry VIII. and the consequent extinguishment of the office of lord high constable, it hath usually, with respect to civil matters, been heard before the earl marshal only. This court, by stat. 13. Rich. II. c. 2. hath cognizance of contracts and other matters touching deeds of arms and war, as well out of the realm as in it. And from its sentences lies an immediate appeal to the king in person. This court was in great reputation in the times of pure chivalry; and afterwards during the English connexions with the continent, by the territories which their princes held in France: but it is now grown almost entirely out of use, on account of the feebleness of its jurisdiction, and want of power to enforce its judgements; as it can neither fine nor imprison, not being a court of record.

1. The *civil* jurisdiction of this court of chivalry is principally in two points; the redressing injuries of honour, and correcting encroachments in matters of coat-armour, precedence, and other distinctions of families. As a court of honour, it is to give satisfaction to all such as are aggrieved in that point; a point of a nature so nice and delicate, that its wrongs and injuries escape the notice of the common law, and yet are fit to be redressed somewhere. Such, for instance, as calling a man *coward*, or giving him the lie; for which, as they are productive of no immediate damage to his person or property, no action will lie in the courts at Westminster; and yet they are such injuries as will prompt every man of spirit to demand some honourable amends; which, by the ancient law of the land, was given in the court of chivalry. But modern resolutions have determined, that how much soever a jurisdiction may be expedient, yet no action for words will at present lie therein. And it hath always been most clearly holden, that as this court cannot meddle with any thing determinable by common law, it therefore can give no pecuniary satisfaction or damages; inasmuch as the quantity and determination thereof is ever of common law cognizance. And therefore this court of chivalry can at most order reparation in point of honour; as to compel the defendant *mendacium sibi ipsi imponere*, or to take the lie that he has given upon himself, or to make such other submission as the laws of honour may require. As to the other point of its civil jurisdiction, the redressing of usurpations and encroachments in matters of heraldry and coat-armour; it is the business of this court, according to Sir Matthew Hale, to adjust the right and armorial ensigns, bearings, crests, supporters, pennons, &c.; and also rights of places or precedence, where the king's patent or act of parliament, which cannot be overruled by this court, have not already determined it. The proceedings of this court are by petition in a summary way; and the trial not by a jury of 12 men, but by witnesses, or by com-

bat. But as it cannot imprison, not being a court of record; and as, by the resolutions of the superior courts, it is now confined to so narrow and restrained a jurisdiction, it has fallen into contempt. The marshalling of coat-armour, which was formerly the pride and study of all the best families in the kingdom, is now greatly disregarded; and has fallen into the hands of certain officers and attendants upon this court, called *heralds*, who consider it only as a matter of lucre, and not of justice; whereby such falsity and confusion have crept into their records (which ought to be the standing evidence of families, descents, and coat-armour), that though formerly some credit has been paid to their testimony, now even their common seal will not be received as evidence in any court of justice in the kingdom. But their original visitation books, compiled when progresses were solemnly and regularly made into every part of the kingdom, to inquire into the state of families, and to register such marriages and descents as were verified to them upon oath, are allowed to be good evidence of pedigrees.

2. As a *criminal* court, when held before the lord high constable of England jointly with the earl marshal, it had jurisdiction over pleas of life and member, arising in matters of arms and deeds of war, as well out of the realm as within it. But the criminal as well as civil part of its authority is fallen into entire disuse, there having been no permanent high constable of England (but only *pro hac vice*, at coronations and the like), since the attainder and execution of Stafford duke of Buckingham, in the 13th year of Henry VIII.; the authority and charge, both in war and peace, being deemed too ample for a subject; so ample, that when the chief justice Fineux was asked by King Henry VIII. how far they extended? he declined answering, and said, the decision of that question belonged to the law of arms, and not to the law of England.

CHIVES, in *Botany*, are slender thread-like substances, generally placed within the blossom, and surrounding the *POINTALS*. They are formed of the woody substance of the plant.

CHIUM MARMOR, in the natural history of the ancients, the name of a black marble, called also the *lapis opsidianus*. It is very hard, and of a fine black; and, beside the many uses which the ancients put it to, is well known among our goldsmiths by the name of the *touchstone*; most of them being furnished with nothing better for this purpose than a piece of this: though the basaltes, which might be had plentifully enough, is greatly preferable for those uses; any black marble, however, that is tolerably hard, will do. There is a very fine and elegantly smooth marble, of a compact texture, and fine glossy black, but showing no glittering particles when freshly broken, as most of the black marbles do. It is extremely hard, and cuts with difficulty, but is capable of the highest polish of any marble. The ancients had it from Ethiopia and the island of Chios; we have it from Italy.

CHIUM VINUM, *Chian Wine*, or wine of the growth of the island of Chios, now Scio, is commended by Dioscorides as affording good nourishment, fit to drink; less disposed to intoxicate, endued with the virtue of restraining defluxions, and a proper ingredient in ophthalmic

Chivalry
||
Chium
Vinum.

Chiun
||
Chocolate

thalmic medicines. Hence Scribonius Largus directs the dry ingredients in collyria for the eyes to be made up with Chian wine.

CHIUN, or CHEVAN, in Hebrew antiquity. We meet with this word in the prophet Amos, cited in the Acts of the Apostles. St Luke reads the passage thus: "Ye took up the tabernacle of Moloch, and the star of your god Remphan, figures which ye made to worship them." The import of the Hebrew is as follows: "Ye have borne the tabernacle of your kings, and the pedestal (the *chiun*) of your images, the star of your gods, which ye made to yourselves." The Septuagint in all probability read *Rephan* or *Revan*, instead of *Chiun* or *Chevan*, and took the pedestal for a god.

Some say that the Septuagint, who made their translation in Egypt, changed the word *Chiun* into that of *Remphan*, because they had the same signification. M. Bafnage, in his book entitled *Jewish Antiquities*, after having discoursed a good deal upon *Chion* or *Remphan*, concludes that Moloch was the sun, and *Chion*, *Chiun*, or *Remphan*, the moon.

CHLAMYS, in antiquity, a military habit worn by the ancients over the tunica. It belonged to the patricians, and was the same in the time of war that the toga was in the time of peace. This sort of gown was called *picla*, from the rich embroidery with figures in Phrygian work; and *purpurea*, because the groundwork was purple. The chlamydes of the emperors were all purple, adorned with a golden and embroidered border.

CHLOEIA, in antiquity, a festival celebrated at Athens in honour of Ceres, to whom, under the name *Χλον*, i. e. *grafs*, they sacrificed a ram.

CHLORA. See BOTANY *Index*.

CHLOROSIS, in *Medicine*, a disease, commonly called the *green-sickness*, incident to young girls. See MEDICINE *Index*.

CHOCOLATE, in commerce, a kind of paste or cake prepared of certain ingredients, the basis of which is cacao. See CACAO.

The Indians, in their first making of chocolate, used to roast the cacao in earthen pots; and having afterwards cleared it of the husks, and bruised it between two stones, they made it into cakes with their hands. The Spaniards improved this method. When the cacao is properly roasted and well cleaned, they pound it in a mortar, to reduce it into a coarse mass, which they afterwards grind on a stone till it be of the utmost fineness: the paste being sufficiently ground, is put quite hot into tin moulds, in which it congeals in a very little time. The form of these moulds is arbitrary; the cylindrical ones, holding two or three pounds, are the most proper, because the bigger the cakes are, the longer they will keep. Observe, that these cakes are very liable to take any good or bad scent, and therefore they must be carefully wrapt up in paper, and kept in a dry place. Complaints are made, that the Spaniards mix with the cacao nuts too great a quantity of cloves and cinnamon, besides other drugs without number, as musk, ambergris, &c. The grocers of Paris use few or none of these ingredients: they only choose the best nuts, which are called *caracca*, from the place from whence they are brought; and

with these they mix a very small quantity of cinnamon, the freshest vanilla, and the finest sugar, but very seldom any cloves. In England the chocolate is made of the simple cacao, excepting that sometimes sugar and sometimes vanilla is added.

Chocolate
||
Choerilus.

Chocolate ready made, and cacao paste, are prohibited to be imported from any part beyond the seas. If made and sold in Great Britain, it pays inland duty 1s. 6d. per lb. avoirdupoise: it must be inclosed in papers containing one pound each, and produced at the excise office to be stamped. Upon three days notice given to the officer of excise, private families may make chocolate for their own use, provided no less than half an hundred weight of nuts be made at one time.

The chocolate made in Portugal and Spain is not near so well prepared as the English, depending perhaps on the machine employed there, viz. the double cylinder, which seems very well calculated for exact triture. If perfectly prepared, no oil appears on the solution. London chocolate gives up no oil like the foreign; and it also may in some measure depend on the thickness of the preparation. The solution requires more care than is commonly imagined. It is proper to break it down, and dissolve it thoroughly in cold water by milling it with the chocolate stick. If heat is applied, it should be done slowly; for, if suddenly, the heat will not only coagulate it, but separate the oil; and therefore much boiling after it is dissolved is hurtful. Chocolate is commonly required by people of weak stomachs; but often rejected for want of proper preparation. When properly prepared, it is easily dissolved; and an excellent food where a liquid nutrient vegetable one is required, and is less flatulent than any of the farinacea.

Mr Henley, an ingenious electrician, has lately discovered that chocolate, fresh from the mill, as it cools in the tin pans into which it is received, becomes strongly electrical; and that it retains this property for some time after it has been turned out of the pans, but soon loses it by handling. The power may be once or twice renewed by melting it again in an iron ladle, and pouring it into the tin-pans as at first; but when it becomes dry and powdery, the power is not capable of being revived by simple melting: but if a small quantity of olive-oil be added, and well mixed with the chocolate in the ladle, its electricity will be completely restored by cooling it in the tin-pan as before. From this experiment he conjectures, that there is a great affinity between carbonic acid and the electric fluid, if indeed they be not the same thing.

CHOCOLATE Nut Tree. See CACAO.

CHOENIX, *χοινίξ*, an ancient dry measure, containing the 48th part of a *medimnus*, or six bushels.

CHOERILUS, a tragic poet of Athens about the 64th Olympiad. He wrote 150 tragedies, of which 13 had obtained the prize.—An historian of Samos.—Two other poets, one of whom was very intimate with Herodotus. He wrote a poem on the victory which the Athenians had obtained over Xerxes; and on account of the excellence of the composition he received a piece of gold for each verse from the Athenians. The other was one of Alexander's flatterers and friends.

CHOERINÆ,

Choerinae
||
Chopin.

CHOERINÆ, in antiquity, a kind of sea-shells, with which the ancient Greeks used to give their suffrage, or vote.

CHOIR, that part of the church or cathedral where choristers sing divine service; it is separated from the chancel where the communion is celebrated, and also from the nave of the church where the people are placed: the patron is said to be obliged to repair the choir of the church. It was in the time of Constantine that the choir was separated from the nave. In the 12th century they began to enclose it with walls; but the ancient ballustrades have been since restored, out of a view to the beauty of architecture.

CHOIR, in nunneries, is a large hall adjoining to the body of the church, separated by a grate, where the nuns sing the office.

CHOISI, FRANCIS TIMOLEON DE, dean of the cathedral of Bayeux, and one of the forty of the French academy, was born at Paris in 1644. In the early part of his life he was much distinguished by his frivolous manners, and particularly by appearing even at court in a female dress. In 1685, he was sent with the chevalier de Chaumont to the king of Siam, and was ordained priest in the Indies by the apostolical vicar. He wrote a great number of works, in a polite, florid, and easy style; the principal of which are, 1. Four Dialogues on the Immortality of the Soul, &c. 2. Account of a Voyage to Siam. 3. An Ecclesiastical History, in 11 vols. 4to. 4. Life of David, with an Interpretation of the Psalms. 5. Life of Solomon, &c. He died at Paris in 1724.

CHOLEDOCHUS, in *Anatomy*, a term applied to a canal, or duct, called also *ductus communis*; formed of the union of the porus biliaris and ductus cysticus. The word comes from *χολη cholera*; and *δεχομαι, I receive, or contain*.

The choledochus ductus passing obliquely to the lower end of the duodenum, serves to convey the bile from the liver to the intestines. See *ANATOMY Index*.

CHOLER. See *BILE*.

CHOLERA MORBUS, a sudden eruption or overflowing of the bile or bilious matters both upwards and downwards. See *MEDICINE Index*.

CHOMER, or *OMER*. See *CORUS*.

CHONDRILLA. See *BOTANY Index*.

CHONDROPTERYGII, in *Ichthyology*, a term formerly applied to the order of fishes now called *amphibia nantes* by Linnæus. See *AMPHIBIA*.

CHOP-CHURCH, or *CHURCH-CHOPPER*, a name, or rather a nick-name, given to parsons who make a practice of exchanging benefices. See *PERMUTATION*.

Chop-church occurs in an ancient statute as a lawful trade or occupation; and some of the judges say it was a good addition. Brook holds, that it was no occupation, but a thing permissible by law.

CHOPIN, or *CHOPINE*, a liquid measure used both in Scotland and France, and equal to half their pint. See *PINT* and *MEASURE*.

CHOPINE, *Rene*, a famous civilian born at Bailleul in Anjou in 1537. He was advocate in the parliament of Paris, where he pleaded for a long time with great reputation. He at last shut himself up in his closet, and composed many works, which have been

collected together, and printed in 6 vols. folio. He died at Paris in 1606.

CHORAL, signifies any person that, by virtue of any of the orders of the clergy, was in ancient times admitted to sit and serve God in the choir.

Dugdale, in his history of St Paul's church, says, that there were with the chorus formerly six vicars choral belonging to that church.

CHORASSAN, or *KHORASSAN*, a province of Persia, adjoining to Usbec Tartary. This was the ancient Bactria, and the birth-place of Kouli Khan.

CHORAX, or *CHARAX*. See *CHARACENE*.

CHORAZIM, or *CHORAZIN*, (Luke, Matthew), a town of Galilee, whose wretched incredulity Christ deplores; now desolate, at two miles distance from Capernaum.

CHORD, or *CORD*, primarily denotes a slender rope or cordage*. The word is formed of the Latin, * See *Cor-chorda*, and that from the Greek, *χορδη, a gut*, where-dage. of strings may be made.

CHORD, in *Geometry*, a right line drawn from one part of an arch of a circle to another. Hence,

CHORD of an Arch, is a right line joining the extremes of that arch.

CHORD, in *Music*, the union of two or more sounds uttered at the same time, and forming together an entire harmony.

The natural harmony produced by the resonance of a sounding body, is composed of three different sounds, without reckoning their octaves; which form among themselves the most agreeable and perfect chord that can possibly be heard: for which reason they are called, on account of their excellence, *perfect chords*. Hence, in order to render that harmony complete, it is necessary that each chord should at least consist of three sounds. The trio is likewise found by musicians to include the perfection of harmony; whether because in this all the chords, and each in its full perfection, are used; or, because upon such occasions as render it improper to use them all, and each in its integrity, arts have been successfully practised to deceive the ear, and to give it contrary persuasion, by deducing it with the principal sounds of each *chord*, in such a manner as to render it forgetful of the other sounds necessary to their completion. Yet the octave of the principal sound produces new relations, and new consonances, by the completion of the intervals: they commonly add this octave, to have the assemblage of all the consonances in one and the same *chord*; (See *CONSONANCE*). Moreover, the addition of the dissonance (See *DISCORD*), producing a fourth sound superadded to the perfect chord, it becomes indispensably necessary, if we would render the chord full, that we should include a fourth part to express this dissonance. Thus, the series of chords can neither be complete nor connected but by means of four parts.

Chords are divided into perfect and imperfect. The *perfect chord* is that which we have lately described; which is composed of the fundamental sound below, of its third, its fifth, and its octave: they are likewise subdivided into major and minor, according as the thirds which enter into their composition are flat or sharp: (See *INTERVAL*). Some authors likewise give the

Choral
||
Chord.

Chords.

the name of *perfect* to all chords, even to dissonances, whose fundamental sounds are below. Imperfect chords are those in which the sixth, instead of the fifth, prevails, and in general all those whose lowest are not their fundamental sounds. These denominations, which had been given before the fundamental bass was known, are now most unhappily applied: those of chords *direct* and *reversed* are much more suitable in the same sense.

Chords are once more divided into consonances and dissonances. The chords denominated *consonances*, are the perfect chord, and its derivatives: every other chord is a *dissonance*.

A table of both, according to the system of M. Rameau, may be seen in Rousseau's Musical Dictionary, vol. i. p. 27.

After the table to which our readers have been permitted, Rousseau adds the following observations, which are at the same time so just and so important, that we should be very sorry if they escape the reader's attention.

At the words *harmony, fundamental bass, composition*, &c. he promises to treat concerning the manner of using all the chords to form regular harmony; and only adds, in this place, the subsequent reflections.

1. It is a capital error to imagine, that the methods of inverting the same chord are in all cases equally eligible for the harmony and for the expression. There is not one of these different arrangements but had its proper character. Every one feels the contrast between the softness of the false fifth, and the grating sound of the tritone, though the one of these intervals is produced by a method of inverting the other. With the seventh diminished, and the second redundant, the case is the same with the interval of the second in general use, and the seventh. Who does not feel how much more vocal and sonorous the fifth appears when compared with the fourth? The chord of the great sixth, and that of the lesser sixth minor, are two forms of the same fundamental chord: but how much less is the one harmonious than the other? On the contrary, the chord of the lesser sixth major is much more pleasing and cheerful than that of the false fifth. And only to mention the most simple of all chords, reflect on the majesty of the perfect chord, the sweetness of that which is called the chord of the sixth, and the insipidity of that which is composed of a sixth and a fourth; all of them, however, composed of the same sounds. In general, the redundant intervals, the sharps on the higher part, are proper by their severity to express violent emotions of mind, such as anger and the rougher passions. On the contrary, flats in the higher parts, and diminished intervals, form a plaintive harmony, which melts the heart. There are a multitude of similar observations, of which when a musician knows how to avail himself, he may command at will the affections of those who hear him.

2. The choice of simple intervals is scarcely of less importance than that of the chords, with regard to the stations in which they ought to be placed. It is, for instance, in the lower parts that the fifth and octave should be used in preference; in the upper parts, the third and sixth are more proper. If you transpose

this order, the harmony will be ruined, even though the same chords are preserved.

3. In a word, the chords are rendered still more harmonious by being approximated and only divided by the smallest practicable intervals, which are more suitable to the capacity of the ear than such as are remote. This is what we call *contracting* the harmony; an art which few composers have skill and abilities enough to put in practice. The limits in the natural compass of voices, afford an additional reason for lessening the distance of the intervals, which compose the harmony of the chorus, as much as possible. We may affirm, that a chorus is improperly composed, when the distance between the chords increases; when those who perform the different parts are obliged to scream when the voices rise above their natural extent, and are so remotely distant one from the other that the perception of harmonical relations between them is lost.

We say likewise, that an instrument is in *concord* when the intervals between its fixed sounds are what they ought to be; we say in this sense, that the chords of an instrument are true or false, that it preserves or does not preserve its chords. The same form of speaking is used for two voices which sing together, or for two sounds which are heard at the same time, whether in unison or in parts.

CHORDS, or CORDS, of Musical Instruments, are strings, by the vibration of which the sensation of sound is excited, and by the divisions of which the several degrees of tone are determined.

CHORDEE, in Medicine and Surgery, a symptom attending a gonorrhœa, consisting in a violent pain under the scenum, and along the duct of the urethra, during the erection of the penis, which is incurvated downwards. These erections are frequent and involuntary.

CHOREA SANCTI VITI. See *VITUS's Dance*.

CHOREPISCOPUS, an officer in the ancient church, about whose function the learned are extremely divided. The word comes from *χωρος*, a region or little country, and *επισκοπος* a bishop or overseer.

The chorepiscopi were suffragan or local bishops, holding a middle rank between bishops and presbyters, and delegated to exercise episcopal jurisdiction within certain districts, when the boundaries of particular churches, over which separate bishops presided, were considerably enlarged. It is not certain when this office was first introduced: some trace it to the close of the first century: others tell us, that chorepiscopi were not known in the east till the beginning of the fourth century; and in the west about the year 439. They ceased both in the east and west in the tenth century.

CHOREPISCOPUS is also the name of a dignity still subsisting in some cathedrals, particularly in Germany; signifying the same with *chori episcopus*, or "bishop of the choir." The word, in this sense, does not come from *χωρος*, place, but *χορος*, choir, &c. In the church of Cologne, &c. the first chanter is called *chorepiscopus*.

CHOREUS, *Χορος*, a foot in the ancient poetry, more commonly called *trocheus*. See *TROCHEE*.

CHORIAMBUS, in ancient poetry, a foot consisting

Chords

||
Choriam-
bus.

Chorus
||
Chorus.

sisting of four syllables, whereof the first and last are long, and the two middle ones are short; or, which is the same thing, it is made up of a trochæus and iambus: such is the word *nobilitas*.

CHORION, in *Anatomy*, the exterior membrane which invests the fœtus in the uterus. See FOETUS.

CHOROBATA, or CHOROBATES, a kind of water level among the ancients, of the figure of the letter T, according to Vitruvius's description.

CHOROGRAPHY, the art of making a map of any country or province.

Chorography differs from geography, as the description of a particular country differs from that of the whole earth; and from topography, as the description of a country is different from that of a town or district. See the articles GEOGRAPHY, TOPOGRAPHY, and MAP.

CHOROIDES, or CHOROIDES in *Anatomy*, a term applied to several parts of the body, bearing some resemblance to the chorion. The word is formed from *χοριον*, *chorion*, and *ειδος*, *likeness*.

CHOROIDES is particularly used for the inner membrane which immediately invests the brain; so called as being intermingled with a great number of blood-vessels, like the *chorion*: but more usually denominated the *pia mater*, or *meninx tenuis*.

Plexus or *Lacis CHOROIDES*, is a knot of veins and arteries in the anterior ventricle of the brain, woven out of the branches of the carotid.

CHOROIDES is also applied to the inner and posterior tunic of the eye, immediately under the sclerotica. It is soft, thin, and black; and its inner or concave surface is very smooth and polished. It has its name from its being interspersed with vessels.

CHORUS, in dramatic poetry, one or more persons present on the stage during the representation, and supposed to be by-standers without any share in the action.

Tragedy in its origin was no more than a single chorus, who trod the stage alone, and without any actors, singing dithyrambics or hymns in honour of Bacchus. Thespis, to relieve the chorus, added an actor, who rehearsed the adventures of some of their heroes; and Æschylus, finding a single person too dry an entertainment, added a second, at the same time reducing the singing of the chorus, to make more room for the recitation. But when once tragedy began to be formed, the recitative, which at first was intended only as an accessory part to give the chorus a breathing time, became a principal part of the tragedy. At length, however, the chorus became inserted and incorporated into the action: sometimes it was to speak; and then their chief, whom they called *coryphæus*, spoke in behalf of the rest: the singing was performed by the whole company; so that when the coryphæus struck into a song, the chorus immediately joined him.

The chorus sometimes also joined the actors in the course of the representation, with their complaints and lamentations on account of any unhappy accidents that befel them: but the proper function, and that for which it seemed chiefly retained, was to show the intervals of the acts: while the actors were behind the scenes, the chorus engaged the spectators; their songs usually turned on what was exhibited, and were not to con-

tain any thing but what was suited to the subject, and had a natural connection with it; so that the chorus concurred with the actors for advancing the action. In the modern tragedies the chorus is laid aside, and the fiddles supply its place. M. Dacier looks on this retrenchment as of ill consequence, and thinks it robs tragedy of a great part of its lustre; he therefore judges it necessary to re-establish it, not only on account of the regularity of the piece, but also to correct, by prudent and virtuous reflections, any extravagancies that might fall from the mouths of the actors when under any violent passion.

M. Dacier observed also, that there was a chorus, or grex, in the ancient comedy: but this is suppressed in the new comedy, because it was used to reprove vices by attacking particular persons; as the chorus of the tragedy was laid aside to give the greater probability to those kinds of intrigue which require secrecy.

CHORUS, in *Music*, is when, at certain periods of a song, the whole company are to join the singer in repeating certain couplets or verses.

CHOSE (*Fr.*), "a thing;" used in the common law with divers epithets; as *chose local*, *chose transitory*, and *chose in action*. *Chose local* is such a thing as is annexed to a place, as a mill and the like; *chose transitory* is that thing which is moveable, and may be taken away, or carried from place to place; and *chose in action* is a thing incorporeal, and only a *right*, as an obligation for debt, annuity, &c. And generally all causes of suit for any debt, duty, or wrong, are to be accounted choses in action: and it seems, chose in action may be also called *chose in suspense*; because it hath no real existence or being, nor can properly be said to be in our possession.

CHOSROES I. the Great, king of Persia after his father Cabades, A. D. 532. He made peace with the Romans; but broke it the third year, and forced Justinian to a disadvantageous peace. Afterwards, he was so swelled with his victories, as to bid the emperor's ambassador follow him for audience to Cæsarea: but Tiberius sent an army under Justinian, who made himself master of the country, and put Chosroes to death in 586.

CHOSROES II. His subjects put his father Hormisdas in prison, and the son upon the throne of Persia. He used his father tenderly at first; but afterwards caused him to be put to death. This, together with his killing some of the nobility, obliged him to fly: he gave his horse the bridle, which carried him into a town of the Romans, where Mauricius the emperor received him kindly, and sent an army under Narfes which set him again upon the throne. He took Jerusalem; after this he made himself master of Libya and Egypt, and carried Carthage. Heraclius sued for peace; which was offered him on condition, *That he and his subjects should deny Jesus Christ*: Hereupon Heraclius attacked him with success, and put him to flight. His own son pursued him, and he was starved in prison in 627.

CHOUGH, in *Ornithology*, the trivial name of a species of CORVUS.

CHOUS, in the eastern military orders, the title of the messengers of the divan of Janifaries. There are several degrees of honour in this post. When a person

Chorus
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Chous.

Chowder-
beer
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Chrism.

person is first advanced to it, he is called a *kuchuk*, or little *chous*; after this he is advanced to be the *alloy chous*, that is, the messenger of ceremonies; and from this, having passed through the office of *petelma*, or procurator of the effects of the body, he is advanced to be the *bas chous*.

CHOWDER-BEER, a provincial phrase of Devonshire, denoting a cheap and easily prepared drink, highly commended for preventing the scurvy in long voyages, or for the cure of it where it may have been contracted. It is prepared in the following manner: Take twelve gallons of water, in which put three pounds and a half of black spruce: boil it for three hours, and having taken out the fir or spruce, mix with the liquor seven pounds of melasses, and just boil it up; strain it through a sieve, and when milk-warm put to it about four spoonfuls of yeast to work it. In two or three days stop the bung of the cask; and in five or six days, when fine, bottle it for drinking. Two gallons of melasses are sufficient for a hoghead of liquor; but if melasses cannot be procured, treacle or coarse sugar will answer the purpose.

CHREMnitz, the principal of the nine towns in Upper Hungary, situated about 68 miles north-east of Presburg, and subject to the house of Austria. E. Long. 19. N. Lat. 48. 45.

CHRENECRUDA, a term occurring in writers of the middle ages, and expressing a custom of those times; but its signification is doubtful. It is mentioned in *Lege Salica*, tit. 61. which says, he who kills a man, and hath not wherewithal to satisfy the law or pay the fine, makes oath that he hath delivered up every thing he was possessed of; the truth of which must be confirmed by the oaths of 12 other persons. Then he invites his next relations by the father's side to pay off the remainder of the fine, having first made over to them all his effects by the following ceremony. He goes into his house, and taking in his hand a small quantity of dust from each of the four corners, he returns to the door, and with his face inwards throws the dust with his left hand over his shoulders upon his nearest of kin. Which done, he strips to his shirt; and coming out with a pole in his hand, jumps over the hedge. His relations, whether one or several, are upon this obliged to pay off the composition for the murder. And if these (or any one of them) are not able to pay *iterum super illum chrenecruda, qui pauperior est, jactat, et ille totam legem componat*. Whence it appears, that *chrenecruda jactare*, is the same with throwing the dust gathered from the four corners of the house. Goldastus and Spelman translate it *viridem herbam*, "green grass," from the German *gruen kraut*, or from the Dutch *groen*, "green," and *gruid*, "grass." Wendelinus is of a contrary opinion, who thinks that by this word *denotari purificationis approbationem*, from *chrein*, "pure, chaste, clean;" and *keuren*, "to prove;" so that it must refer to the oaths of the twelve jurors. Be this as it will, King Childebert reformed this law by a decree, chap. 15. both because it favoured of Pagan ceremonies, and because several persons were thereby obliged to make over all their effects: *De chrenecruda lex quam paganorum tempore observabant, deinceps nunquam valeat, quia per ipsam cecidit multorum potestas*.

CHRISM (from *χρισμα*, I anoint), oil consecrated by

the bishop, and used in the Romish and Greek churches, in the administration of baptism, confirmation, ordination, and extreme unction, which is prepared on holy Thursday with much ceremony. In Spain it was anciently the custom for the bishop to take one third of a sol for the chrism distributed to each church, on account of the balsam that entered its composition.

Du Cange observes, that there are two kinds of chrism; the one prepared of oil and balsam, used in baptism, confirmation, and ordination; the other of oil alone, consecrated by the bishop, used anciently for the catechumens, and still in extreme unction. The Maronites, before their reconciliation with Rome, besides oil and balsam, used musk, saffron, cinnamon, roses, white frankincense, and several other drugs mentioned by Rynaldus, in 1541, with the doses of each. The Jesuit Dandini, who went to Mount Libanus in quality of the pope's nuncio, ordained, in a synod held there in 1596, that chrism for the future should be made only of two ingredients, oil and balsam; the one representing the human nature of Jesus Christ, the other his divine nature. The action of imposing the chrism is called *chrismation*: this the generality of the Romish divines hold to be the next matter of the sacrament of confirmation.

The chrismation in baptism is performed by the priest; that in confirmation by the bishop: that in ordination, &c. is more usually styled *unction*.

CHRISM Pence, **CHRISMATIS Denarii**, or **CHRISMALES Denarii**, a tribute anciently paid to the bishop by the parish clergy, for their chrism, consecrated at Easter for the ensuing year: this was afterwards condemned as simoniacal.

CHRISOM, a white garment put upon a child by the priest immediately after baptism, accompanied with this devout prayer; "Take this white vesture as a token of the innocency which, by God's grace in this holy sacrament of baptism, is given unto thee, and for a sign whereby thou art admonished, so long as thou livest, to give thyself to innocence of living, that after this transitory life thou mayest be partaker of life everlasting. Amen."

From this circumstance the white garment got the name of *chrisom*, which, after being worn a few days, was delivered to the priest as a sacred deposit, to be produced in future as an evidence against the person, should he be so impious as to renounce his baptismal engagements. This ceremony continued in use for a considerable time after the reformation in the church of England, which required the mother of the child when churched, to offer the chrisom, and other customary oblations. On pronouncing the above mentioned prayer, the priest anointed the head of the infant, saying, "Almighty God, the father of our Lord Jesus Christ, who hath regenerated thee by water and the Holy Ghost, and hath given unto thee the remission of all thy sins, vouchsafe to anoint thee with the unction of his Holy Spirit, and bring thee to the inheritance of everlasting life. Amen."

CHRIST, an appellation synonymous with *Messiah*, usually added to Jesus: and, together therewith, denominating the Saviour of the world. See **CHRISTIANITY** and **MESSIAH**.

The word *χριστος* signifies *anointed*, from *χρισω*, *inungo*, "I anoint." Sometimes the word *Christ* is used singly,

Chrism
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Christ
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gly, by way of *antonomasis*, to denote a person sent from God, as an anointed prophet, king, or priest.

Order of CHRIST, a military order, founded by Dionysius I. king of Portugal, to animate his nobles against the Moors. The arms of this order are gules, patriarchal cross charged with another cross argent: they had their residence at first at Castromarin: afterwards they removed to the city of Thomar, as being nearer to the Moors of Andalusia and Estremadura.

CHRIST is also the name of a military order in Livonia, instituted in 1205 by Albert bishop of Riga. The end of this institution was to defend the new Christians who were converted every day in Livonia, but were persecuted by the heathens. They wore on their cloaks a sword with a cross over it, whence they were also denominated *brothers of the sword*.

CHRIST-Burgh, a town of Poland, near the lake Draufen, and about three Polish miles from Marienburg.

CHRIST-Church, a borough town of Hampshire, 30 miles south-west of Winchester, near the sea-coast. W. Long. 2. N. Lat. 50. 40. It sends two members to parliament.

CHRIST-Thorn. See RHAMNUS, BOTANY Index.

CHRISTIAN. See CHRISTIANITY and CHRISTIANS.

Most CHRISTIAN King, one of the titles of the king of France.

The French antiquaries trace the origin of this appellation up to Gregory the Great, who, writing a letter to Charles Martel, occasionally gave him that title, which his successors have since retained.

CHRISTIAN Religion, that instituted by Jesus Christ. See CHRISTIANITY.

CHRISTIANITY, the religion of Christians. The word is analogically derived, as other abstracts from their concretes, from the adjective *Christian*. This again is derived from the name *Χριστος*, *Christus*, from the word *χρισω*, *I anoint*. Christ is called the *anointed*, from a custom which extensively prevailed in antiquity, and was originally said to be of divine institution, of anointing persons in the sacerdotal or regal character, as a public signal of their consecration to their important offices, and as a testimony that heaven itself was the guarantee of that relation which then commenced between the persons thus consecrated and their subordinatcs.

The disciples of Jesus, after the death of their teacher, had for some time been called *Nazarenes*, from Nazareth in Galilee where he dwelt; which afterwards became the designation of a particular sect. They, who adopted the principles and professed the religion which he taught, were first distinguished by the name of *Christians* at Antioch. That profession, and those doctrines, we now proceed to delineate with as much perspicuity as the limits of our plan will admit, yet with the conciseness which a work so multiform and extensive requires.

When a Christian is interrogated concerning the nature and foundation of his faith and practice, his ultimate reference, his last appeal, is to the facts, the doctrines, and the injunctions, contained in the books of the Old and New Testament. From these, therefore, and from these alone, must every fair account, or the materials of which it is composed, be extracted

or reduced. Other formularies, or confessions of faith, may, according to the Christian, deserve more or less attention, as they are more or less immediately contained or implied in the scriptures. But whatever is not actually expressed in, or reduced by fair and necessary consequence from, these writings, must be regarded as merely human; and can have no other title to our assent and observation than what they derive from their conformity with the scriptures, with the dictates and feelings of a reformed and cultivated mind, or with those measures which are found expedient and useful in human life. But as those books, from whence the Christian investigates his principles of belief and rules of conduct, have been variously interpreted by different professors and commentators, these diversities have given birth to a multiplicity of different sects. It cannot, therefore, be expected, that any one who undertakes to give an account of Christianity, should comprehend all the writings and opinions which have been propagated and exhibited by historical, systematical, or polemical authors. These, if at all contained in such a work as this, should be ranged under their proper articles, whether scientific, controversial, or biographical. It is our present business, if possible, to confine ourselves to a detail of such facts and doctrines as, in the strict and primitive sense of the word, are *catholic*, or, in other expressions, to such as uniformly have been, and still are, recognized and admitted by the whole body of Christians.

We have already said that these, or at least the greatest number of them, appeal to the scriptures of the Old and New Testament as the ultimate standard, the only infallible rule of faith and manners. If you ask them, by what authority these books claim an absolute right to determine the consciences and understandings of men with regard to what they should believe and what they should do? They will answer you, that all scripture, whether for doctrine, correction, or reproof, was given by immediate inspiration from God.

If again you interrogate them how those books, which they call *Scripture*, are authenticated? they reply, that the evidences by which the Old and New Testament are proved to be the Word of God, are either external or internal. The *external* may again be divided into direct or collateral. The direct evidences are such as arise from the nature, consistency, and probability, of the facts; and from the simplicity, uniformity, competency, and fidelity, of the testimonies by which they are supported. The collateral events are either the same occurrences supported by Hea-then testimonies, or others which concur with and corroborate the history of Christianity. Its *internal* evidence arises either from its exact conformity with the character of God, from its aptitude to the frame and circumstances of man, or from those supernatural convictions and assistances which are impressed on the mind by the immediate operation of the divine Spirit. These can only be mentioned in a cursory manner in a detail so concise as the present.

Such facts as are related in the history of his religion, the Christian asserts to be not only consistent each with itself, but likewise one with another. Hence it is, that, by a series of antecedents and consequences, they corroborate each other, and form a chain

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4
Account of
Christianity
whence
deducible.

5
The nature
of its evi-
dences.

6
How Christi-
anity is
supported
by facts.

1
Origin of
the word.

2
By what
name the
apostles
were first
distinguish-
ed.

3
Delineation
of Christiani-
nity.

Christianity.

which cannot be broken but by an absolute subversion of all historical authenticity. Nor is this all: for, according to him, the facts on which Christianity is founded, not only constitute a series of themselves, but are likewise in several periods the best resources for supplying the chasms in the history of our nature, and preserving the tenor of its annals entire. The facts themselves are either natural or supernatural. By natural facts we mean such occurrences as happen or may happen from the various operations of mechanical powers, or from the interposition of natural agents without higher assistants. Such are all the common occurrences of history, whether natural, biographical, or civil. By supernatural facts, we mean such as could not have been produced without the interposition of Deity, or at least of powers superior to the laws of mechanism or the agency of embodied spirits. Among these may be reckoned the immediate change of water into wine, the instantaneous cure of diseases without the intervention of medicine, the resuscitation of the dead, and others of the same kind. In this order of occurrences may likewise be numbered the exertions and exhibitions of prophetic power, where the persons by whom these extraordinary talents were displayed could neither by penetration nor conjecture unravel the mazes of futurity, and trace the events of which they spoke from their primary causes to their remote completions. So that they must have been the passive organs of some superior Being, to whom the whole concatenation of causes and effects which operate from the origin to the consummation of nature, was obvious at a glance of thought.

7
Natural facts, what, and how conducive to the elucidation of history.

It has already been hinted, that the facts which we have called *natural*, not only agree with the analogy of human events, and corroborate each other, but in a great many emergencies nobly illustrate the history of nature in general. For this a Christian might offer one instance, of which philosophy will not perhaps be able to produce any tolerable solution, without having recourse to the facts upon which Christianity is founded. For if mankind were originally descended from one pair alone, how should it have happened that long before the date of authentic history every nation had its own distinct language? Or, if it be supposed, as some late philosophers have maintained, that man is an indigenous animal in every country; or, that he was originally produced in, and created for, each particular soil and climate which he inhabits; still it may be demanded, whence the prodigious multiplicity, the immense diversity of languages? Is the language of every nation intuitive, or were they dictated by exigences, and established by convention? If the last of these suppositions be true, what an immense period of time must have passed! How many revolutions of material and intellectual nature must have happened! What accessions of knowledge, refinement, civilization, must human intercourse have gained before the formation and establishment even of the most simple, imperfect, and barbarous language! Why is a period so vast obliterated so entirely as to escape the retrospect of history, or tradition, and even of fable itself? Why was the acquisition and improvement of other arts so infinitely distant from that of language, that the era of the latter is entirely lost, whilst we can trace the for-

mer from their origin through the various gradations of their progress. Christianity.

These difficulties, inextricable by all the lights of history or philosophy, this more than Cimmerian darkness, is immediately dissipated by the Mosaic account of the confusion of tongues; wisely intended to separate the tribes of men one from another, to replenish the surface of the globe, and to give its multiplied inhabitants those opportunities of improvement which might be derived from experiment and industry, variously exerted, according to the different situations in which they were placed, and the different employments which these situations dictated. Thus the time of nature's existence is limited to a period within the ken of human intellect. Thus whatever has happened might have happened during the present mode of things; whereas, if we deduce the origin and diversity of language from a period so remotely distant as to be absolutely lost, and entirely detached from all the known occurrences and vicissitudes of time, we must admit the present forms and arrangements of things to have subsisted perhaps for a much longer duration than any mechanical philosopher will allow to be possible. Other instances equally pregnant with conviction might be multiplied; but precluded by the limits of our plan, we proceed to a single observation upon the facts which have been termed *supernatural*.

Of those changes which happen in sensible objects, sensation alone can be judge. Reason has nothing to do in the matter. She may draw conclusions from the testimonies of sense, but can never refute them. If, therefore, our senses inform us that snow is white, in vain would the most learned and subtle philosopher endeavour to convince us, that it was of a contrary colour. He might confound, but never could persuade us. Such changes, therefore, as appear to happen in sensible objects, must either be real or fallacious. If real, the miracle is admitted; if fallacious, there must be a cause of deception equally unaccountable from the powers of nature, and therefore equally miraculous. If the veracity or competency of the witnesses be questioned, the Christian answers, that they must be competent, because the facts which they relate are not beyond their capacity to determine. They must likewise be faithful, because they had no secular motives for maintaining, but many for suppressing or disguising, what they testified. Now the Christian appeals to the whole series of history and experience, whether such a man is or can be found, as will offer a voluntary, solemn, and deliberate sacrifice of truth at the shrine of caprice. But such facts as after a long continuance of time have been found exactly agreeable to predictions formerly emitted, must frustrate the fidelity of testimony, and infallibly prove that the event was known to the Being by whom it was foretold. In vain has it been urged, that prophecies are ambiguous and equivocal. For though they may prefigure subordinate events, yet if the grand occurrences to which they ultimately relate, can alone fulfil them in their various circumstances, and in their utmost extent, it is plain, that the Being by whom they were revealed must have been actually present of those events, and must have had them in view when the predictions were uttered. For this see a learned and

Christianity.

8
This obscurity inapplicability but by the Mosaic account.

9
Miracles, how conducive to prove the truth of Christianity.

10
Prophecy evident by its own nature independent of its vehicles.

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and ingenious Dissertation on the Credibility of Gospel-history, by Dr M^cKnight; where the evidences urged by the Christian in defence of his tenets, which appear detached and scattered through innumerable volumes, are assembled and arranged in such a manner as to derive strength and lustre from the method in which they are disposed, without diminishing the force of each in particular. See also the works of Dr Hurd: consult likewise those of Newton, Sherlock, Chandler, &c. For the evidences of those preternatural facts which have been termed *miracles*, the reader may peruse a short but elegant and conclusive defence of these astonishing phenomena, in answer to Mr Hume, by the Rev. George Campbell, D. D.

11
Properties
common
to all reli-
gions.

It must be obvious to every reflecting mind, that whether we attempt to form the idea of any religion *à priori*, or contemplate those which have been already exhibited, certain facts, principles, or *data*, must be pre-established, from whence will result a particular frame of mind and course of action suitable to the character and dignity of that being by whom the religion is enjoined, and adapted to the nature and situation of those agents who are commanded to observe it. Hence *Christianity* may be divided into *credenda* or doctrines, and *agenda* or precepts.

12
Christian
theology.

As the great foundation of his religion, therefore, the Christian believes the existence and government of one eternal and infinite Essence, which for ever retains in itself the cause of its own existence, and inherently possesses all those perfections which are compatible with its nature; such are, its almighty power, omniscient wisdom, infinite justice, boundless goodness, and universal presence. In this indivisible essence the Christian recognises three distinct subsistences, yet distinguished in such a manner as not to be incompatible with essential unity or simplicity of being. Nor is their essential union incompatible with their personal distinction. Each of them possesses the same nature and properties to the same extent. As, therefore, they are constituents of one God, if we may use the expression, there is none of them subordinate, none supreme. The only way by which the Christian can discriminate them is, by their various relations, properties, and offices. Thus the Father is said eternally to beget the Son, the Son to be eternally begotten of the Father, and the Holy Ghost eternally to proceed from both.

This infinite Being, though absolutely independent and for ever sufficient for his own beatitude, was graciously pleased to create an universe replete with inferior intelligences, who might for ever contemplate and enjoy his glory, participate his happiness, and imitate his perfections. But as freedom of will is essential to the nature of moral agents, that they may cooperate with God in their own improvement and happiness, so their natures and powers are necessarily limited, and by that constitution rendered peccable. This degeneracy first took place in a rank of intelligence superior to man. But guilt is never stationary. Impatient of itself, and cursed with its own feelings, it proceeds from bad to worse, whilst the poignancy of its torments increases with the number of its perpetrations. Such was the situation of Satan and his apostate angels. They attempted to transfer their turpitude and misery to man; and were, alas! but too

successful. Hence the heterogeneous and irreconcilable principles which operate in his nature. Hence that inexplicable medley of wisdom and folly, of rectitude and error, of benevolence and malignity, of sincerity and fraud, exhibited through his whole conduct. Hence the darkness of his understanding, the depravity of his will, the pollution of his heart, the irregularity of his affections, and the absolute subversion of his whole internal economy. These seeds of perdition soon ripened into overt acts of guilt and horror. All the hostilities of nature were confronted, and the whole sublunary creation became a theatre of disorder and mischief.

Here the Christian once more appeals to fact and experience. If these things are so; if *man* is the vessel of guilt and the victim of misery; he demands how this constitution of things can be accounted for? how can it be supposed, that a being so wicked and unhappy should be the production of an infinitely perfect Creator? He therefore insists, that human nature must have been disarranged and contaminated by some violent shock; and that, of consequence, without the light diffused over the face of things by Christianity, all nature must remain an inscrutable and inexplicable mystery.

To redress these evils, to re-establish the empire of virtue and happiness, to restore the nature of man to its primitive rectitude, to satisfy the remonstrances of infinite justice, to purify every original or contracted stain, to expiate the guilt and destroy the power of vice, the eternal Son of God, the second Person of the sacred Trinity, the Logos or Divine Word, the Redeemer or Saviour of the world, the Immanuel or God with us, from whom Christianity takes its name, and to whom it owes its origin, descended from the bosom of his Father; assumed the human nature; became the representative of man; endured a severe probation in that character; exhibited a pattern of perfect righteousness; and at last ratified his doctrine, and fully accomplished all the ends of his mission, by a cruel, unmerited, and ignominious death. Before he left this world, he delivered the doctrine of human salvation, and the rules of human conduct, to his apostles, whom he empowered to instruct the world in all that concerns their eternal felicity, and whom he invested with miraculous gifts to ascertain the reality of what they taught. To them he likewise promised another comforter, even the Divine Spirit, who should relume the darkness, console the woes, and purify the stains, of human nature. Having remained for a part of three days under the power of death, he rose again from the grave, discovered himself to his disciples, conversed with them for some time, then ascended to heaven; from whence the Christian expects him, according to his promise, to appear as the Sovereign Judge of the living and the dead, from whose awards there is no appeal, and by whose sentence the destiny of the pious and the wicked shall be eternally fixed.

Soon after his departure to the right hand of his Father, where, in his human nature, he sits supreme of all created beings, and invested with the absolute administration of heaven and earth, the Spirit of grace and consolation descended on his apostles with visible signatures of divine power and presence. Nor were

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his salutary operations confined to them, but extended to all the rational world, who did not by obstinate guilt repel his influences, and provoke him to withdraw them. These, indeed, were less conspicuous than at the glorious era when they were visibly exhibited in the persons of the apostles. But though his energy is less observable, it is by no means less effectual to all the purposes of grace and mercy.

The Christian is convinced, that there is and shall continue to be a society upon earth, who worship God as revealed in Jesus Christ; who believe his doctrines; who observe his precepts; and who shall be saved by his death, and by the use of these external means of salvation which he hath appointed.

13
The external means of Christianity, what, and how promotive of their end.

These are few and simple. The sacraments of baptism and the eucharist, the interpretation and application of scripture, the habitual exercise of public and private devotion, are obviously calculated to diffuse and promote the interests of truth and virtue, by superinducing the salutary habits of faith, love, and repentance.

The Christian is firmly persuaded, that at the consummation of things, when the purposes of providence in the various revolutions of progressive nature are accomplished, the whole human race shall once more issue from their graves; some to immortal felicity, from the actual perception and enjoyment of their Creator's presence; others to everlasting shame and misery.

It is worthy of observation, that all who profess to believe the Christian system, do not subscribe to the truth of everlasting misery. They conceive it impossible that a good and merciful being could create innumerable intelligences with a view to make them eternally wretched, else they apprehend that existence would be a curse and not a blessing; and that although man, by being created free, becomes amenable to God for his conduct, yet they contend that this God must have seen from eternity what use man would make of his free agency, and have devised the most effectual means for counteracting the evils resulting from moral depravity, and resolved to bring final and eternal good out of all the evil which now does, or which in future may exist. Finally, they deny that any epithet applied to the miseries of a future state denotes duration without end, and they assert that all the judgments inflicted on nations and individuals here upon earth, are manifestly the chastisements of a father for the recovery of delinquents, in which light they also consider the punishments to be inflicted in the world to come. It is our province to give a candid statement of both sides of a question, leaving it to our readers to form a judgment for themselves.

14
Christian morality.

The two grand principles of action, according to the Christian, are, The love of God, which is the sovereign passion in every perfect mind; and the love of man, which regulates our actions according to the various relations in which we stand, whether to communities or individuals. This sacred connection can never be totally extinguished by any temporary injury. It ought to subsist in some degree even amongst enemies. It requires that we should pardon the offences of others, as we expect pardon for our own; and that we should no farther resist evil than is necessary for the preservation of personal rights and social happiness.

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It dictates every relative and reciprocal duty between parents and children, masters and servants, governors and subjects, friends and friends, men and men. Nor does it merely enjoin the observation of equity, but likewise inspires the most sublime and extensive charity, a boundless and disinterested effusion of tenderness for the whole species, which feels their distress and operates for their relief and improvement. These celestial dispositions, and the different duties which are their natural exertions, are the various gradations by which the Christian hopes to attain the perfection of his nature and the most exquisite happiness of which it is susceptible.

Such are the speculative, and such the practical principles of Christianity. From the former, its votaries contend, that the origin, economy, and revolutions of intelligent nature alone can be rationally explained. From the latter they assert, that the nature of man, whether considered in its individual or social capacity, can alone be conducted to its highest perfection and happiness. With the determined Atheists they scarcely deign to expostulate. For, according to them, philosophers who can deduce the origin and constitution of things from casual encounters or mechanical necessity, are capable of deducing any conclusion from any premises. Nor can a more glaring instance of absurdity be produced, than the idea of a contingent or self-originated universe. When Deists and other sectarians upbraid them with mysterious or incompatible principles, they without hesitation remit such cavillers to the creed of natural religion. They demand why any reasoner should refuse to believe three distinct substances in one indivisible essence, who admits that a being may be omnipresent without extension; or that he can impress motion upon other things, whilst he himself is necessarily immovable. They ask the sage, why it should be thought more extraordinary, that the Son of God should be sent to this world, that he should unite the human nature to his own, that he should suffer and die for the relief of his degenerate creatures, than that an existence whose felicity is eternal, inherent, and infinite, should have any motive for creating beings exterior to himself? Is it not, says the Christian, equally worthy of the divine interposition to restore order and happiness where they are lost, as to communicate them where they never have been? Is not infinite goodness equally conspicuous in relieving misery as in diffusing happiness? Is not the existence of what we call evil in the world, under the tuition of an infinitely perfect Being, as inscrutable as the means exhibited by Christianity for its abolition? Vicarious punishment, imputed guilt and righteousness, merit or demerit transferred, are certainly not less reconcilable to human reason, *à priori*, than the existence of vice and punishment in the productions of infinite wisdom, power, and goodness: particularly when it is considered, that the virtues exerted and displayed by a perfect Being in a state of humiliation and suffering, must be meritorious, and may therefore be rewarded by the restored felicity of inferior creatures in proportion to their glory and excellence; and that such merit may apply the blessings which it has deserved, in whatever manner, in whatever degree, and to whomsoever it pleases, without being under any necessity to violate

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This system asserted by the Christian, superior in the excellence of its nature, and the evidence of its reality, to all others.

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violate the freedom of moral agents, in recalling them to the paths of virtue and happiness by a mechanical and irresistible force.

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It will be granted to philosophy by the Christian, that as no theory of mechanical nature can be formed without presupposing sacred and established laws from which she ought rarely if ever to deviate, so in fact she tenaciously pursues these general institutions, and from their constant observance result the order and regularity of things. But he cannot admit, that the important ends of moral and intellectual improvement may be uniformly obtained by the same means. He affirms, that if the hand of God should either remain always entirely invisible, or at least only perceptible in the operation of second causes, intelligent beings would be apt in the course of time to resolve the interpositions of Deity into the general laws of mechanism; to forget his connection with nature, and consequently their dependence upon him. Hence, according to the dictates of common sense, and to the unanimous voice of every religion in every age or clime, for the purposes of wisdom and benevolence, God may not only controul, but has actually controuled, the common course and general operations of nature. So that, as in the material world the law of *cause* and *effect* is generally and scrupulously observed for the purposes of natural subsistence and accommodation; thus suspenses and changes of that universal law are equally necessary for the advancement of moral and intellectual perfection.

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But the disciple of Jesus not only contends, that no system of religion has ever yet been exhibited so consistent with itself, so congruous to philosophy and the common sense of mankind, as Christianity; he likewise avers that it is infinitely more productive of real and sensible consolation than any other religious or philosophical tenets, which have ever entered into the soul, or been applied to the heart of man. For what is death to that mind which considers eternity as the career of its existence? What are the frowns of fortune to him who claims an eternal world as his inheritance? What is the loss of friends to that heart which feels, with more than natural conviction, that it shall quickly rejoin them in a more tender, intimate, and permanent intercourse than any of which the present life is susceptible? What are the fluctuations and vicissitudes of external things to a mind which strongly and uniformly anticipates a state of endless and immutable felicity? What are mortifications, disappointments, and insults, to a spirit which is conscious of being the original offspring and adopted child of God; which knows that its omnipotent Father will, in proper time, effectually assert the dignity and privileges of its nature? In a word, as earth is but a speck of creation, as time is not an instant in proportion to eternity, such are the hopes and prospects of the Christian in comparison of every sublunary misfortune or difficulty. It is therefore, in his judgment, the eternal wonder of angels, and indelible opprobrium of man, that a religion so worthy of God, so suitable to the frame and circumstances of our nature, so consonant to all the dictates of reason, so friendly to the dignity and improvement of intelligent beings, pregnant with genuine comfort and delight, should be rejected and despised. Were there a possibility of suspense or hesi-

tation between this and any other religion extant, he could freely trust the determination of a question so important to the candid decision of real virtue and impartial philosophy.

It must be allowed that the utmost extent of human investigation and research into the doctrine of a future life, reached no farther than splendid conjecture before the promulgation of Christianity, at which period life and immortality were clearly brought to light. It is therefore a singular circumstance that the deist should not perceive the wonderful superiority of the Christian over every other system, if it had nothing else to boast of but this single doctrine, so pregnant with unalloyed felicity. If Christianity be false, the believer of it has nothing to lose, since it inculcates a mode of conduct which must ever be amiable in the eye of infinite goodness; but if it be true, he has every thing to gain: while upon this hypothesis the deist has every thing to lose and nothing to gain. This is a momentous consideration, and that man must be truly infatuated who can treat such an idea with contempt.

Mr Gibbon, in his History of the Decline and Fall of the Roman Empire, mentions five secondary causes to which he thinks the propagation of Christianity, and all the remarkable circumstances which attended it, may with good reason be ascribed. He seems to insinuate, that Divine Providence did not act in a singular or extraordinary manner in disseminating the religion of Jesus through the world; and that, if every other argument which has been adduced to prove the sacred authority of this religion can be parried or refuted, nothing can be deduced from this source to prevent it from sharing the same fate with other systems of superstition. The causes of its propagation were in his opinion founded on the principles of human nature and the circumstances of society. If we ascribe not the propagation of Mahometism, or of the doctrines of Zerdust, to an extraordinary interposition of Divine Providence, operating by an unperceived influence on the dispositions of the human heart, and controuling and confounding the ordinary laws of nature; neither can we, upon any reasonable grounds, refer the promulgation of Christianity to such an interposition.

The secondary causes to which he ascribes these effects are, 1. The inflexible and intolerant zeal of the Christians; derived from the Jewish religion, but purified from the narrow and unsocial spirit which, instead of inviting, deterred the Gentiles from embracing the law of Moses. 2. The doctrine of a future life improved by every additional circumstance which could give weight and efficacy to that important truth. 3. The miraculous powers ascribed to the primitive church. 4. The pure and austere morals of the Christians. 5. The union and discipline of the Christian republic, which gradually formed an independent and increasing state in the heart of the Roman empire.

Before we enter on the examination of Mr Gibbon's causes in the order in which they are here enumerated, we beg leave to remark, that we cannot perceive the propriety of denominating some of these *secondary* causes, since the miraculous powers ascribed to the primitive church, if they were real, must have constituted a primary cause, and if fallacious, could have been no cause at all, if not of its complete subversion. As little can we conceive how such an elegant and learned author

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author could imagine a zeal strictly and properly inflexible and intolerant, as qualified to produce any other effect than the destruction of the system which they are allowed to have been anxious to promote. But our sentiments of these causes assigned by Mr Gibbon will be more fully developed as we proceed in our candid and impartial examination of them.

20
Cause I.

In pointing out the connection between the *first* of these causes and the effects which he represents as arising from it, this learned and ingenious writer observes, that the religion of the Jews does not seem to have been intended to be propagated among the Heathens, and that the conversion of proselytes was rather accidental than consistent with the purport and the general spirit of the institutions of Judaism. The Jews were, of consequence, studious to preserve themselves a peculiar people. Their zeal for their own religion was intolerant, narrow, and unsocial.

In Christianity, when it made its appearance in the world, all the better part of the predominant spirit of Judaism was retained; but whatever might have a tendency to confine its influence within narrow limits was laid aside. Christians were to maintain the doctrines and adhere to the institutions of their religion with sacred fidelity. They were not to violate their allegiance to Jesus by entertaining or professing any reverence for Jupiter or any other of the Heathen deities; it was not even necessary for them to comply with the positive and ceremonial institutions of the law of Moses,—although these were acknowledged to have been of divine origin. The zeal, therefore, which their religion inculcated, was inflexible. It was even intolerant: for they were not to content themselves with professing Christianity and conforming to its laws; they were to labour with unremitting assiduity, and to expose themselves to every difficulty and every danger, in converting others to the same faith.

But the same circumstances which rendered it thus intolerant, communicated to it a more liberal and a less unsocial spirit than that of Judaism. The religion of the Jews was intended only for the few tribes; Christianity was to become a catholic religion; its advantages were to be offered to all mankind.

All the different sects which arose among the primitive Christians uniformly maintained the same zeal for the propagation of their own religion, and the same abhorrence for every other. The orthodox, the Ebionites, the Gnostics, were all equally animated with the same exclusive zeal, and the same abhorrence of idolatry, which had distinguished the Jews from other nations.

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Observations in answer.

Such is the general purport of what Mr Gibbon advances concerning the influence of the first of those secondary causes in the propagation of Christianity. It would be uncandid to deny, that his statement of facts appears to be, in this instance, almost fair, and his deductions tolerably logical. The first Christians were remarkable for their detestation of idolatry, and for the generous disinterested zeal with which they laboured to convert others to the same faith. The first of these principles, no doubt, contributed to maintain the dignity and the purity of Christianity; and the second to disseminate it through the world. But the facts which he relates are scarce consistent throughout. He seems to represent the zeal of the first Christians as so

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hot and intolerant, that they could have no social intercourse with those who still adhered to the worship of Heathen deities. In this case, how could they propagate their religion? Nay, we may even ask, How could they live? If they could not mingle with the Heathens in the transactions either of peace or war; nor witness the marriage or the funeral of the dearest friend, if a Heathen; nor practise the elegant arts of music, painting, eloquence, or poetry; nor venture to use freely in conversation the language of Greece or of Rome;—it is not easy to see what opportunities they could have of disseminating their religious sentiments. If, in such circumstances, and observing rigidly such a tenor of conduct, they were yet able to propagate their religion with such amazing success as they are said to have done; they must surely either have practised some wondrous arts unknown to us, or have been assisted by the supernatural operation of divine power.

But all the historical records of that period, whether sacred or profane, concur to prove, that the primitive Christians in general did not retire with such religious horror from all intercourse with the Heathens. They refused not to serve in the armies of the Roman empire: they appealed to Heathen magistrates, and submitted respectfully to their decision; the husband was often a Heathen, and the wife a Christian; or, again, the husband a Christian, and the wife a Heathen. These are facts so universally known and believed, that we need not quote authorities in proof of them.

This respectable writer appears therefore not to have stated the facts which he produces under this head with sufficient ingenuousness; and he has taken care to exaggerate and improve those which he thinks useful to his purpose with all the dazzling, delusive colours of eloquence. But had the zeal of the first Christians been so intolerant as he represents it, it must have been highly unfavourable to the propagation of their religion: all their wishes to make converts would, in that case, have been counteracted by their unwillingness to mix, in the ordinary intercourse of life, with those who were to be converted. Their zeal, and the liberal spirit of their religion, were indeed secondary causes which contributed to its propagation: but their zeal was by no means so ridiculously intolerant as this writer would have us believe; if it had, it must have produced effects directly opposite to those which he ascribes to it.

In illustrating the influence of the *second* of these secondary causes to which he ascribes the propagation of Christianity, Mr Gibbon displays no less ingenuity than in tracing the nature and the effects of the first. The doctrine of a future life, improved by every additional circumstance which can give weight and efficacy to that important truth, makes a conspicuous figure in the Christian system; and it is a doctrine highly flattering to the natural hopes and wishes of the human heart.

Though the Heathen philosophers were not unacquainted with this doctrine; yet to them the spirituality of the human soul, its capacity of existence in a separate state from the body, its immortality, and its prospect of lasting happiness in a future life, rather appeared things possible and desirable, than truths fully established upon solid grounds. These doctrines, Mr Gibbon would persuade us, had no influence on

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the moral sentiments and general conduct of the Heathens. Even the philosophers, who amused themselves with displaying their eloquence and ingenuity on those splendid themes, did not allow them to influence the tenor of their lives. The great body of the people, who were occupied in pursuits very different from the speculations of philosophy, and were unacquainted with the questions discussed in the schools, were scarce ever at pains to reflect whether they consisted of a material and a spiritual part, or whether their existence was to be prolonged beyond the term of the present life; and they could not regulate their lives by principles which they did not know.

In the popular superstition of the Greeks and Romans, the doctrine of a future state was not omitted. Mankind were not only flattered with the hopes of continuing to exist beyond the term of the present life; but different conditions of existence were promised or threatened, in which retributions for their conduct in human life were to be enjoyed or suffered. Some were exalted to heaven, and associated with the gods; others were rewarded with less illustrious honours, and a more moderate state of happiness, in Elysium; and those, again, who by their conduct in life had not merited rewards, but punishments, were consigned to Tartarus. Such were the ideas of a future state which made a part of the popular superstition of the Greeks and Romans. But they produced only a very faint impression on the minds of those among whom they prevailed. They were not truths supported by evidence; they were not even plausible; they were a tissue of absurdities. They had not therefore a more powerful influence on the morals, than the more refined speculations of the philosophers.

Even the Jews, whose religion and legislature were communicated from heaven, were in general, till within a very short time before the propagation of the gospel, as imperfectly acquainted with the doctrine of a future state as the Greeks and Romans. This doctrine made no part of the law of Moses. It is but darkly and doubtfully insinuated through the other parts of the Old Testament. Those among the Jews who treated the sacred Scriptures with the highest reverence, always denied that such a doctrine could be deduced from any thing which these taught; and maintained that death is the final dissolution of man.

The rude tribes who inhabited ancient Gaul, and some other nations not more civilized than they, entertained ideas of a future life, much clearer than those of the Greeks, the Romans, or the Jews.

Christianity, however, explained and inculcated the truth of this doctrine in all its splendour and all its dignity. It exhibited an alluring, yet not absurd, view of the happiness of a future life. It conferred new horrors on the place of punishment, and added new severity to the tortures to be inflicted, in another world. The authority on which it taught these doctrines, and displayed these views, was such as to silence inquiry and doubt, and to command implicit belief. What added to the influence of the doctrine of a future state of existence, thus explained and inculcated, was, that the first Christians confidently prophesied and sincerely believed that the end of the world, the consummation of all things, was fast approaching, and that the generation then present should live to witness that awful

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event. Another circumstance which contributed to render the same doctrine so favourable to the propagation of Christianity was, that the first Christians dealt damnation without remorse, and almost without making any exceptions, on all who died in the belief of the absurdities of Heathen superstition. Thus taught and improved with these additional and heightening circumstances, this doctrine, partly by presenting alluring prospects and exciting pleasing hopes, partly by working upon the fears of the human heart with representations of terror, operated in the most powerful manner in extending the influence of the Christian faith.

Here, too, facts are rather exaggerated, and the inferences scarce fairly deduced. It must be confessed, that the speculations of the Heathen philosophers did not fully and undeniably establish the doctrine of the immortality of the human soul; nor can we presume to assert, in contradiction to Mr Gibbon, that their arguments could impress such a conviction of this truth as might influence in a very strong degree the moral sentiments and conduct. They must, however, have produced some influence on these. Some of the most illustrious among the Heathen philosophers appear to have been so strongly impressed with the belief of the soul's immortality, and of a future state of retribution, that their general conduct was constantly and in a high degree influenced by that belief. Plato and Socrates are eminent and well-known instances. And if, in such instances as these, the belief of these truths produced such conspicuous effects; it might be fairly inferred, though we had no farther evidence, that those characters were far from being singular in this respect. It is a truth acknowledged as unquestionable in the history of arts and sciences, that wherever any one person has cultivated these with extraordinary success, some among his contemporaries will always be found to have rivalled his excellence, and a number of them to have been engaged in the same pursuits. On this occasion we may venture, without hesitation, to reason upon the same principles. When the belief of the immortality of the human soul produced such illustrious patterns of virtue as a Plato and a Socrates; it must certainly have influenced the moral sentiments and conduct of many others, although in an inferior degree. We speculate, we doubt, concerning the truth of many doctrines of Christianity; many who profess that they believe them, make this profession only because they have never considered seriously whether they be true or false. But, notwithstanding this, these truths still exert a powerful influence on the sentiments and manners of society in general. Thus, also, it appears that the doctrines of ancient philosophy concerning a future life, and even the notions concerning Olympus, Elysium, and Tartarus, which made a part of the popular superstition, *did* produce a certain influence on the sentiments and manners of the Heathens in general. That influence was often indeed inconsiderable, and not always happy; but still it was somewhat greater than Mr Gibbon seems willing to allow. Christians have been sometimes at pains to exaggerate the absurdities of Pagan superstition, in order that the advantages of Christianity might acquire new value from being contrasted with it. Here we find one who is rather disposed to be the enemy of Christianity, displaying,

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ing, and even exaggerating, those absurdities for a very different purpose. But the truth may be safely admitted; it is only when exaggerated that it can serve any purpose inimical to the sacred authority of our holy religion. Mr Gibbon certainly represents the religious doctrine of the ancient Gauls, in respect to the immortality of the human soul and a future state, in too favourable a light. It is only because the whole system of superstition which prevailed among those barbarians is so imperfectly known, that it has been imagined to consist of more sublime doctrines than those of the popular superstition of the Greeks and Romans. The evidence which Mr Gibbon adduces in proof of what he asserts concerning these opinions of the ancient Gauls, is partial, and far from satisfactory. They *did* indeed assert and believe the soul to be immortal; but this doctrine was blended among a number of absurdities much grosser than those which characterize the popular religion of the Greeks and Romans. The latter was the superstition of a civilized people, among whom reason was unfolded and improved by cultivation, and whose manners were polished and liberal; the former was that of barbarians, among whom reason was, as it were, in its infancy, and who were strangers to the improvements of civilization. When hasty observers found that those barbarians were not absolutely strangers to the idea of immortality, they were moved to undue admiration; their surprise at finding what they had not expected, confounded their understanding, and led them to misconceive and misrepresent. What we ought to ascribe to the savage ferocity of the character of those rude tribes, has been attributed by mistake to the influence of their belief of a future state.

In the law of Moses, it must be allowed, that this doctrine is not particularly explained nor earnestly inculcated. The author of the Divine Legation of Moses, &c. has founded upon this fact an ingenious theory, which we shall elsewhere have occasion to examine. The reasons why this doctrine was not more fully explained to the Jews, we cannot pretend to assign, at least in this place; yet we cannot help thinking, that it was more generally known among the Jews than Mr Gibbon and the author of the Divine Legation are willing to allow. Though it be not strongly inculcated in their *code of laws*, yet there is some reason to think that it was known and generally prevalent among them long before the Babylonish captivity; even in different passages in the writings of Moses, it is mentioned or alluded to in an unequivocal manner. In the history of the patriarchs, it appears that this doctrine was known to *them*; it appears to have had a strong influence on the mind of Moses himself. Was David, was Solomon, a stranger to this doctrine? We cannot here descend to very minute particulars; but surely all the efforts of ingenuity must be insufficient to torture the sacred Scriptures of the Old Testament, so as to prove that they contain nothing concerning the doctrine of a future state any where but in the writings of the later prophets, and that even in these it is only darkly insinuated. Were the Jews, in the earlier part of their history, so totally secluded from all intercourse with other nations, that a doctrine of so much importance, more or less known to all around, could not be communicated to them? The Pharisees *did* admit traditions, and set upon them

an undue value; yet they appear to have been considered as the most orthodox of the different sects which prevailed among the Jews: the Sadducees were rather regarded as innovators.

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But though we are of opinion, that this ingenious writer allows to the doctrine of the Greek and Roman philosophers, concerning the immortality of the human soul, as well as to the notions concerning a future state, which made a part of the popular superstitions of those nations, less influence on the moral sentiments and conduct of mankind than what they really exerted; though we cannot agree with him in allowing the ideas of the immortality of the soul and of a future state, which were entertained by the Gauls and some other rude nations, to have been much superior in their nature, or much happier in their influence, than those of the Greeks and Romans; and though, in consequence of reading the Old Testament, we are disposed to think that the Jews knew somewhat more concerning the immortality of the human soul, and concerning the future state in which human beings are destined to exist, than Mr Gibbon represents them to have known: yet still we are very sensible, and very well pleased to admit, that "life and immortality were brought to light through the gospel."

The doctrine of a future life, as it was preached by the first Christians, was established on a more solid basis than that on which it had been before maintained; was freed from every absurdity; and was, in short, so much improved, that its influence, which, as it was explained by Heathen poets and philosophers, must be confessed to have been in many instances doubtful, now became favourable only to the interests of piety and virtue, and to them in a very high degree. It undoubtedly contributed to the successful propagation of Christianity; for it was calculated to attract and please both the speculating philosopher and the simple unenlightened votary of the vulgar superstition. The views which it exhibited were distinct; and all was plausible and rational, and demonstrated by the fullest evidence. But the happiness which it promised was of a less sensual nature than the enjoyments which the Heathens expected on Olympus or in Elysium; and would therefore appear less alluring to those who were not very capable of refined ideas, or preferred the gratifications of the senses in the present life to every other species of good. If the first Christians rejoiced in the hope of beholding all the votaries of Pagan idolatry afflicted with the torments of hell in a future state, and boasted of these hopes with inhuman exultation, they would in all probability rather irritate than alarm those whom they sought to convert from that superstition: the Heathens would be moved to regard with indignant scorn the preacher who pretended that those whom they venerated as gods, heroes, and wise men, were condemned to a state of unspeakable and lasting torment. Would not every feeling of the heart revolt against the idea, that a parent, a child, a husband, a wife, a friend, a lover, or a mistress, but lately lost, and still lamented, was consigned to eternal torments for actions and opinions which they had deemed highly agreeable to superior powers?

We may conclude, then, with respect to the influence of this secondary cause in promoting the propagation of Christianity, that the circumstances of the Heathen

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Heathen world were less favourable to that influence than Mr Gibbon pretends; that the means by which he represents the primitive Christians, as improving its efficacy, were some of them not employed, and others rather likely to weaken than to strengthen it; and that therefore more is attributed to the operation of this cause than it could possibly produce.

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Cause III.

The *third cause*, the miraculous powers of the primitive church, is with good reason represented as having conducted very often to the conviction of infidels. Mr Gibbon's reasonings under this head are, That numerous miraculous works of the most extraordinary kind were ostentatiously performed by the first Christians: that, however, from the difficulty of fixing the period at which miraculous powers ceased to be communicated to the Christian church, and from some other circumstances, there is reason to suspect them to have been merely the pretences of imposture; but this (to use a phrase of his own) is only darkly insinuated: and, lastly, that the Heathens having been happily prepared to receive them as real by the many wonders nearly of a similar nature to which they were accustomed in their former superstition, the miracles which the first Christians employed to give a sanction to their doctrines, contributed in the most effectual manner to the propagation of Christianity.

25
Observations in reply.

In reply to what is here advanced, it may be suggested, that the miracles recorded in the New Testament, as having been performed by the first Christians when engaged in propagating their religion, as well as a number of others recorded by the Fathers, are established as true, upon the most indubitable evidence which human testimony can afford for any fact. Mr Hume, who was too fond of employing his ingenuity in undermining truths generally received, has endeavoured to prove, that no human testimony, however strong and unexceptionable, can afford sufficient evidence of the reality of a miracle. But his reasonings on this head, which once excited doubt and wonder, have been since completely refuted; and mankind still continue to acknowledge, that though we are all liable to mistakes and capable of deceit, yet human testimony may afford the most convincing evidence of the most extraordinary and even supernatural facts. The reader will not expect us to enter, in this place, into a particular examination of the miracles of our Saviour and his apostles, and the primitive church. An inquiry into these will be a capital object in another part of this work (THEOLOGY.) We may here consider it as an undeniable and a generally acknowledged fact, that a certain part of those miracles were real. Such as were real undoubtedly contributed, in a very eminent manner, to the propagation of Christianity; but they are not to be ranked among the natural and *secondary* causes.

It is difficult to distinguish at what period miraculous gifts ceased to be conferred on the members of the primitive church; yet we may distinguish, if we take pains to inquire with minute attention, at what period the evidence ceases to be satisfactory. We can also, by considering the circumstances of the church through the several stages of its history, form some judgment concerning the period during which the gifts of prophesying, and speaking with tongues, and working mi-

racles, were most necessary to Christians to enable them to assert the truth and dignity of their religion.

The Heathens were no strangers to pretended miracles and prophecies, and other seeming interpositions of superior beings, disturbing the ordinary course of nature and of human affairs: but the miracles to which they were familiarized had been so often detected to be tricks of imposture or pretences of mad enthusiasm, that, instead of being prepared to witness or to receive accounts of new miracles with easy credulity, they must have been in general disposed to view them with jealousy and suspicion. Besides, the miracles to which they had been accustomed, and those performed by the apostles and the first preachers of Christianity, were directly contradictory; and therefore the one could receive no assistance from the other.

Yet we must acknowledge, notwithstanding what we have above advanced, that as disagreements with respect to the principles and institutions of their religion very early arose among Christians; so they likewise sought to extend its influence, at a very early period, by the use of *pious frauds*. Pious frauds, too, appear to have sometimes served the immediate purposes for which they were employed, though eventually they have been highly injurious to the cause of Christianity.

We conclude, then, that Christianity was indebted to the influence of miracles in a considerable degree to its propagation: but that the real miracles of our Saviour and his apostles, &c. were not among the *secondary* causes of its success: that the Heathens who were to be converted were not very happily prepared for receiving the miracles of the gospel with blind credulity: that, as it is possible to discern between sufficient and insufficient evidence, so it is not more difficult to distinguish between true and false miracles: and, lastly, that false miracles were soon employed by Christians as engines to support and propagate their religion, and perhaps not unsuccessfully; but were, upon the whole, more injurious than serviceable to the cause which they were called in to maintain.

The *fourth of this series of secondary causes*, which this author thinks to have been adequate to the propagation of Christianity, is the virtues of the primitive Christians. These he is willing to attribute to other and less generous motives, rather than to the pure influence of the doctrines and precepts of their religion.

The first converts to Christianity were most of them from among the lowest and most worthless characters. The wise, the mighty, and those who were distinguished by specious virtues, were in general perfectly satisfied with their present circumstances and future prospects. People whose minds were naturally weak, unenlightened, or oppressed with the sense of atrocious guilt, and who were infamous or outcasts from society, were eager to grasp at the hopes which the gospel held out to them.

When, after enlisting under the banner of Christ, they began to consider themselves as "born again to newness of life;" remorse and fear, which easily prevail over weak minds; selfish hopes of regaining their reputation, and attaining to the honours and happiness of those mansions which Jesus was said to have gone to prepare; with a desire to raise the honour and extend

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the influence of the society of which they were become members; all together operated so powerfully as to enable them to display both active and passive virtue in a very extraordinary degree. Their virtues did not flow from the purest and noblest source; yet they attracted the notice and moved the admiration of mankind. Of those who admired, some were eager to imitate; and, in order to that, thought it necessary to adopt the same principles of action.

Their virtues, too, were rather of that species which excite wonder, because uncommon, and not of essential utility in the ordinary intercourse of society; than of those which are indispensably necessary to the existence of social order, and contribute to the ease and convenience of life. Such virtues were well calculated to engage the imitation of those who had failed egregiously in the practice of the more social virtues.

Thus they practised extraordinary, but useless and unsocial virtues, upon no very generous motives; those virtues drew upon them the eyes of the world, and induced numbers to embrace their faith.

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We must, however unwillingly, declare, that this is plainly an uncandid account of the virtues of the primitive Christians, and the motives from which they originated. The social virtues are strongly recommended through the gospel. No degree of mortification or self-denial, or seclusion from the ordinary business and amusements of social life, was required of the early converts to Christianity; save what was indispensably necessary to wean them from the irregular habits in which they had before indulged, and which had rendered them nuisances in society, and to form them to new habits equally necessary to their happiness and their usefulness in life. We allow that they practised virtues which in other circumstances would, however splendid, have been unnecessary. But in the difficult circumstances in which the first Christians were placed, the virtues which they practised were in the highest degree social. The most prominent feature in their character was, "their continuing to entertain sentiments of generous benevolence, and to discharge scrupulously all the social duties," towards those who exercised neither charity nor humanity, and frequently not even bare integrity and justice, in their conduct towards them.

It cannot be said with truth, that such a proportion of the primitive Christians were people whose characters had been infamous and their circumstances desperate, as that the character of the religion which they embraced can suffer from this circumstance. Nor were they *only* the weak and illiterate whom the apostles and their immediate successors converted by their preaching. The criminal, to be sure, rejoiced to hear that he might obtain absolution of his crimes; the mourner was willing to receive comfort; minds of refined and generous feelings were deeply affected with that goodness which had induced the Son of God to submit to the punishment due to sinners: but the simplicity, the rationality, and the beauty of the Christian system, likewise prevailed in numerous instances over the pride and prejudices of the great and the wise: in so many instances, as are sufficient to vindicate the Christian church from the aspersion by which it has been represented, as being in the first period of its existence merely a body of *criminals and idiots*.

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The principles, too, from which the virtues of the first Christians originated, were not peculiarly mean and selfish; nay, they seem to have been uncommonly sublime and disinterested. Remorse in the guilty mind is a natural and reasonable sentiment; the desire of happiness in every human breast is equally so. It is uncandid to cavil against the first Christians for being, like the rest of mankind, influenced by these sentiments: And when we behold them overlooking temporary possessions and enjoyments, extending their views to futurity, and "living by faith;" when we observe them "doing good to those who hated them, blessing those who cursed them, and praying for those by whom they were despitefully used:" can we deny their virtues to have been of the most generous and disinterested kind?

We allow, then, that the virtues of the first Christians must have contributed to the propagation of their religion: but it is with pain that we observe this respectable writer studiously labouring to misrepresent the principles from which those virtues arose; and not only the principles from which they arose, but also their importance in society.

The *fifth cause* was the mode of church government adopted by the first Christians, by which they were knit together in one society; who preferred the church and its interests to their country and civil concerns. We wish not to deny, that the mutual attachment of the primitive Christians contributed to spread the influence of their religion; and the order which they maintained, in consequence of being animated with this spirit of brotherly love, and with such ardent zeal for the glory of God, must no doubt have produced no less happy effects among them than order and regularity produce on every other occasion on which they are strictly observed. But whether the form of church-government, which was gradually established in the Christian church, was actually the happiest that could possibly have been adopted; or whether, by establishing a distinct society, with separate interests, within the Roman empire, it contributed to the dissolution of that mighty fabric, we cannot here pretend to inquire. These are subjects of discussion, with respect to which we may with more propriety endeavour to satisfy our readers elsewhere.

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From the whole of this review of what Mr Gibbon has so speciously advanced concerning the influence of these five secondary causes in the propagation of the gospel, we think ourselves warranted to conclude, That the zeal of the first Christians was not, as he represents it, intolerant: That the doctrine of the immortality of the human soul was somewhat better understood in the heathen world, particularly among the Greeks and Romans and the Jews, than he represents it to have been; and had an influence somewhat happier than what he ascribes to it: That the additional circumstances by which, he tells us, the first preachers of Christianity improved the effects of this doctrine, were far from being calculated to allure converts: That the heathens, therefore, were not quite so well prepared for an eager reception of this doctrine as he would persuade us they were; and, of consequence, could not be influenced by it in so considerable a degree in their conversion: That real, unquestionable miracles, performed by our Saviour, by his apostles, and
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Christians. by their successors, *did* contribute signally to the propagation of Christianity; but are not to be ranked among the secondary causes: That weakness and blind zeal did at times employ pretended miracles for the same purpose not altogether ineffectually: That though these despicable and wicked means might be in some instances successful; yet they were, upon the whole, much more injurious than beneficial: That the virtues of the primitive Christians arose from the most generous and noble motives, and were in their nature and tendency highly favourable to social order, and to the comfort of mankind in the social state: And, lastly, That the order and regularity of church-government, which were gradually established among the first Christians, contributed greatly to maintain the dignity and spread the influence of their religion; but do not appear to have disjoined them from their fellow-subjects, or to have rendered them inimical to the welfare of the state of which they were members.

Upon the whole, then, we do not see that these secondary causes were equal to the effects that have been ascribed to them; and it seems undeniable, that others of a superior kind co-operated with them. We earnestly recommend to the perusal of the reader a valuable performance of Lord Hailes's, in which he inquires into Mr Gibbon's assertions and reasonings, concerning the influence of these five causes, with the utmost accuracy of information, strength, and clearness of reasoning, and elegant simplicity of style, and without virulence or passion.

CHRISTIANS, those who profess the religion of Christ: See CHRISTIANITY and MESSIAH.—The name *Christian* was first given at Antioch, in the year 42, to such as believed in Christ, as we read in the Acts: till that time they were called *disciples*.

The first Christians distinguished themselves in the most remarkable manner by their conduct and their virtues. The faithful, whom the preaching of St Peter had converted, hearkened attentively to the exhortations of the Apostles, who failed not carefully to instruct them, as persons who were entering upon an entirely new life. They went every day to the temple with one heart and one mind, and continued in prayers; doing nothing different from the other Jews, because it was yet not time to separate from them. But they made a still greater progress in virtue; for they sold all that they possessed, and distributed their goods in proportion to the wants of their brethren. They *ate their meat with gladness and singleness of heart, praising God, and having favour with all the people*. St Chrysostom, examining from what source the eminent virtue of the first Christians flowed, ascribes it principally to their divesting themselves of their possessions: "For (says that father) persons from whom all that they have is taken away, are not subject to sin: whereas, whoever has large possessions, wants not a devil or a tempter to draw him into hell by a thousand ways."

The Jews were the first and the most inveterate enemies the Christians had. They put them to death as often as they had it in their power: and when they revolted against the Romans in the time of the emperor Adrian, Barchochebas, the head of that revolt, employed against the Christians the most rigorous punishments to compel them to blaspheme and

renounce Jesus Christ. And we find that, even in the third century, they endeavoured to get into their hands Christian women, in order to scourge and stone them in their synagogues. They cursed the Christians solemnly three times a-day in their synagogues, and their rabbins would not suffer them to converse with Christians upon any occasion. Nor were they contented to hate and detest them; but they despatched emissaries all over the world to defame the Christians, and spread all sorts of calumnies against them. They accused them, among other things, of worshipping the sun and the head of an ass. They reproached them with idleness, and being an useless race of people. They charged them with treason, and endeavouring to erect a new monarchy against that of the Romans. They affirmed, that, in celebrating their mysteries, they used to kill a child and eat its flesh. They accused them of the most shocking incests, and of intemperance in their feasts of charity. But the lives and behaviour of the first Christians were sufficient to refute all that was said against them, and evidently demonstrated that these accusations were mere calumny and the effect of inveterate malice.

Pliny the younger, who was governor of Pontus and Bithynia between the years 103 and 105, gives a very particular account of the Christians in that province, in a letter which he wrote to the emperor Trajan, of which the following is an extract: "I take the liberty, Sir, to give you an account of every difficulty which arises to me. I have never been present at the examination of the Christians; for which reason I know not what questions have been put to them, nor in what manner they have been punished. My behaviour towards those who have been accused to me has been this: I have interrogated them, in order to know whether they were really Christians. When they have confessed it, I have repeated the same question two or three times, threatening them with death if they did not renounce this religion. Those who have persisted in their confession, have been, by my order, led to punishment. I have even met with some Roman citizens guilty of this phrensy, whom, in regard to their quality, I have set apart from the rest, in order to send them to Rome. These persons declare, that their whole crime, if they are guilty, consists in this; that, on certain days, they assemble before sunrise, to sing alternately the praises of Christ, as of a God, and to oblige themselves, by the performance of their religious rites, not to be guilty of theft, or adultery, to observe inviolably their word, and to be true to their trust. This deposition has obliged me to endeavour to inform myself still farther of this matter, by putting to the torture two of their women-servants, whom they call *deaconesses*: but I could learn nothing more from them, than that the superstition of these people is as ridiculous as their attachment to it is astonishing."

There is extant a justification, or rather panegyric, of the Christians, pronounced by the mouth of a Pagan prince. It is a letter of the emperor Antoninus, written in the year 152, in answer to the States of Asia, who had accused the Christians of being the cause of some earthquakes which had happened in

Christians that part of the world. The emperor advises them to "take care, lest, in torturing and punishing those whom they accused of Atheism (meaning the Christians), they should render them more obstinate, instead of prevailing upon them to change their opinion; since their religion taught them to suffer with pleasure for the sake of God." As to the earthquakes which had happened, he put them in mind, "that they themselves are always discouraged, and sink under such misfortunes; whereas the Christians never discovered more cheerfulness and confidence in God than upon such occasions." He tells them, that "they pay no regard to religion, and neglect the worship of the Eternal; and, because the Christians honour and adore Him, therefore they are jealous of them, and persecute them even to death." He concludes: "Many of the governors of provinces have formerly written to my father concerning them; and his answer always was, that they should not be molested or disturbed, provided they quietly submitted to the authority of the government. Many persons have likewise consulted me upon this affair, and I have returned the same answer to them all; namely, that if any one accuses a Christian merely on account of his religion, the accused person shall be acquitted, and the accuser himself punished." This ordinance, according to Eusebius, was publicly fixed up at Ephesus in an assembly of the states.

It is no difficult matter to discover the causes of the many persecutions to which the Christians were exposed during the three first centuries. The purity of the Christian morality, directly opposite to the corruption of the Pagans, was doubtless one of the most powerful motives of the public aversion. To this may be added, the many calumnies unjustly spread about concerning them by their enemies, particularly the Jews. And this occasioned so strong a prejudice against them, that the Pagans condemned them without inquiring into their doctrine, or permitting them to defend themselves. Besides, their worshipping Jesus Christ, as God, was contrary to one of the most ancient laws of the Roman empire, which expressly forbade the acknowledging of any God which had not been approved by the senate.

But notwithstanding the violent opposition made to the establishment of the Christian religion, it gained ground daily, and very soon made a surprising progress in the Roman empire. In the third century, there were Christians in the camp, in the senate, in the palace: in short everywhere, but in the temples and the theatres: they filled the towns, the country, the islands. Men and women of all ages and conditions, and even those of the first dignities, embraced the faith; inasmuch that the Pagans complained that the revenues of their temples were ruined. They were in such great numbers in the empire, that (as Tertullian expresses it) were they to have retired into another country, they would have left the Romans only a frightful solitude.

The primitive Christians were not only remarkable for the practice of every virtue; they were also very eminently distinguished by the many miraculous gifts and graces bestowed by God upon them. "Some of the Christians (says Irenæus) drive out devils, not in appearance only, but so as that they never return;

when it often happens, that those who are possessed of evil spirits embrace the faith and are received into the church. Others know what is to come, see visions, and deliver oracles as prophets. Others heal the sick by laying their hands on them, and restore them to perfect health: and we find some who even raise the dead.—It is impossible to reckon up the gifts and graces which the church has received from God—what they have freely received they as freely bestow. They obtain these gifts by prayer alone, and invocation of the name of Jesus Christ, without any mixture of enchantment or superstition."

We shall here subjoin the remarkable story, attested by Pagan authors themselves, concerning the *Christian Legion* in the army of the emperor Marcus Aurelius. That prince having led his forces against the Quadi, a people on the other side of the Danube, was surrounded and hemmed in by the enemy in a disadvantageous place, and where they could find no water. The Romans were greatly embarrassed, and, being pressed by the enemy, were obliged to continue under arms, exposed to the violent heat of the sun, and almost dead with thirst; when, on a sudden, the clouds gathered, and the rain fell in great abundance. The soldiers received the water in their bucklers and helmets, and satisfied both their own thirst and that of their horses. The enemy, presently after, attacked them; and so great was the advantage they had over them, that the Romans must have been overthrown, had not heaven again interposed by a violent storm of hail, mixed with lightning, which fell on the enemy, and obliged them to retreat. It was found afterwards, that one of the legions, which consisted of Christians, had by their prayers, which they offered up on their knees before the battle, obtained this favour from heaven: and from this event that legion was surnamed *The Thundering Legion*. See, however, the criticism of Mr Moyle on this story in his *Works*, vol. ii. p. 81.—390. See also *Mosheim's Church History*, vol. i. p. 124.

Such were the primitive Christians, whose religion has by degrees spread itself over all parts of the world, though not with equal purity in all. And though, by the providence of God, Mahometans and Idolaters have been suffered to possess themselves of those places in Greece, Asia, and Africa, where the Christian religion formerly most flourished; yet there are still such remains of the Christian religion among them as to give them opportunity sufficient to be converted. For, in the dominions of the Turk in Europe, the Christians make two third parts at least of the inhabitants; and in Constantinople itself there are above twenty Christian churches, and above thirty in Thessalonica. Philadelphia, now called *Ala Shabir*, has no fewer than twelve Christian churches. The whole island of Chio is governed by Christians; and some islands of the Archipelago are inhabited by Christians only. In Africa, besides the Christians living in Egypt, and in the kingdom of Congo and Angola, the islands upon the western coasts are inhabited by Christians; and the vast kingdom of Abyssinia, supposed to be as big as Germany, France, Spain, and Italy, put together, is possessed by Christians. In Asia, most part of the empire of Russia, the countries of Circassia and Mingrelia, Georgia, and Mount Libanus, are inhabited

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habited only by Christians. In America, it is notorious that the Christians are very numerous, and spread over most parts of that vast continent.

CHRISTIANS of St John, a sect of Christians very numerous in Balfara and the neighbouring towns: they formerly inhabited along the river Jordan, where St John baptized, and it was from thence they had their name. They hold an anniversary feast of five days; during which they all go to the bishop, who baptizes them with the baptism of St John. Their baptism is also performed in rivers, and that only on Sundays: they have no notion of the third person in the Trinity; nor have they any canonical book, but abundance full of charms, &c. Their bishoprics descend by inheritance, as our estates do, though they have the ceremony of an election.

CHRISTIANS of St Thomas, a sort of Christians in a peninsula of India on this side of the gulf: they inhabit chiefly at Cranganor, and the neighbouring country: these admit of no images; and receive only the cross, to which they pay a great veneration: they affirm, that the souls of the saints do not see God till after the day of judgment: they acknowledge but three sacraments, viz. baptism, orders, and the eucharist; they make no use of holy oils in the administration of baptism; but, after the ceremony, anoint the infant with an unction composed of oil and walnuts, without any benediction. In the eucharist, they consecrate with little cakes made of oil and salt, and instead of wine make use of water in which raisins have been infused.

CHRISTIANA, a town of Norway, in the province of Aggerhuys, situated on a bay of the sea. E. Long. 10. 20. N. Lat. 59. 30.

CHRISTIANOPLE, a port-town of Sweden, situated on the Baltic sea, in the territory of Bleckingen, and province of South Gothland. E. Long. 15. 47. N. Lat. 57°.

CHRISTIANSTADT, a strong fortified town of Sweden; situated in the territory of Bleckingen and province of South Gothland. It was built in 1614 by Christian IV. king of Denmark, when this province belonged to the Danes; and finally ceded to the Swedes by the peace of Roskild in 1658. The town is small but neatly built, and is esteemed the strongest fortress in Sweden. The houses are all of brick, and mostly stuccoed white. It stands in a marshy plain close to the river Helge-a, which flows into the Baltic at Ahus, about the distance of 20 miles, and is navigable only for small craft of seven tons burden. English vessels annually resort to this port for alum, pitch, and tar. The inhabitants have manufactures of cloth and silken stuffs, and carry on a small degree of commerce. E. Long. 14. 40. N. Lat. 56. 30.

CHRISTINA, daughter of Gustavus Adolphus king of Sweden, was born in 1626; and succeeded to the crown in 1633, when only seven years of age. This princess discovered even in her infancy, what she afterwards expressed in her memoirs, an invincible antipathy for the employments and conversation of women; and she had the natural awkwardness of a man with respect to all the little works which generally fall to their share. She was, on the contrary, fond of violent exercises, and such amusements as consist in feats of strength and activity. She had also both ability and

taste for abstracted speculations; and amused herself with language and the sciences, particularly that of legislation and government. She derived her knowledge of ancient history from its source; and Polybius and Thucydides were her favourite authors. As she was the sovereign of a powerful kingdom, it is not strange that almost all the princes in Europe aspired to her bed. Among others, were the prince of Denmark, the elector Palatine, the elector of Brandenburg, the king of Spain, the king of the Romans, Don John of Austria, Sigismund of Rockocci, count and general of Cassovia; Stanislaus king of Poland; John Cassimir his brother; and Charles Gustavus duke of Deux Ponts, of the Bavarian Palatinate family, son of her father the great Gustavus's sister, and consequently her first cousin. To this nobleman, as well as to all his competitors, she constantly refused her hand; but she caused him to be appointed her successor by the states. Political interests, differences of religion, and contrariety of manners, furnished Christina with pretences for rejecting all her suitors; but her true motives were the love of independence, and a strong aversion she had conceived, even in her infancy, from the marriage yoke. "Do not force me to marry (said she to the states); for if I should have a son, it is not more probable that he should be an Augustus than a Nero."

An accident happened in the beginning of her reign, which gave her a remarkable opportunity of displaying the strength and equanimity of her mind. As she was at the chapel of the castle of Stockholm, assisting at divine service with the principal lords of her court, a poor wretch, who was disordered in his mind, came to the place with a design to assassinate her. This man, who was preceptor of the college, and in the full vigour of his age, chose, for the execution of his design, the moment in which the assembly was performing what in the Swedish church is called an *act of recollection*; a silent and separate act of devotion, performed by each individual kneeling and hiding the face with the hand. Taking this opportunity, he rushed through the crowd, and mounted a ballustrade within which the queen was upon her knees. The Baron Braki, chief justice of Sweden, was alarmed, and cried out; and the guards crossed their partisans, to prevent his coming further: but he struck them furiously on one side; leaped over the barrier; and, being then close to the queen, made a blow at her with a knife which he had concealed without a sheath in his sleeve. The queen avoided the blow, and pushed the captain of her guards, who instantly threw himself upon the assassin, and seized him by the hair. All this happened in less than a moment of time. The man was known to be mad, and therefore nobody supposed he had any accomplices: they therefore contented themselves with locking him up; and the queen returned to her devotion without the least emotion that could be perceived by the people, who were much more frightened than herself.

One of the great affairs that employed Christina while she was upon the throne, was the peace of Westphalia, in which many clashing interests were to be reconciled, and many claims to be ascertained. It was concluded in the month of October 1648. The success of the Swedish arms rendered Christina the arbitress

Christina. bitress of this treaty; at least as to the affairs of Sweden, to which this peace confirmed the possession of many important countries. No public event of importance took place during the rest of Christina's reign; for there were neither wars abroad, nor troubles at home. This quiet might be the effect of chance; but it might also be the effect of a good administration, and the great reputation of the queen; and the love her people had for her ought to lead us to this determination. Her reign was that of learning and genius. She drew about her, wherever she was, all the distinguished characters of her time: Grotius, Paschal, Bochart, Descartes, Gassendi, Saumaïse, Naude, Vossius, Heinsius, Meibom, Scudery, Menage, Lucas, Holstentius, Lambecius, Bayle, Madam Dacier, Filicaia, and many others. The arts never fail to immortalize the prince who protects them; and almost all these illustrious persons have celebrated Christina, either in poems, letters, or literary productions of some other kind, the greater part of which are now forgotten. They form, however, a general cry of praise, and a mass of testimonials which may be considered as a solid basis of reputation. Christina, however, may be justly reproached with want of taste, in not properly assigning the rank of all these persons, whose merits, though acknowledged, were yet unequal; particularly for not having been sufficiently sensible of the superiority of Descartes, whom she disgusted, and at last wholly neglected. The rapid fortune which the adventurer Michon, known by the name of *Bourdelot*, acquired by her countenance and liberality, was also a great scandal to literature. He had no pretensions to learning; and though sprightly was yet indecent. He was brought to court by the learned Saumaïse; and, for a time, drove literary merit out of it, making learning the object of his ridicule, and exacting from Christina an exorbitant tribute to the weakness and inconstancy of her sex; for even Christina, with respect to this man, showed herself to be weak and inconstant. At last she was compelled, by the public indignation, to banish this unworthy minion: and he was no sooner gone, than her regard for him was at an end. She was ashamed of the favour she had shown him; and, in a short time, thought of him with hatred or contempt. This *Bourdelot*, during his ascendancy over the queen, had supplanted Count Magnus de la Gardie, son of the constable of Sweden, who was a relation, a favourite, and perhaps the lover of Christina. M. de Mottville, who had seen him ambassador in France, says, in his memoirs, that he spoke of his queen in terms so passionate and respectful, that every one concluded his attachment to her to be more ardent and tender, than a mere sense of duty can produce. This nobleman fell into disgrace because he showed an inclination to govern; while M. *Bourdelot* seemed to aim at nothing more than to amuse; and concealed, under the unsuspected character of a droll, the real ascendancy which he exercised over the queen's mind.

About this time, an accident happened to Christina which brought her into still greater danger than that which has been related already. Having given orders for some ships of war to be built at the port of Stockholm, she went to see them when they were finished; and as she was going on board of them, cross

Christina. a narrow plank, with Admiral Fleming, his foot slipping, he fell, and drew the queen with him into the sea, which in that place was near 90 feet deep. Anthony Steinberg, the queen's first equerry, instantly threw himself into the water, laid hold of her robe, and, with such assistance as was given him, got the queen ashore: during this accident, her recollection was such, that the moment her lips were above water, she cried out, "Take care of the admiral." When she was got out of the water, she discovered no emotion either by her gesture or countenance; and she dined the same day in public, where she gave a humorous account of her adventure.

But though at first she was fond of the power and splendor of royalty, yet she began at length to feel that it embarrassed her; and the same love of independence and liberty which had determined her against marriage, at last made her weary of the crown. As, after her first disgust, it grew more and more irksome to her, she resolved to abdicate; and, in 1652, communicated her resolution to the senate. The senate zealously remonstrated against it; and was joined by the people; and even by Charles Gustavus himself, who was to succeed her: she yielded to their importunities, and continued to sacrifice her own pleasure to the will of the public till the year 1654, and then she carried her design into execution. It appears by one of her letters to M. Canut, in whom she put great confidence, that she had meditated this project for more than eight years; and that she had communicated it to him five years before it took place.

The ceremony of her abdication was a mournful solemnity, a mixture of pomp and sadness, in which scarce any eyes but her own were dry. She continued firm and composed through the whole; and, as soon as it was over, prepared to remove into a country more favourable to science than Sweden was. Concerning the merit of this action, the world has always been divided in opinion; it has been condemned alike both by the ignorant and the learned, the trifler and the sage. It was admired, however, by the great Conde: "How great was the magnanimity of this princess (said he), who could so easily give up that for which the rest of mankind are continually destroying each other, and which so many throughout their whole lives pursue without attaining!" It appears, by the works of St Evremond, that the abdication of Christina was at that time the universal topic of speculation and debate in France. Christina, besides abdicating her crown, abjured her religion: but this act was universally approved by one party and censured by another; the Papists triumphed, and the Protestants were offended. No prince, after a long imprisonment, ever showed so much joy upon being restored to his kingdom, as Christina did in quitting hers. When she came to a little brook, which separates Sweden from Denmark, she got out of her carriage; and leaping on the other side, cried out in a transport of joy, "At last I am free, and out of Sweden, whither, I hope, I shall never return." She dismissed her women, and laid by the habit of her sex: "I would become a man (said she); yet I do not love men because they are men, but because they are not women." She made her abjuration at Brussels; where she saw the great Conde, who, after his

Christina. his defection, made that city his asylum. "Cousin (said she), who would have thought, ten years ago, that we should have met at this distance from our countries?"

The inconstancy of Christina's temper appeared in her going continually from place to place: from Brussels she went to Rome; from Rome to France, and from France she returned to Rome again; after this she went to Sweden, where she was not very well received; from Sweden she went to Hamburg, where she continued a year, and then went again to Rome; from Rome she returned to Hamburg; and again to Sweden, where she was still worse received than before; upon which she went back to Hamburg, and from Hamburg again to Rome. She intended another journey to Sweden; but it did not take place, any more than an expedition to England, where Cromwell did not seem well disposed to receive her; and after many wanderings, and many purposes of wandering still more, she at last died at Rome in 1689.

It must be acknowledged, that her journeys to Sweden had a motive of necessity; for her appointments were very ill paid, though the states often confirmed them after her abdication: but to other places she was led merely by a roving disposition; and, what is more to her discredit, she always disturbed the quiet of every place she came into, by exacting greater deference to her rank as queen than she had a right to expect, by her total non-conformity to the customs of the place, and by continually exciting and fomenting intrigues of state. She was indeed always too busy, even when she was upon the throne; for there was no event in Europe in which she was not ambitious of acting a principal part. During the troubles in France by the faction called the *Fronde*, she wrote with great eagerness to all the interested parties, officiously offering her mediation to reconcile their interests, and calm their passions, the secret springs of which it was impossible she should know. This was first thought a dangerous, and afterwards a ridiculous behaviour. During her residence in France she gave universal disgust, not only by violating all the customs of the country, but by practising others directly opposite. She treated the ladies of the court with the greatest rudeness and contempt: when they came to embrace her, she, being in man's habit, cried out, "What a strange eagerness have these women to kiss me! is it because I look like a man?"

But though she ridiculed the manners of the French court, she was very solicitous to enter into its intrigues. Louis XIV. then very young, was enamoured of Mademoiselle de Mancini, niece to Cardinal Mazarine; Christina flattered their passion, and offered her service. "I would fain be your confidant (said she); if you love, you must marry."

The murder of Monaldechi is, to this hour, an inscrutable mystery. It is, however, of a piece with the expressions constantly used by Christina in her letters, with respect to those with whom she was offended; for she scarce ever signified her displeasure without threatening the life of the offender. "If you fail in your duty, (said she to her secretary, whom she sent to Stockholm after her abdication), not all the power of the king of Sweden shall save your life, though you

should take shelter in his arms." A musician having quitted her service for that of the duke of Savoy, she was so transported with rage as to disgrace herself by these words, in a letter written with her own hand: "He lives only for me: and if he does not sing for me, he shall not sing long for any body."

Bayle was also threatened for having said that the letter which Christina wrote, upon the revocation of the edict of Nantes, was "a remain of Protestantism;" but he made his peace by apologies and submission. See the article *BAYLE*.

Upon the whole, she appears to have been an uncommon mixture of faults and great qualities; which, however it might excite fear and respect, was by no means amiable. She had wit, taste, parts and learning: she was indefatigable upon the throne; great in private life; firm in misfortunes; impatient of contradiction; and, except in her love of letters, inconstant in her inclinations. The most remarkable instance of this fickleness is, That after she had abdicated the crown of Sweden, she intrigued for that of Poland. She was in every action and pursuit, violent and ardent in the highest degree; impetuous in her desires, dreadful in her resentment, and fickle in her conduct.

She says of herself, that "she was mistrustful, ambitious, passionate, haughty, impatient, contemptuous, satirical, incredulous, undevout, of an ardent and violent temper, and extremely amorous;" a disposition, however, to which, if she may be believed, her pride and her virtue were always superior. In general, her failings were those of her sex, and her virtues the virtues of ours.

Santa CHRISTINA, one of the *MARQUESAS Islands*.

CHRISTMAS DAY, a festival of the Christian church; observed on the 25th of December, in memory of the *nativity* or birth of Jesus Christ. As to the antiquity of this festival, the first footsteps we find of it are in the second century, about the time of the emperor Commodus. The decretal epistles indeed carry it up a little higher; and say that Telesphorus, who lived in the reign of Antoninus Pius, ordered divine service to be celebrated, and an angelical hymn to be sung, the night before the nativity of our Saviour. However, that it was kept before the times of Constantine, we have a melancholy proof: for whilst the persecution raged under Dioclesian, who then kept his court at Nicomedia, that prince, among other acts of cruelty, finding multitudes of Christians assembled together to celebrate Christ's nativity, commanded the church doors where they were met to be shut, and fire to be put to it, which, in a short time, reduced them and the church to ashes.

CHRISTOPHER'S, ST, one of the Caribbee islands, in America, lying to the north-west of Nevis, and about 60 miles west of Antigua. It was formerly inhabited by the French and English; but, in 1713, it was ceded entirely to the latter. In 1782, it was taken by the French, but restored to Britain at the peace. It is about 20 miles in breadth, and seven in length; and has high mountains in the middle, whence rivulets run down. Between the mountains are dreadful rocks, horrid precipices, and thick woods; and in the south west part of the island, hot sulphureous springs at the foot of them. The air is good; the soil

Chroasta-
ces,
Chromatic.

light, sandy, and fruitful; but the island is subject to hurricanes. The produce is chiefly sugar, cotton, ginger, indigo, and the tropical fruits. W. Long. 62. 32. N. Lat. 17. 30.

CHROASTACES, in *Natural History*, a genus of pellucid gems, comprehending all those of variable colours, as viewed in different lights; of which kinds are the *opal* and the *asteria* or *oculus cati*. See *OPAL* and *ASTERIA*.

CHROMATIC, a kind of music which proceeds by several semitones in succession. The word is derived from the Greek *χρωμα*, which signifies colour. For this denomination several causes are assigned, of which none appear certain, and all equally unsatisfactory. Instead, therefore, of fixing upon any, we shall offer a conjecture of our own; which, however, we do not impose upon the reader as more worthy of his attention than any of the former. *χρωμα* may perhaps not only signify a colour, but that shade of a colour by which it melts into another, or what the French call *nuance*. If this interpretation be admitted, it will be highly applicable to semitones; which being the smallest interval allowed in the diatonic scale, will most easily run one into another. To find the reasons assigned by the ancients for this denomination, and their various divisions of the chromatic species, the reader may have recourse to the same article in *Rouffeau's Musical Dictionary*. At present, that species consists in giving such a procedure to the fundamental bass, that the parts in the harmony, or at least some of them, may proceed by semitones, as well in rising as descending; which is most frequently found in the minor mode, from the alterations to which the sixth and seventh note are subjected, by the nature of the mode itself.

The successive semitones used in the *chromatic* species are rarely of the same kind; but alternatively major and minor, that is to say, *chromatic* and *diatonic*: for the interval of a minor tone contains a minor or chromatic semitone, and another which is major or diatonic; a measure which temperament renders common to all tones: so that we cannot proceed by two minor semitones which are conjunctive in succession, without

entering into the enharmonic species; but two major Chromatic semitones twice follow each other in the *chromatic* order of the scale.

The most certain procedure of the fundamental bass to generate the chromatic elements in ascent, is alternately to descend by thirds, and rise by fourths, whilst all the chords carry the third major. If the fundamental bass proceeds from dominant to dominant by perfect cadences avoided, it produces the *chromatic* in descending. To produce both at once, you interweave the perfect and broken cadences, but at the same time avoid them.

As at every note in the *chromatic* species one must change the tone, that succession ought to be regulated and limited for fear of deviation. For this purpose, it will be proper to recollect, that the space most suitable to *chromatic* movements, is between the extremes of the dominant and the tonic in ascending, and between the tonic and the dominant in descending. In the major mode, one may also chromatically descend from the dominant upon the second note. This transition is very common in Italy; and, notwithstanding its beauty, begins to be a little too common amongst us.

The chromatic species is admirably fitted to express grief and affliction; these sounds boldly struck in ascending tear the soul. Their power is no less magical in descending; it is then that the ear seems to be pierced with real groans. Attended with its proper harmony, this species appears proper to express every thing: but its completion, by concealing the melody, sacrifices a part of its expression; and for this disadvantage, arising from the fulness of the harmony, it can only be compensated by the nature and genius of the movement. We may add, that in proportion to the energy of this species, the composer ought to use it with greater caution and parsimony; like those delicate viands, which, when profusely administered, immediately surfeit us with their abundance; as much as they delight us when enjoyed with temperance, so much do they disgust when devoured with prodigality.

CHROMATIC, *Enharmonic*. See *ENHARMONIC*.

C H R O M A T I C S ;

THAT part of optics which explains the several properties of the colours of light, and of natural bodies.

¹
Different
hypotheses
concerning
colours.

Before the time of Sir Isaac Newton, we find no hypothesis concerning colours of any consequence. The opinions of the old philosophers, however, we shall briefly mention, in order to gratify the curiosity of our readers. The Pythagoreans called colour the superficies of body. Plato said that it was a flame issuing from them. According to Zeno, it is the first configuration of matter; and Aristotle said, it was that which moved bodies actually transparent. Des Cartes asserted, that colour is a modification of light; but he imagined, that the difference of colour proceeds from the prevalence of the direct or rotatory motion of the particles of light. Father Grimaldi, Dechales, and

many others, thought the difference of colour depended upon the quick or slow vibrations of a certain elastic medium filling the whole universe. Rohault imagined that the different colours were made by the rays of light entering the eye at different angles with respect to the optic axis; and from the phenomena of the rainbow, he pretended to calculate the precise quantity of the angle that constituted each particular colour. Lastly, Dr Hooke, the rival of Newton, imagined that colour is caused by the sensation of the oblique or uneven pulse of light; and this being capable of no more than two varieties, he concluded there could be no more than two primary colours.

In the year 1666, Sir Isaac Newton began to investigate this subject; and finding the coloured image of the sun, formed by a glass prism, to be of an oblong, ² This subject investigated by Sir Isaac and Newton.

and not of a circular form, as, according to the laws of refraction, it ought to be, he began to conjecture that light is *homogeneous*; but that it consists of rays, some of which are much more refrangible than others. See this discovery fully explained and ascertained under the article OPTICS.

This method of accounting for the different colours of bodies, from their reflecting this or that kind of rays most copiously, is so easy and natural, that Sir Isaac's system quickly overcame all objections, and to this day continues to be almost universally believed. It is now acknowledged, that the light of the sun, which to us seems perfectly homogeneous and white, is composed of no fewer than seven different colours, viz. red, orange, yellow, green, blue, purple, and violet or indigo. A body which appears of a red colour hath the property of reflecting the red rays more powerfully than any of the others; and so of the orange, yellow, green, &c. A body which is of a black colour, instead of reflecting, *absorbs* all or the greatest part of the rays that fall upon it; and, on the contrary, a body which appears white reflects the greatest part of the rays indiscriminately, without separating the one from the other.

The foundation of a rational theory of colours being thus laid, it next became natural to inquire, by what peculiar mechanism in the structure of each particular body it was fitted to reflect one kind of rays more than another? This Sir Isaac Newton attributes to the density of these bodies. Dr Hooke had remarked, that thin transparent substances, particularly water and soap blown into bubbles, exhibited various colours according to their thinness; though, when they have a considerable degree of thickness, they appear colourless; and Sir Isaac himself had observed that as he was compressing two prisms hard together, in order to make their sides (which happened to be a little convex) to touch one another, in the place of contact they were both perfectly transparent, as if they had been but one continued piece of glass. Round the point of contact, where the glasses were a little separated from each other, rings of different colours appeared. To observe more nicely the order of the colours produced in this manner, he took two object-glasses; one of them a plano-convex one belonging to a 14 feet refracting telescope, and the other a large double convex one for a telescope of about 50 feet; and laying the former of them upon the latter, with its plain side downwards, he pressed them slowly together; by which means the colours very soon emerged, and appeared distinct to a considerable distance. Next to the pellucid central spot, made by the contact of the glasses, succeeded blue, white, yellow, and red. The blue was very little in quantity, nor could he discern any violet in it; but the yellow and red were very copious, extending about as far as the white, and four or five times as far as the blue. The next circuit immediately surrounding these, consisted of violet, blue, green, yellow, and red: all these were copious and vivid, except the green, which was very little in quantity, and seemed more faint and dilute than the other colours. Of the other four the violet was the least in extent; and the blue less than the yellow or red. The third circle of colours was purple, blue, green, yellow, and red. In this the purple seemed more reddish than

3
Colours
appearing
between
two glass
plates.

the violet in the former circuit, and the green was more conspicuous; being as brisk and copious as any of the other colours, except the yellow; but the red began to be a little faded, inclining much to purple. The fourth circle consisted of green and red; and of these the green was very copious and lively, inclining on the one side to blue, and on the other to yellow; but in this fourth circle there was neither violet, blue, nor yellow, and the red was very imperfect and dirty. All the succeeding colours grew more and more imperfect and dilute, till after three or four revolutions they ended in perfect whiteness.

As the colours were thus found to vary according to the different distances of the glass plates from each other; our author thought that they proceeded from the different thickness of the plate of air intercepted between the glasses; this plate of air being, by the mere circumstance of thinness or thickness, disposed to reflect or transmit this or that particular colour. From this he concluded, as already observed, that the colours of all natural bodies depended on their density, or the bigness of their component particles. He also constructed a table, wherein the thickness of a plate necessary to reflect any particular colour was expressed in parts of an inch divided into 1,000,000 parts.

Sir Isaac Newton, pursuing his discoveries concerning the colours of thin substances, found that the same were also produced by plates of a considerable thickness. There is no glass or speculum, he observes, how well polished soever, but, besides the light which it refracts or reflects regularly, scatters every way irregularly a faint light; by means of which the polished surface, when illuminated in a dark room by a beam of the sun's light, may easily be seen in all positions of the eye. It was with this scattered light that the colours in the following experiments were produced.

The sun shining into his darkened chamber through a hole in the shutter one inch wide, he let the beam of light fall perpendicularly upon a glass speculum concave on one side and convex on the other, ground to a sphere of five feet eleven inches radius, and quicksilver over on the convex side. Then, holding a quire of white paper at the centre of the sphere to which the speculums were ground, in such a manner as that the beam of light might pass through a little hole made in the middle of the paper, to the speculum, and thence be refracted back to the same hole, he observed on the paper four or five concentric rings of colours, like rainbows surrounding the hole, very much like those which appeared in the thin plates above-mentioned, but larger and fainter. These rings, as they grew larger and larger, became more dilute, so that the fifth was hardly visible; and yet sometimes, when the sun shone very clear, there appeared faint traces of a sixth and seventh.

We have already taken notice, that the thin plates made use of in the former experiments reflected some kinds of rays in particular parts, and transmitted others in the same parts. Hence the coloured rings appeared variously disposed, according as they were viewed by transmitted or reflected light; that is, according as the plates were held up between the light and the eye, or not. For the better understanding of

4
Supposed
to arise
from den-
sity.

5
Colours by
reflection.

6
Colours by
refraction
and reflection
enumerated.

which we subjoin the following table, wherein on one side are mentioned the colours appearing on the plates by reflected light, and on the other those which were opposite to them, and which became visible when the glasses were held up between the eye and the window. We have already observed, that the centre, when the glasses were in full contact, was perfectly transparent. This spot, therefore, when viewed by reflected light, appeared black, because it transmitted all the rays; and for the same reason it appeared white when viewed by transmitted light.

COLOURS by Reflected Light.	COLOURS by Transmitted Light.
Black	White
Blue	Yellowish-red
White	Black
Yellow	Violet
Red	Blue
Violet	White
Blue	Yellow
Green	Red
Yellow	Violet
Red	Blue
Purple	Green
Blue	Yellow
Green	Red
Yellow } Red } Green }	Bluish-green
Red	Red
Green	Bluish-green
Red	Red
Greenish-blue	
Red	

The colours of the rings produced from reflection by the thick plates, followed the order of those produced by transmission through the thin ones; and by the analogy of their phenomena with those produced from the thin plates, Sir Isaac Newton concluded that they were produced in a similar manner. For he found, that if the quicksilver was rubbed off from the back of the speculum, the glass alone would produce the same rings, but much more faint than before; so that the phenomenon did not depend upon the quicksilver, except in as far as, by increasing the reflection at the back of the glass, it increased the light of the coloured rings. He also found that a speculum of metal only, produced none of these rings; which made him conclude, that they did not arise from one surface only, but depended on the two surfaces of the plate of glass of which the speculum was made, and upon the thickness of the glass between them.

7
General
theory of
colours by
Sir Isaac
Newton.

From these experiments and observations, it will be easy to understand the Newtonian theory of colours. Every substance in nature seems to be transparent, provided it is made sufficiently thin. Gold, the most dense substance we know, when reduced into thin leaves, transmits a bluish-green light through it. If, therefore, we suppose any body, gold for instance, to be divided into a vast number of plates, so thin as to be almost perfectly transparent, it is evident that all or greatest part of the rays will pass through the upper plates, and when they lose their force will be reflected from the under ones. They will then have the same number of plates to pass through which they had penetrated before; and thus, according to the

number of those plates through which they are obliged to pass, the object appears of this or that colour, just as the rings of colours appeared different in the experiment of the two plates, according to their distance from one another, or the thickness of the plate of air between them.

This theory is adopted by Edward Hufley Delaval, ⁸ Mr Delaval's experiments in confirmation of it. in this Experimental Inquiry into the cause of the changes of colours in opaque and coloured bodies. He endeavours to confirm it by a number of experiments on the infusions of flowers of different colours; but his strongest arguments seem to be those derived from the different tinges given to glass by metallic substances. Here he observes, that each metal gives a tinge according to its specific density: the more dense metals producing the less refrangible colours, and the lighter ones those colours which are more easily refrangible. Gold, which is the densest of all metals, imparts a red colour to glass, whenever it can be divided into particles so minute, that it is capable of being mixed with the materials of which glass is made. It seems indifferent by what means it is reduced to this state, nor can it by any means be made to produce another colour. If it is mixed in large masses without being minutely divided, it imparts no colour to the glass, but remains in its metallic form. Lead, the metal whose density is next in order to that of gold, affords a glass of the colour of the hyacinth; a gem whose distinguishing characteristic is, that it is red with an admixture of yellow, the same colour which is usually called *orange*. Glass of lead is mentioned by several authors as a composition proper, without the addition of any other ingredient, for imitating the hyacinth. Silver, next in density to lead, can only be made to communicate a yellow colour to glass. If the metal is calcined with sulphur, it readily communicates this colour. Leaf-silver laid upon red-hot glass, likewise tinges it yellow. When we meet with authors who mention a blue or greenish colour communicated by silver, the cause must have been, that the silver used in such processes was mixed with copper. Mr Delaval assures us, from his own experience, that silver purified by the test retains so much copper, that, when melted several times with nitre and borax, it always imparted a green colour at the first and second melting: though afterwards no such colour was obtainable from it. The only colour produced by copper is green. It is indifferent in what manner the copper is prepared in order to tinge the glass, provided it is exposed without any other ingredient to a sufficient degree of heat. If a quantity of salts are added in the preparation, they will, by attenuating the mixture, make the glass incline to blue, the colour next in order: but this happens only when the fire is moderate; for, in a greater degree of heat, the redundant salts, even those of the most fixed nature, are expelled. It is true, that copper is mentioned by some writers as an ingredient in red glass and enamel: but the *red*, which is the colour of the metal not dissolved or mixed with the glass, remains only while the composition is exposed to such a degree of heat as is too small to melt and incorporate it; for if it be suffered to remain in the furnace a few minutes after the copper is added, the mass will turn out green instead of red. Iron, the metal next in density to copper, is apt to

to be calcined, or reduced to a ruddy crocus, similar to that rust which it contracts spontaneously in the air. In this state, it requires a considerable degree of heat to dissolve and incorporate it with glass: till that heat is applied, it retains its ruddy colour: by increasing the heat, it passes through the intermediate colours, till it arrives at its permanent one, which is blue; this being effected in the greatest degree of heat the glass will bear, without losing all colour whatever. Iron vitrified *per se* is converted into a blue glass. In short, it is indubitable, that iron is the only metal which will, without any addition, impart to the glass a blue colour: for copper will not communicate that colour without the addition of a considerable quantity of salts, or some other matter that attenuates it; and the other metals cannot by any means be made to produce it at all.

⁹
Sir Isaac's theory defended by Dr Priestley.

These are the principal of Mr Delaval's arguments in favour of Sir Isaac Newton's theory of colours being formed by density. Dr Priestley too hath mentioned some which deserve attention. "It was a discovery of Sir Isaac Newton (says he), that the colours of bodies depend upon the thickness of the fine plates which compose their surfaces. He hath shown, that a change of the thickness of these plates occasions a change in the colour of the body; rays of a different colour being thereby disposed to be transmitted through it; and consequently rays of a different colour reflected at the same place, so as to represent an image of a different colour to the eye. A variation in the density occasions a variation in the colour; but still a medium of any density will exhibit all the colours, according to the thickness of it. These observations he confirmed by experiments on plates of air, water, and glass. He likewise mentions the colours which arise on polished steel by heating it, as likewise on bell-metal, and some other metalline substances, when melted and poured on the ground, where they may cool in the open air; and he ascribes them to the scoræ or vitrified parts of the metal, which, he says, most metals, when heated or melted, do continually protrude and send out to their surfaces, covering them in the form of a thin glassy skin. This great discovery concerning the colours of bodies depending on the thickness of the fine plates which compose their surfaces, of whatever density these plates may be, I have been so happy as to hit upon a method of illustrating and confirming by means of electrical explosions. A number of these being received on the surface of any piece of metal, change the colour of it to a considerable distance from the spot on which they were discharged; so that the whole circular space is divided into a number of concentric rings, each of which consists of all the prismatic colours, and perhaps as vivid as they can be produced in any method whatever. Upon showing these coloured rings to Mr Canton, I was agreeably surprised to find, that he had likewise produced all the prismatic colours from all the metals, but by a different operation. He extended fine wires of all the different metals along the surfaces of pieces of glass, ivory, wood, &c.; and when the wire was exploded, he always found them tinged with all the colours. They are not disposed in so regular and beautiful a manner as in the rings I

¹⁰
His experiments.

¹¹
Mr Canton's experiments.

produced, but they equally demonstrated that none of the metals thus exploded discovers the least preference to one colour more than to another. In what manner these colours are formed it may not be easy to conjecture. In Mr Canton's method of producing them, the metal, or the calcined and vitrified parts of it, seem to be dispersed in all directions from the plate of explosion, in the form of spheres of a very great variety of sizes, tinged with all the variety of colours, and some of them smaller than can be distinctly seen by any magnifier. In my method of making these colours, they seem to be produced in a manner similar to the production of colours on steel and other metals by heat; i. e. the surface is affected without the parts of it being removed from their places, certain plates or laminæ being formed of a thickness proper to exhibit the respective colours.

But, however well supported this doctrine of the formation of colours by density may be, we find the same author (Dr Priestley), whom we have just now seen arguing for it in his history of electricity, arguing against it in his history of vision. "There are (says he) no optical experiments with which Sir Isaac Newton seems to have taken more pains than those relating to the rings of colours which appear in thin plates; and in all his observations and investigations concerning them, he discovers the greatest sagacity both as a philosopher and mathematician; and yet in no object to which he gave his attention, does he seem to have overlooked more important circumstances in the appearances he observed, or to have been more mistaken with regard to their causes. The former will be evident from the observations of those who succeeded him in these inquiries, particularly those of the Abbé Mazeas. This gentleman, endeavouring to give a very high polish to the flat side of an object-glass, happened to be rubbing it against another piece of flat and smooth glass; when he was surprised to find, that after this friction, they adhered very firmly together, till at last he could not move the one above the other. But he was much more surprised to observe the same colours between these plane glasses that Newton observed between the convex object-glass of a telescope and another that is plane. These colours between the plane glasses, the Abbé observes, were in proportion to their adhesion. The resemblance between them and the colours produced by Newton, induced him to give a very particular attention to them; and his observations and experiments are as follows:

¹²
Newtonian theory improved by Dr Priestley.

¹³
Curious experiments by the Abbé Mazeas.

"If the surfaces of the pieces of glass are transparent, and well polished, such as are used for mirrors, and the pressure be as equal as possible on every part of the two surfaces, a resistance, he says, will soon be perceived when one of them is made to slide over the other; sometimes towards the middle, and sometimes towards the edges; but wherever the resistance is felt, two or three very fine curve lines will be perceived, some of a pale red, and others of a faint green. Continuing the friction, these red and green lines increase in number at the place of contact, the colours being sometimes mixed without any order, and sometimes disposed in a regular manner. In the last case, the coloured lines are generally concentric circles, or ellipses, or rather ovals, more or less elongated as the surfaces

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surfaces are more or less united. These figures will not fail to appear, if the glasses are well wiped and warmed before the friction.

“ When the colours are formed, the glasses adhere with considerable force, and would always continue so without any change in the colours. In the centre of all those ovals, the longer diameter of which generally exceeds ten lines, there appears a small plate of the same figure, exactly like a plate of gold interposed between the glasses; and in the centre of it there is often a dark spot, which absorbs all the rays of light except the violet; for this colour appears very vivid through a prism.

“ If the glasses are separated suddenly, either by sliding them horizontally over one another, or by the action of fire, as will be explained hereafter, the colours will appear immediately upon their being put together again, without the least friction.

“ Beginning by the slightest touch, and increasing the pressure by insensible degrees, there first appears an oval plate of a faint red, and in the midst of it a spot of light green, which enlarges by the pressure, and becomes a green oval, with a red spot in the centre; and this, enlarging in its turn, discovers a green spot in its centre. Thus the red and the green succeed one another in turns, assuming different shades, and having other colours mixed with them, which will be distinguished presently.

“ The greatest difference between these colours exhibited between plane surfaces and those formed by curve ones is, that in the former case pressure alone will not produce them, except in the case above mentioned. With whatever force he compressed them, his attempts to produce the colours were in vain without previous friction. But the reason of this plainly was, that with sliding one of the glasses over the other, they could not be brought to approach near enough for the purpose.

“ Having made these observations with plates of glass whose sides were nearly parallel, he got two prisms with very small refracting angles; and rubbing them together, when they were so joined as to form a parallelepiped, the colours appeared with a surprising lustre at the places of contact, owing, he did not doubt, to the separation of the rays of light by the prism. In this case, differently coloured ovals appeared, but the plate of gold in them was much whiter, and only appeared yellow about its edges. The plate having a black spot in its centre, was bordered by a deep purple. He could not perceive any violet by his naked eye, but it might be perceived by the help of a lens with a weak light. It appeared in a very small quantity at the confines of the purple and the blue, and seemed to him to be only a mixture of these two colours. It was very visible in each of the coloured rings by inclining the glasses to the light of the moon. Next to the purple and violet appeared blue, orange, red tinged with purple, light green, and faint purple. The other rings appeared to the naked eye to consist of nothing but faint reds and greens; and they were so shaded that it was not easy to mark their terminations. That the order of these may be compared with Newton's, he gives a view of both in the following table :

<i>Order of the Colours in the Plane Glasses.</i>		<i>Order of the Colours in Newt. Object Glasses.</i>	
Order I.	{	Black spot	Black
		Whitish oval	Blue
		Yellow border	White
		Deep purple	Yellow
Order II.	{	Red	Red
		Blue	Violet
		Orange	Blue
Order III.	{	Purple	Green
		Greenish blue	Yellow
		Yellow green	Red
Order IV.	{	Purple red	Purple
		Blue	Blue
		Green	Green
Order V.	{	Yellow	Yellow
		Red	Red
Order VI.	{	Green	Green
		Red	Red
Order VII.	{	Faint green	Greenish blue
		Faint red	Red
Order VIII.	{	Weak green	Greenish blue
		Light red	Red
Order IX.	{	Very faint green	Greenish blue
		Very faint red.	Red
			Greenish blue
			Pale red.

“ When these coloured glasses were suspended over the flame of a candle, the colours disappeared suddenly, though the glasses still continued to adhere to one another when they were parallel to the horizon. When they were suffered to cool, the colours returned by degrees to their former places, in the order of the preceding table.

“ After this the Abbé took two plates much thicker than the former, in order to observe at his leisure the action of fire upon the matter which he supposed to produce the colours; and observed, that as they grew warm, the colours retired to the edges of the glasses, and there became narrower and narrower till they were reduced to imperceptible lines. Withdrawing the flame, they returned to their place. This experiment he continued till the glasses were bent by the violence of the heat. It was pleasant, he says, to observe these colours glide over the surface of the glass as they were pursued by the flame.

“ At the first our author had no doubt but that these colours were owing to a thin plate of air between the glasses, to which Newton has ascribed them: but the remarkable difference in the circumstances attending those produced by the flat plates, and those produced by the object-glasses of Newton, convinced him that the air was not the cause of this appearance. The colours of the flat plates vanished at the approach of flame, but those of the object-glasses did not. He even heated the latter till that which was next the flame was cracked by the heat, before he could observe the least dilatation of the coloured rings. This difference was not owing to the plane glasses being less compressed than the convex ones; for though the former were compressed ever so much by a pair of forceps, it did not in the least hinder the effect of the flame.

“ Afterwards he put both the plane glasses and the convex ones into the receiver of an air pump, suspending the former by a thread, and keeping the latter compressed

pressed by two strings; but he observed no change in the colours of either of them in the most perfect vacuum he could make.

“ Notwithstanding these experiments seemed to be conclusive against the hypothesis of these colours being formed by a plate of air, the Abbe frankly acknowledges, that the air may adhere so obstinately to the surface of the glasses as not to be separated from them by the force of the pump; which, indeed, is agreeable to other appearances: but the following experiments of our author make it still more improbable that the air should be the cause of these colours.

“ To try the utmost effect of heat upon these coloured plates, after warming them gradually, he laid them upon burning coals; but though they were nearly red, yet when he rubbed them together by means of an iron rod, he observed the same coloured circles and ovals as before. When he ceased to press upon them the colours seemed to vanish; but when he repeated the friction, they returned, and continued till the pieces of glass began to be red-hot, and their surfaces to be united by fusion.

“ When the outward surface of one of his plates of glass was quicksilvered, none of these colours were visible, though the glasses continued to adhere with the same force. This he ascribed to the stronger impression made on the eye by the greater quantity of light reflected from the quicksilver.

“ Judging from the resemblance between his experiments and those of Sir Isaac Newton, that the colours were owing to the thickness of some matter, whatever that was, interposed between the glasses, the Abbe, in order to verify his hypothesis, tried the experiment on thicker substances. He put between his glasses a little ball of suet, about a fourth of a line in diameter, and pressed it between the two surfaces, warming them at the same time, in order to disperse the suet; but though he rubbed them together as before, and used other soft substances besides suet, his endeavours to produce the colours had no effect. But, rubbing them with more violence in a circular manner, he was surpris'd on looking at a candle through them, to see it surrounded with two or three concentric rings, very broad, and with very lively delicate colours; namely, a red inclining to a yellow, and a green inclining to that of an emerald. At that time he observed only these two colours; but continuing the friction, the rings assumed the colours of blue, yellow, and violet, especially when he looked through the glasses on bodies directly opposed to the sun. If, after having rubbed the glasses, the thickness was considerably diminished, the colours grew weaker by transmitted light, but they seemed to be much stronger by reflection, and to gain on one side what they lost on the other.

“ Our author was confirmed in his opinion, that there must be some error in Newton's hypothesis, by considering, that, according to his measures, the colours of the plates varied with the difference of a millionth part of an inch; whereas he was satisfied that there must have been much greater differences in the distance between his glasses, when the colours remained unchanged.

“ If the colour depended upon the thickness only, he

thought that the matter interposed between the glasses ought to have given the same colour when it was reduced to a thin plate by simple fusion as well as by friction, and that, in rubbing two plates together, warming them at different times, and compressing them with a considerable force, other colours would have appeared besides those above-mentioned.

“ These circumstances made him suspect, that the different thicknesses of the substance interposed between the glasses served only to make them more or less transparent; which was an essential condition in the experiment; and he imagined that the friction diffused over the surface of the thin substance a kind of matter on which the colours are formed by reflected light: for when he held the plates (which gave the colours when the suet was between them) over the flame of a small candle, the colours fled with great precipitation, and returned to their place without his being able to perceive the least alteration in the suet.

“ He was confirmed in his conjectures, by frequently observing, that when the glasses were separated, at the moment the colours disappeared, they were covered with the same greasy matter, and that it seemed to be in the very same state as when they were separated without warming. Besides, having often repeated the same experiment with different kinds of matter, he found that the degree of heat that dispersed the colours was not always sufficient to melt it; which difference was more sensible in proportion as the matter interposed was made thinner.

“ Instead of the suet, he sometimes made use of Spanish wax, resin, common wax, and the sediment of urine. He began with Spanish wax, on account of its remarkable transparency in Mr Hauksbee's electrical experiments; but he had much difficulty in making it sufficiently thin by friction, being often obliged to warm his glasses, to seize the moment of fusion, which continued but a short time, and to hazard the burning of his fingers.

“ The experiment at length succeeding, the Spanish wax appeared with its opacity and natural colour when it reflected the light, but they both disappeared in the transmitted light. He observed the same rings in it as in the suet; and indeed he could perceive but little difference between the colour of suet, Spanish wax, common wax, or resin; except that this last substance did not make the colours so vivid, on account of the too great transparency of its particles.

“ The sediment of urine had something more particular in its appearance, as its colours were more lively. Holding it above the flame, its colour disappeared; and keeping it in that situation, there were formed, upon its surface, ramifications, like those of the hoar-frost, which disappeared as the glasses grew cold. There were the same ramifications both upon the suet and the wax, but they were not so considerable. The glasses which had Spanish wax and resin between them adhered with so much force, that they could not be separated without the help of fire; and when they began to grow warm, they separated with a noise like that of a glass breaking in the fire, though the glasses were not broken, and the matter between them was not melted.

“ Separating the glasses which he first used very suddenly,

14
Newtonian
hypothesis
opposed.

suddenly, he observed upon their surface very thin vapours, which formed different colours, but presently vanished altogether.

“ To try the effect of vapour, he breathed upon one of his plates of glass, and observed that the vapours which adhered to the glasses sometimes formed, before they were entirely dispersed, a surprising variety of colours. This experiment, he observes, does not always succeed at the first trial. The glass must be breathed upon several times, and care must be taken to wipe it every time with one's hand, both to take off the moisture, and also to make upon the glass a kind of furrows, which contribute very much to the variety of colours, by making inequalities in the thicknesses of the vapours. It is necessary, also, that the glasses on which these experiments are made have no quicksilver upon them.

“ When the particles of water which formed this vapour were too thick to exhibit these colours, he struck them several times with his pencil, in order to attenuate them; and then he saw an infinity of small coloured threads which succeeded one another with great rapidity.

“ Putting a drop of water between two pieces of common glass, he observed that the compression of them produced no colour; but if, while they were compressed, the water was made to pass from one place to another, it left behind it large spots, red, yellow, green, purple, &c. and the spots assumed different colours with a surprising rapidity, and presented to the eye a most beautiful variety of shades.

“ In order to determine with greater certainty whether they were vapours that caused the colours in his first observations, he first breathed upon one of his plates of glass, and then rubbed them against one another, when the colours appeared in the same order as before, but darker, and dispersed in confusion in the places occupied by the vapours: but when he made use of fire to dissipate the watery particles, the colours resumed their lustre.

“ Newton, having introduced a drop of water between his two object-glasses, observed, that in proportion as the water insinuated itself between the glasses, the colours grew fainter, and the rings were contracted; and ascribing these colours to the thickness of the plate of water, as he ascribed the former to that of the plate of air, he measured the diameters of the coloured rings made by the plate of water, and concluded that the intervals between the glasses at the similar rings of these two mediums were nearly as three to four; and thence he inferred, that in all cases, these intervals would be as the sines of the refractions of these mediums.

“ The Abbé Mazeas, in order to assure himself whether, agreeable to this rule, the coloured rings of his glasses depended upon the thickness of the water only, dipped one of the edges of his coloured glasses in a vessel of water, having taken care to wipe and warm them well, before he produced his colours by friction. The water was a considerable time in rising as high as the glasses; and in proportion as it ascended, he perceived a very thin plate of water, which seemed to pass over the matter which he thought produced the colours, without mixing with it; for beyond this plate of water, he still perceived the co-

lours in the same place and order, but deeper and darker; and holding the glasses above the flame of a candle, he saw the colours go and come several times as he moved them nearer to or farther from the flame. He then moistened both the glasses more than before; and rubbing them as usual, he always saw the same appearance; and seizing the moment when the colours had disappeared to separate the glasses, he always found that they were wet. On this account, he thought that it could not be the water on which the colour depended, but some substance much more sensible to heat. He also thought that these coloured rings could not be owing to the compression of the glasses; or that, if this circumstance did contribute any thing to them, it served rather to modify than to generate them.

“ M. du Tour gave particular attention to the preceding observations of the Abbé Mazeas. He repeated the experiments with some variation of circumstances, particularly comparing them with those of Sir Isaac Newton. He is so far from supposing a plate of air to be necessary to the formation of these coloured rings, that he thinks the reason of their not appearing between the flat plates of glass is the adhering of the air to their surfaces; and that mere pressure is not sufficient to expel it; except, as the Abbé Mazeas observed, the rings had before been made in the same place; in which case, simple apposition without friction is sufficient; the air, probably, not having had time to apply itself so closely to the surface of the glass. The contact of some other substances, M. du Tour observes, is not so prejudicial in this experiment as that of air; for he found, that, if he only gave the plates a slight coating of any kind of grease, the rings would appear without friction. Also dipping them slightly in water, or wiping them with his finger, would answer the same purpose. He verified his conjectures by means of the air-pump: for, dipping two pieces of glass in water, one of which had been wiped, and the other not, the former appeared to have no bubbles adhering to it when the air was exhausted, whereas the other had.

“ When one of the glasses is convex, our author observes, that the particles of air may more easily make their escape by pressure only; whereas their retreat is in a manner cut off when they are compressed between two flat surfaces. The air-pump, he found, was not able to detach these particles of air from the surfaces to which they adhere; leaving these flat plates for a considerable time in an exhausted receiver, was not sufficient to prepare them so well for the experiment as wiping them.

“ Besides the observations on the colours of thin plates, it has been seen that Sir Isaac Newton imagined he could account for the colours exhibited by thick ones in some cases in a similar manner; particularly in those curious experiments in which he admitted a beam of light through a hole in a piece of pasteboard, and observed the rings of colours reflected back upon it by a concave glass mirror of equal thickness in all places. These experiments were resumed, and happily pursued by the Duke de Chaulnes, who ascribed these colours to the inflection of light*. Chance led the duke to observe, that when the nearer surface of the glass mirror was clouded by breathing upon it,

15
Tour's observations.

16
Experiments on colours by reflection.

* See Optics.

so

so as lightly to tarnish it, a white diffused and vivid light was seen upon the pasteboard, and all the colours of the rings became much stronger, and more distinct. This appearance he made constant by moistening the surface of the mirror with a little milk and water, and suffering it to dry upon it.

"In all his experiments upon this subject, he found, that when the rays fell converging on the surface of the mirror, the rings were hardly visible; when they fell parallel upon it, as they must have done in all the experiments of Newton, they appeared sufficiently distinct; but when, by means of a convex lens placed in the hole of the window, they were made to diverge from the centre of the sphere to which the mirror was ground, so that they fell perpendicularly on the surface of the mirror, the colours were as vivid as he could make them. In this case he could remove the reflected image to a great distance from the hole, without making the rings disappear; and he could plainly perceive them to arise from their central spots, which changed their colours several times.

"The effect of tarnishing the mirror convinced him, that these coloured rings depended on the first surface of the mirror; and that the second surface, or that which reflected them after they had passed the first, only served to collect them and throw them upon the pasteboard in a quantity sufficient to make them visible; and he was confirmed in his supposition by the following experiments.

"He took a plano-convex object-glass, of six feet focus, and placed it six feet from the pasteboard with its convex side towards it. By this means the rays which fell upon that surface, after being refracted there, were transmitted through the thickness of the glass, parallel to one another, and fell perpendicularly on the plane surface that reflected them, and, in their return, would be collected upon the pasteboard. In these circumstances the rings appeared very distinct after he had tarnished the convex surface, which in this position was next to the light.

"Turning the same glass the contrary way, so that the plane surface was towards the pasteboard, he could perceive none of the rings at the distance of six feet; but they were visible at the distance of three feet; because at that distance the second surface reflected the rays by its concavity directly towards the pasteboard.

"These two experiments demonstrate the use of the second surface of the mirror, and show the manner of placing it to most advantage. Those that follow show the use of the first surface with respect to these rings; and he was led to make them by the casual observation above mentioned.

"Newton, he observes, had remarked, that when he made use of a mirror of the same focus with the first he had used, but of twice the thickness, he found the diameter of the rings much smaller than before. This observation the duke thought favourable to his own conclusions; for if these rings depend upon the first surface, the nearer it is to the second, which only reflects the ray transmitted from it, the larger they ought to appear upon the pasteboard.

"To ascertain this fact, he thought of making use of two moveable surfaces; and to make use of a micrometer to measure the distance between them with

exactness. For this purpose he took a metallic mirror belonging to a reflecting telescope, being part of a sphere of ten feet radius; and he fixed it firm upon a foot in which was a groove that carried a light frame, to which was fastened a thin piece of talk tarnished with milk and water. The frame that supported the piece of talk could either be brought into contact with the mirror, or be removed to the distance of eight or nine inches from it, and the micrometer showed to the utmost exactness the least motion of the frame.

"Having placed this mirror ten feet from the pasteboard, that is, at the distance of the radius of its own sphere, he observed the rings to appear very distinct; the form of his mirror being very true: but the diameter of the rings upon the pasteboard varied with the distance of the talk from the mirror: so that they were very large when the talk was near the mirror, and very small when it was placed at the distance of seven or eight inches.

"These experiments proved, that the rings were formed by the first surface, and reflected by the second; but it still remained to be determined in what manner they were formed. He imagined that the small pencils of rays that were transmitted through the pores of the glass, or any other transparent substance, might suffer a kind of inflection, which might change the cylinder which they formed into a truncated cone, either by means of their different degrees of inflexibility, or by the different distances at which they pass by the edges of the small hole through which they are transmitted. Pursuing this idea, he thought of making use of some body, the pores of which were of a known and determined shape. Instead, therefore, of the piece of talk, he placed a piece of fine linen in the above-mentioned frame, stretching it as even as possible, to make the pores formed by the threads more exact, and more permeable by the light; and he soon found, with great pleasure, that his conjecture was verified: for instead of the circular rings which he had before, they were now manifestly square, though their angles were a little rounded; and they were coloured as the others, though the light was not very vivid, on account of the quantity that was stopped by the muslin.

"When, instead of the muslin, he stretched across his frame fine silver wires exactly parallel, at the distance of about three quarters of a line, or a whole line from one another, without any other wires across them; instead of the rings which he had seen before, there was nothing upon the pasteboard but a gleam of white light divided by many small streaks, coloured in a very vivid manner, and in the same manner as the rings."

Thus we have another hypothesis of the formation of colours, namely, by the inflection of light in its passage out from between the solid and impenetrable particles of which bodies are composed. It is, however, very difficult, upon the hypothesis either of Sir Isaac Newton, or that of the duke de Chaulnes, to give a reason why bodies that are not entirely white, should not appear variously coloured. For it appears from Sir Isaac Newton's experiments, that plates of different density are capable of exhibiting the same colours; and that where a plate is continually varying in density, it will produce all the colours. Now it is

17
Another theory of colours.

evident, that the plates of which we suppose all natural bodies to be composed, must be similar to one that is perpetually varying in its thickness; for supposing the plates of which any substance is composed to be of any determinate thickness, 9 millionth parts of an inch for instance; such of the rays as are reflected from this plate will be red. But if any of them penetrate to the depth of $11\frac{1}{8}$ of these parts, they will be reflected of a violet colour, &c. and thus must alloy and obscure the red; and so of others. If we suppose the colours to be produced by inflection, it will be equally difficult to account for some particular rays being inflected and others not; seeing we observe that all of them are capable of being inflected by every substance whatever, when they pass very near it. In some cases, too, colours are produced when the light is neither refracted nor inflected, as far as we can judge; and this seems to obscure the theory of chromatics more than any thing we have yet mentioned.

As the experiments we are now about to mention are of the greatest importance, and in direct terms contradict one of Sir Isaac Newton's, we shall give a full account of them, from Priestley's History of Vision, &c. with his remarks thereon.

18
One of Sir Isaac Newton's experiments found to be erroneous.

The experiment in question is the eighth of Newton's second book of Optics: "He (Sir Isaac Newton) found, he says, that when light goes out of air through several contiguous refracting mediums, as through water and glass, and thence goes out again into air, whether the refracting surfaces be parallel or inclined to one another, that light, as often as, by contrary refractions, it is so corrected, that it emerges in lines parallel to those in which it was incident, continues ever after to be white; but if the emergent rays be inclined to the incident, the whiteness of the emerging light will, by degrees, in passing on from the place of emergence, become tinged at its edges with colours. This he tried by refracting light with prisms of glass, placed within a prismatic vessel of water.

"By theorems, deduced from this experiment, he infers, that the refraction of the rays of every sort, made out of any medium into air, are known by having the refraction of the rays of any one sort; and also, that the refraction out of one medium into another is found as often as we have the refractions out of them both into any third medium.

"On the contrary, a Swedish philosopher (M. Klingensfierna) observes*, that in this experiment, the rays of light, after passing through the water and the glass, though they come out parallel to the incident rays, will be coloured; but that the smaller the glass prism is, the nearer will the result of it approach to Newton's description.

"This paper of M. Klingensfierna, being communicated to Mr Dollond by M. Mallet, made him entertain doubts concerning Newton's report of the result of his experiment, and determined him to have recourse to experiments of his own.

"He therefore cemented together two plates of parallel glass, at their edges, so as to form a prismatic vessel when stopped at the ends or bases; and the edge being turned downwards, he placed in it a glass prism with one of its edges upwards, and filled up the va-

cancy with clear water; so that the refraction of the prism was contrived to be contrary to that of the water, in order that a ray of light, transmitted through both these refracting mediums, might be affected by the difference only between the two refractions. As he found the water to refract more or less than the glass prism, he diminished or increased the angle between the glass plates, till he found the two contrary refractions to be equal, which he discovered by viewing an object through this double prism. For when it appeared neither raised nor depressed, he was satisfied that the refractions were equal, and that the emergent rays were parallel to the incident.

"Now, according to the prevailing opinion, he observes, that the object should have appeared through this double prism in its natural colour; for if the difference of refrangibility had been in all respects equal, in the two equal refractions, they would have rectified each other. But this experiment fully proved the fallacy of the received opinion, by showing the divergency of the light by the glass prism to be almost double of that by the water; for the image of the object, though not at all refracted, was yet as much inflected with prismatic colours as though it had been seen through a glass wedge only whose angle was near 30 degrees.

19
Colours produced without refraction or reflection.

"This experiment is the very same with that of Sir Isaac Newton above mentioned, notwithstanding the result was so remarkably different: but Mr Dollond assures us, that he used all possible precaution and care in his process; and he kept his apparatus by him, that he might evince the truth of what he wrote, whenever he should be properly required to do it.

"He plainly saw, however, that if the refracting angle of the water-vessel could have admitted of a sufficient increase, the divergency of the coloured rays would have been greatly diminished, or entirely rectified; and that there would have been a very great refraction without colour, as he had already produced a great discolouring without refraction; but the incon- veniency of so large an angle as that of the prismatic vessel must have been, to bring the light to an equal divergency with that of the glass prism, whose angle was about 60° , made it necessary to try some experiments of the same kind with smaller angles.

"Accordingly he got a wedge of plate-glass, the angle of which was only nine degrees; and, using it in the same circumstances, he increased the angle of the water-wedge, in which it was placed, till the divergency of the light by the water was equal to that by the glass; that is, till the image of the object, though considerably refracted by the excess of the refraction of the water, appeared nevertheless quite free from any colours proceeding from the different refrangibility of the light.

"Notwithstanding it evidently appeared, I may say²⁰ to almost all philosophers, that Mr Dollond had made Sir Isaac's Defences of a real discovery of something not comprehended in the optical principles of Sir Isaac Newton, it did not appear to so sensible a man, and so good a mathematician, as Mr Murdoch is universally acknowledged to be. Upon this occasion he interposed in the defence, as he imagined, of Sir Isaac Newton; maintaining, that Mr Dollond's positions, which he says, he knows not by what mishap have been deemed paradoxes in Sir

* Swed. Abhand. vol. xvi. p. 300.

²⁰ Defences of Sir Isaac.

Sir Isaac's theory of light, are really the necessary consequences of it. He also endeavours to show, that Sir Isaac might not be mistaken in his account of the experiment above mentioned. But admitting all that he advances in this part of his defence, Newton must have made use of a prism with a much smaller refracting angle than, from his own account of his experiments, we have any reason to believe he ever did make use of.

"The fact probably was, that Sir Isaac deceived himself in this case, by attending to what he imagined to be the clear consequences of his other experiments; and though the light he saw was certainly tinged with colours, and he must have seen it to be so, yet he might imagine that this circumstance arose from some imperfection in his prisms, or in the disposition of them, which he did not think it worth his while to examine. It is also observable, that Sir Isaac is not so particular in his description of his prisms, and other parts of his apparatus, in his account of this experiment, as he generally is in other cases, and therefore probably wrote his account of it from his memory only.

P. 804.

"Much has been said on this experiment; and it is thought very extraordinary, that a man of Sir Isaac's accurate attention should have overlooked a circumstance, the effect of which now appears to be so considerable. But it has happily occurred to Mr Mitchel, that, as Sir Isaac Newton observes, he used to put saccharum saturni into his water to increase its refractive power, the lead, even in this form, might increase the dissipative refraction, as it does in the composition of glasses; and if so, that this would account for Newton's not finding his dissipative power of water less than that of the glass prisms, which he otherwise ought to have done, if he had tried the experiment as he said he did.

"Accordingly he included a prism of glass in water, as highly impregnated with saccharum saturni as it would bear, the proportion of saccharum to water being about as 5 to 11. When the image, seen through the water (so impregnated) and a glass prism, was in its natural place, it still was coloured, though very little: he thought not more than a fourth part as much as when seen through plain water, and the prism in its natural place; so that he had no doubt, but that, if his prism had had a little less of the dispersing power, its errors would have been perfectly corrected."

21
Mr Delaval's experiments on the colours of opaque bodies.

Besides the experiments of Mr Delaval above related; and which were made on the colours of transparent bodies, he has lately published an account of some made upon the permanent colours of opaque substances; the discovery of which must be of the utmost consequence in the arts of colour-making and dyeing. These arts, he observes, were in very remote ages carried to the utmost height of perfection in the countries of Phœnicia, Egypt, Palestine, India, &c. and that the inhabitants of these countries also excelled in the art of imitating gems, and tinging glass and enamel of various colours. The colours used in very ancient paintings were as various as those now in

use, and greatly superior both in beauty and durability. The paints used by Apelles were so bright, that he was obliged to glaze his pictures with a dark coloured varnish, lest the eye should be offended by their excessive brightness; and even these were inferior to what had been used among the ancient Egyptians. Pliny complains that the art of painting was greatly decayed in his time; and the moderns were not furnished with any means of retrieving the art, until they began to avail themselves of experimental observations.

The changes of colour in permanently coloured bodies, our author observes, are produced by the same laws which take place in transparent colourless substances; and the experiments by which they can be investigated consist chiefly of various methods of uniting the colouring particles into larger, or dividing them into smaller masses. Sir Isaac Newton made his experiments chiefly on transparent substances; and in the few places where he treats of others, acknowledges his deficiency of experiments. He makes the following remark, however, on those bodies which reflect one kind of light and transmit another, viz. that "If these glasses or liquors were so thick and massy that no light could get through them, he questioned whether they would not, like other opaque bodies, appear of one and the same colour in all positions of the eye: though he could not yet affirm it from experience." It was the opinion of this great philosopher, that all coloured matter reflects the rays of light, some reflecting the more refrangible, and others the less refrangible rays more copiously; and that this is not only a true reason of these colours, but likewise the only reason. He was likewise of opinion, that opaque bodies reflect the light from their interior surface by some power of the body evenly diffused over and external to it. With regard to transparent-coloured liquors, he expresses himself in the following manner: "A transparent body, which looks of any colour by transmitted light, may also look of the same colour by reflected light; the light of that colour being reflected by the farther surface of that body, or by the air beyond it: and then the reflected colour will be diminished, and perhaps cease, by making the body very thick, and pitching it on the back side to diminish the reflection of its farther surface, so that the light reflected from the tinging particles may predominate. In such cases, the colour of the reflected light will be apt to vary from that of the light transmitted."

22
These colours depend chiefly on the division of the colouring particles.

To investigate the truth of these opinions, Mr Delaval entered upon a course of experiments with transparent coloured liquors and glasses, as well as with opaque and semi-transparent bodies. From these he discovered several remarkable properties of the colouring matter; particularly, that in transparent coloured substances it does not reflect any light; and when, by intercepting the light which was transmitted, it is hindered from passing through such substances, they do not vary from their former colour to any other, but become entirely black (A).

This incapacity of the colouring particles of transparent

L 2

(A) Here our author observes, that he makes use of the word *colour* only to express those called *primary*; such

²³
No light
reflected
by the co-
louring
particles.

parent bodies to reflect light, being deduced from very numerous experiments, may therefore be held as a general law. It will appear the more extensive, if we consider, that, for the most part, the tinging particles of liquors or other transparent substances are extracted from opaque bodies; that the opaque bodies owe their colours to those particles, in like manner as the transparent substances do; and that by the loss of them they are deprived of their colours.

²⁴
Apparatus
for making
these expe-
riments.

For making his experiments, Mr Delaval used small phials of flint-glass, whose form was a parallelopiped, and their height, exclusive of the neck, about two inches, the base about an inch square, and the neck two inches in length. The bottom and three sides of each of these phials were covered with a black varnish; the cylindrical neck, and the anterior side, except at its edges, being left uncovered. He was careful to avoid any crevices in the varnish, that no light might be admitted except through the neck or anterior side of the phials.

In these experiments it is of importance to have the phials perfectly clean; and as many of the liquors are apt to deposit a sediment, they ought to be put into the phials only at the time the experiments are to be made. The uncovered side of the phials should not be placed opposite to the window through which the light is admitted; because in that situation the light would be reflected from the farther side of the phial; and our author observes, that smooth black substances reflect light very powerfully. But as it is a principal object in the experiment, that no light be transmitted through the liquor, this is best accomplished by placing the uncovered side of the phial in such a situation that it may form a right angle with the window.

²⁵
The colour-
ing matter
only shows
itself by
transmitted
light.

With these precautions, our author viewed a great number of solutions, both of coloured metallic salts and of the tinging matter of vegetables; universally observing, that the colour by reflection was black, whatever it might be when viewed by transmitted light. If these liquors, however, are spread thin upon any white ground, they appear of the same colour as when viewed by transmitted light; but on a black ground they afford no colour, unless the black body be polished; in which case the reflection of the light through it produces the same effect as transmission.

The experiments with tinged glasses were in many respects analogous to those with transparent-coloured liquors. For these he made several parcels of coloured glasses, principally using one composed of equal parts of borax and white sand. The glass was reduced to powder, and afterwards ground, together with the ingredients by which the colours were imparted. "This method (says he) of incorporating the tinging particles is greatly preferable to mixing them with the raw materials; and the glasses thus composed excel most others in hardness, being scarcely inferior in lustre to real gems."

The result of all the experiments made in this manner was, that when matter is of such thinness, and the tinge so diluted that light can be transmitted through

it, the glasses then appear vividly coloured; but when they are in larger masses, and the tinging matter is more densely diffused through them, they appear black; for these, as well as the transparent-coloured liquors, show their colour only by transmission. The following experiments were made with a view to determine the proportion of tinging matter which produces colour or blackness.

1. Glass was tinged green by adding to it $\frac{1}{100}$ th of its weight of copper; and that whether the latter was used in its metallic or calcined state. ²⁶ Experiments to determine the proportion of tinging matter.

2. A blue glass was made by the addition of zaffre, a purple one by manganese, a red glass by gold, and yellow glasses by silver and calcined iron. A yellow glass resembling a topaz was likewise made by the addition of a small quantity of charcoal in powder. The same colour was likewise procured by the addition of wheat-flour, rosin, and several other inflammable matters. Small pieces of each of these glasses being ground by a lapidary, resembled gems of their different colours.

3. Having formed pieces of such glasses about two inches thick, he inclosed them in black cloth on all sides, except their farther and anterior surfaces. In this situation each of them showed a vivid colour when light was transmitted through them; but when the posterior surface was likewise covered with the cloth to prevent this transmission, no other colour than black was exhibited by any of them.

4. When plates of transparent-coloured glass, somewhat thicker than common window-glass, were made use of, they always exhibited their colours by transmitted light.

5. On intercepting the light transmitted through these coloured plates, they as constantly appeared black when placed in such a direction as to form a right angle with the window.

From these phenomena Mr Delaval deduced the following observations: 1. That the colouring particles do not reflect any light. 2. That a medium, such as Sir Isaac Newton has described, is diffused over both the anterior and farther surfaces of the plates, whereby objects are equally and regularly reflected as by a mirror. Hence, when it is said that light is reflected by the surface of any substance, it should be understood from this expression, that the reflection is effected by the medium diffused over its surface.

6. When a lighted candle is placed near one of those coloured plates, the flame is reflected by the medium which is diffused over the anterior surface. The image thus reflected entirely resembles the flame in size and colour; being scarcely diminished, and not in the least tinged by the coloured glass. ²⁷ On the reflection of the light of a candle by coloured glasses.

7. If the plate be not so intensely coloured, or so massy, as to hinder the transmission of the light of the candle, there appears a secondary image of the flame, which is reflected by the medium contiguous to the farther surface of the glass; and as the light thus reflected passes through the coloured glass, it is tinged very vividly.

8. When

such a mixture of them as does not compose whiteness, or any of the gradations between white and black; such as are called by Sir Isaac Newton, gray, dun, or russet brown.

8. When the glass used in this experiment is of a green colour, the image of the flame is always of a bright green; and when glasses of other colours are used, that of the secondary flame is always the same with that of the glass.

9. The secondary image is less than that reflected from the anterior surface. This diminution is occasioned by the loss of that part of the light which is absorbed in passing through the coloured glass. For whenever any medium transmits one sort of rays more copiously than the rest, it stops a great part of the differently coloured rays. Much more light also is lost in passing through coloured than transparent substances. In making these observations, it is proper to choose coloured plates of glass which are not in every part of an equal thickness, that the secondary image may not coincide with that reflected from the anterior surface, and be intercepted by it.

10. When the plates are so thick, and so copiously coloured, that the light cannot penetrate to their farther surface, they appear intensely black in whatever direction they are viewed, and afford no secondary image, but only reflect, from their anterior surface, the flame, or any other objects that are opposed to them. These objects are represented in their own proper colours, and are as free from tinge as those reflected from quicksilvered glass, or specula made of white metals.

Hence again it is manifest, that the colouring particles do not possess any share of reflective power; for if they had any share in this reflection, they would certainly impart some share of colour to the light they reflected. Hence also it appears, that transparent coloured bodies, in a solid state, possess no more reflective power than those in a fluid state.

Our author next considers the colouring particles themselves, pure, and unmixed with other media. In order to procure masses made up of such particles, several transparent coloured liquors were reduced to a solid consistence by evaporation. By employing a gentle heat, the colouring matter may thus remain unpaired; and is capable of having its particles again separated by water or other liquids, and tinging them as before.

In this state the colouring particles reflect no light, and therefore appear uniformly black, whatever substance they have been extracted from. In the course of his experiments, Mr Delaval made use of the infusions of brazil wood, logwood, fustic, turmeric, red saunders, alkanet, sap-green, kermes, and all the other transparent coloured liquors he had tried before, among which were infusions of red and yellow flowers, without observing the least variation in the result.

Some liquors are apt to become totally opaque by evaporation; the reason of which may be the crystallization of saline matters, or the coalescence of the particles into masses, differing considerably in density from the menstrua in which they were dissolved. When this opacity takes place, our author has constantly observed, that they became incapable of entering the pores of wool, silk, or other matters of that kind, or of adhering to their surface; and consequently unfit for the purposes of dyeing. This he supposes to arise from their increased bulk; for the attractive force by which the particles cohere together is weakened in pro-

portion as their bulk increases; so that the degree of magnitude of the colouring particles, which is essential to the opacity of liquors, is inconsistent with the minuteness requisite for dyeing. An instance of this is given in an infusion of fustic. Having infused some of this wood in such a quantity of water, that the latter was saturated with the colouring particles, he evaporated the liquor to a solid consistence with an uninterrupted, but very gentle heat. During every part of the process the liquor continued transparent, and the solid extract yielded by it transmitted a yellow colour when spread thin, but appeared black when thicker masses were viewed. Having prepared another pint of this liquor, he evaporated half the water, and allowed the remainder to become cold. In this state it became turbid and opaque; on filtering, a transparent tincture passed through, an opaque fecula remaining on the paper. This fecula did not adhere to the paper, but was easily separable from it: on being dried, it appeared white with a slight tinge of yellow; but was nevertheless soluble in water, and by solution gave a liquid in all respects similar to the original infusion. "From these circumstances (says he) it appears that a given proportion of water, or a sufficient degree of heat, is requisite to the solution of the colouring particles of fustic. And experience evinces, that those particles which are too gross to pass through filtering paper, are incapable of entering the pores, or firmly cohering to the surface of bodies. Many ingredients, such as the colouring particles of logwood, kermes, and various other matters, are soluble in water in every proportion; and therefore their infusions are not subject to become opaque or turbid during their evaporation. The solid extracts obtained by evaporation reflect no colour, but are black.

Our author also formed solid masses by mixing a small quantity of drying oil with pigments which consist chiefly of colouring matter; as Prussian blue, indigo, and sap-green. These paints likewise exhibit their respective colours only by transmitted light, appearing entirely black when viewed by reflection. Instances of blackness arising from this density of the colouring matter, may be observed in several kinds of fruits, as black currants, cherries, &c. for the juices of these appear red when spread thin on a white ground, or otherwise viewed by transmitted light.

Mr Delaval's next attempt was to consider the action and properties of the colouring particles of opaque bodies themselves, and the means by which these colours are produced. Here our author endeavours to prove, that these colours of opaque bodies appear on the same principles as those already mentioned, which seem black when very dense, but show their proper tinge when spread thin upon a white ground. On this subject the following experiments were made:

1. Grass, and other green leaves of plants, were digested in rectified spirit of wine; by which means a transparent green tincture was obtained. One of the vials formerly mentioned being filled with this liquid, it was observed to transmit a vivid green colour; but the other part of the tincture, which was contiguous to the uncovered side of the vial, reflected no light, and therefore appeared black.

2. Having poured some of the tincture into a China cup, the bottom was thereby made to look green, exactly

28
Experiments on the pure colouring particles.

actly resembling the colour which had been extracted from the leaves.

3. After the colour had been totally abstracted by the vinous spirit, the leaves remained apparently unaltered, either as to figure or texture; but were entirely white, or had their whiteness slightly tinged with brown.

4. Red, purple, and blue flowers, were also digested in spirit of wine, all of which yielded their colouring matter to the spirit, and became white by being deprived of it. From most of these flowers, however, the spirit acquired either no tinge at all, or only a very faint one; but when acidulated, it became red, and by the addition of an alkali appeared blue, purple, or green, according to the quantity of alkali, and the nature of the infusion. In these states, all of them, when viewed by transmitted light, or poured upon a white ground, showed their colours, but universally appeared black by reflection.

5. Red, purple, and blue flowers, were digested in water slightly acidulated with nitrous acid. Thus, red infusions were obtained, which, by saturation with sea-salt, might be preserved for many years.

6. The same liquors were changed green, blue, or purple, by the addition of an alkali; but here the case was the same as before; all of them yielding vivid colours by transmission, but none by reflection. In making this experiment, care must be taken to add the alkali very gradually; for if too much is put in at once to the red liquor, the immediate colours between the red and the green will be wanting. To half an ounce of the red infusion it is proper to add, at once, only the smallest quantity that can be taken upon the point of a pen; repeating this addition slowly, until each of the colours be produced.

7. The flowers, after having been repeatedly macerated in acidulated water, lost their colouring matter, and became white.

8. Yellow flowers also communicated their colours to water and to spirit of wine. The infusions and tinctures of these flowers were subjected to the same experiments as had been employed in the examination of the liquors already mentioned; and appeared yellow by transmitted light, but did not reflect any colour.

9. White paper, linen, &c. may be tinged of any of these colours, by dipping them in the infusions; and the consideration of the manner in which the colours are imparted to the linen, affords much insight into the manner in which natural colours are produced. It has already been observed, that, when the colouring matter of plants is extracted from them, the solid fibrous parts, thus divested of their covering, display their natural whiteness. White linen, paper, &c. are formed of such fibrous vegetable matter; which is bleached by dissolving and detaching the heterogeneous colouring particles. When these are dyed or painted with vegetable colours, it is evident that they do not differ in their manner of acting on the rays of light from natural vegetable bodies; both yielding their colours by transmitting, through the transparent coloured matter, the light which is reflected from the white ground. This white matter frequently exists, without any considerable mixture, in plants, while they are in a state of vegetation; as cot-

ton, white flowers, the pith, wood, seeds, roots, and other parts of several kinds of vegetables. When decayed trees, &c. have been long exposed to the atmosphere, their coloured juices are sometimes so perfectly extracted, that the fibres appear white. This white matter is not distinct from the vegetable earth to which plants are reduced by burning. Mr Delaval has rendered ashes intensely white, by carefully calcining them, and afterwards grinding with a small proportion of nitre, and exposing them to such a degree of heat as would cause the nitre to deflagrate with the remaining quantity of phlogiston. Lastly, the ashes were digested with muriatic acid, in order to dissolve the ferruginous matter diffused through them, and repeatedly washing the remainder in water. Mixing ashes thus purified with borax, and applying a vitrifying heat, an opaque enamel is obtained, remarkable for its whiteness.

Hence it appears, that the earth which forms the substance of plants is white, and separable from that substance which gives to earth its peculiar colour; that whenever it is pure and unmixed, or diffused through colourless media, it shows its native whiteness; and is the only vegetable matter endowed with a reflective power. It may be discovered, however, by other means than that of burning: thus, roses may be whitened by exposing them to the vapour of burning sulphur; an effect which cannot be attributed to the sulphuric acid, but to the phlogiston contained in that vapour. This was proved to be the case, by exposing several kinds of red and purple flowers to the phlogistic vapour issuing from *hepar sulphuris*; and by this every one of them was whitened; their colour being afterwards restored by the addition of an acid either mineral or vegetable.

“ Thus (says Mr Delaval) it appears, that the colouring matter of the flowers is not discharged or removed, but only dissolved by carbonic acid; and thereby divided into particles too minute to exhibit any colour. In this state, together with the vegetable juice in which they are diffused, they form a colourless transparent covering, through which the white matter of the flowers is seen untinged. The colouring particles of plants consist principally of inflammable matter, and their solubility in carbonic acid, and union with it, are analogous to the action of other inflammable bodies upon each other. Thus, æther dissolves all essential and expressed oils, animal empyreumatic oils, and resins. Sulphur, camphor, and almost all substances abounding in phlogiston, are soluble in oils, ardent spirits, or other inflammable menstrua. The manner in which the red colour of vegetable flowers is restored, appears to be explicable from known chemical laws. When acids are applied to the whitened flowers, they unite with the phlogiston which the sulphur had communicated, and disengage it from the colouring particles; which, being thus extricated, resume their original magnitude and hue. A change of the same kind is also produced by fixed alkali, which, like the acids, has a strong attraction for phlogiston, always changes the whitened flowers to a blue, purple, or green colour.

“ In like manner, the action of the rays of light operates upon coloured bodies. Thus, dyed silk, or other substances of that kind, when exposed to the sun's

29
How ashes may be made intensely white.

30
White earth of plants, the only substance in them that reflects the light.

31
Colouring matter dissolved by carbonic acid.

32
Colours destroyed by the light of the sun.

sun's light, are deprived of their colour in every part on which the rays are allowed to act; whilst those preserve their colour which are defended from the light by the folds of the cloth, or intervention of any opaque body. The colours thus impaired, may be restored, if acids are applied while the injury is recent; but they are afterwards apt to fly off, on account of that volatility which is constantly imparted by inflammable matter to any other with which it is united."

Our author now proceeds, at considerable length, to prove the identity of the solar light and carbonic acid; but as recent experiments have shown that these two are essentially distinct, we omit his argumentation upon this head. The error of his theory in this respect, however, does not in the least affect the doctrine concerning colours above laid down: on the contrary, the latest experiments have determined, that carbonic acid in its grossest form, viz. that of common charcoal, manifests a surprising power of whitening various substances; which, according to Mr Delaval's theory, proceeds from the power it has of dissolving the colouring matter with which they are impregnated. This solvent power, according to our author, is manifest in many other instances besides those already mentioned. Silk is whitened by the carbonated vapours of sulphur; and this operation does not appear to differ from the change effected on flowers by the same vapour. The light of the sun is found to be a necessary and essential agent in bleaching linen, wax, and various other substances; some part of the colouring matter which impairs the whiteness of these bodies not yielding to any other solvent. Red flowers are whitened by the electric spark, of whose inflammable nature we cannot entertain the least doubt; for the spark itself is a bright flame, and yields the same smell which all other carbonated matters impart. The electric spark, in like manner, changes the blue infusion of turnsole to red (B). The effects which it produces on the turnsole, and on red flowers, do not differ from each other, except in degree only. For when vegetable matter is dissolved, it is changed from blue to red; and, when farther dissolved, it is divided into particles too minute to exhibit any colour.

33
How to distinguish the solutions made by carbonate from those made by acids.

Solutions effected by means of phlogiston frequently are wrongly attributed to the operation of supposed acid menstrea, as several kinds of substances are capable of being dissolved indiscriminately both by acids and phlogiston. For the purpose of distinguishing, therefore, in any case between the action of the acid solvents and that of the inflammable menstrea, it is proper to examine the nature of the matter by which either of these principles are furnished. It appears from various chemical processes, that alkalies are rendered mild, and capable of crystallization, in proportion as they are united to carbone. The carbonated alkaline lixivium, when saturated, is perfectly mild; and by a slight evaporation is reduced to a concrete crystalline mass, which does not deliquesce or imbibe the least moisture from the air, and no longer retains any alkaline property. M. Beaulieu, by an elegant and ingeni-

ous experiment, has proved the presence of carbone in mild alkalies, and has shown that their power of crystallizing depends on their union with that principle. He heated in a silver vessel a lixivium of mild alkali, which imparted to the silver a covering or coating of inflammable matter, by which its surface was tarnished and became black. The lixivium was several times poured out of the silver vessel, and after the surface of the metal had been freed from the tarnish, the lixivium was replaced in it, and again heated, by which the tarnish was renewed; and this was repeated till the lixivium no longer communicated any stain to the silver. The causticity of the lixivium was increased in proportion as it imparted its carbone to the silver; and at the end of the process the alkali became perfectly caustic and incapable of crystallizing.

"From the preceding experiments (says he) it appears, that the colouring particles of flowers and leaves are soluble in acid, alkaline, and carbonated menstrea. The other parts of vegetables consist of materials similar to those which are contained in their flowers and leaves, and undergo the same changes from the same causes. Having extracted from logwood its colouring particles by repeatedly boiling it in water, the wood was thus deprived of its yellow colour, and assumed a brown hue similar to that of oak-wood. Some pieces of it thus deprived of its colour were then macerated in nitric acid; and after they had undergone the action of that acid, they were washed in a sufficient quantity of water. The wood was thus reduced to whiteness."

Here our author observes, that though most authors who treat of colouring substances describe logwood as a red colour, he was never able to procure any other colour from it than yellow. It imparts yellow and orange colours to distilled water. Other waters extract a red tinge from it by means of the alkali which they contain. These observations are also applicable to the other dyeing woods, kermes, and various other articles of the materia tinctoria. By a similar treatment, fustic wood also lost its colouring matter, and became white.

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Logwood afford only a yellow tincture with water.

The results of all the experiments above related are, that the colouring matter of plants does not exhibit any colour by reflection, but by transmission only; that their solid earthy substance is a white matter; and that it is the only part of vegetables which is endowed with a reflective power; that the colours of vegetables are produced by the light reflected from this white matter, and transmitted from thence through the coloured coat or covering which is formed on its surface by the colouring particles; that whenever the colouring matter is either discharged or divided by solution into particles too minute to exhibit any colour, the solid earthy substance is exposed to view, and displays that whiteness which is its distinguishing characteristic.

Mr Delaval next proceeds to examine the coloured parts of animal substances, and finds them exactly similar, with regard to the manner in which the colour is

35
Coloured matter of animal substances.

(B) This effect of the electric spark is now known to be produced, not by its carbonated nature, but by the generation of an acid.

is produced, to the vegetable bodies already treated of. The tinctures and infusions of cochineal and of kermes yield their colours when light is transmitted through them, but show none by reflection. On diluting fresh ox-gall with water, and examining it in the phials already mentioned, that part of it which was in the neck of the phial, and viewed by transmitted light, was yellow; but the anterior surface was black and reflected no colour. Flesh derives its colour entirely from the blood, and when deprived of it, the fibres and vessels are perfectly white; as are likewise the membranes, sinews, and bones, when freed from their aqueous and volatile parts; in which case they are a mere earth, unalterable by fire, and capable of imparting an opaque whiteness to glafs.

³⁶
Of the colour of blood.

On examining blood diluted with water in one of the phials formerly described, it transmitted a red colour, and the anterior surface was almost, but not entirely, black; for it received a slight hue of brown from some coagulated particles that were suspended in the liquor. In order to procure blood sufficiently diluted, and at the same time equably and perfectly dissolved, he mixed as much cruor with spirit of sal ammoniac as imparted a bright colour to it. The liquor being then viewed in the phial, that part which was contained in the neck, and transmitted the light, appeared of a fine red; but the anterior part reflecting no light, was intensely black. Hence it appears, that the florid red colour of the flesh arises from the light which is reflected from the white fibrous substance, and transmitted back through the red transparent covering which the blood forms on every part of it.

Blood, when recently drawn, does not assume the appearance common to transparent coloured liquors; for these, when too massy to transmit light from their farther surfaces, always appear black; but blood, when recently drawn, always shows a fine red colour, in whatever way it be viewed. This is occasioned by a white matter diffused through the blood; and which is easily separated from the cruor, by dividing it after coagulation into a number of thin pieces, and washing in a sufficient quantity of pure water. Thus the water acquires a red colour, and ought to be changed daily. In a few days it will acquire no more tinge; and the remaining masses of the cruor are no longer red, but white.

³⁷
Of the shells of lobsters.

In like manner, the red colour of the shells of lobsters, after boiling, is no more than a mere superficial covering spread over the white calcareous earth of which the shells are composed, and may be easily removed from the surface by scraping or filing. Before the application of heat, this superficial covering is much denser, inasmuch that, in some parts of the shell, it appears quite black, being too thick to admit the passage of the light to the shell and back again; but where this transparent blue colour of the unboiled lobster is thinner, it constantly appears like a blue film. In like manner, the colours of the eggs of certain birds are entirely superficial, and may be scraped off, leaving the white calcareous earth exposed to view.

³⁸
Of feathers.

The case is the same with feathers, which owe their colours entirely to a very thin layer of some transparent matter upon a white ground. Our author ascertained this by scraping off the superficial colours from certain feathers which were strong enough to bear the

operation; and thus separated the coloured layers from the white ground on which they had been naturally spread. The lateral fibres of the feathers cannot indeed have their surfaces separated in this manner; but their texture, when viewed by a microscope, seems to indicate, that the colours are produced upon them by no other means than those already related. In the examination of some animal subjects, where the colouring matter could not be separated by chemical means, our author had recourse to mechanical division; but this can only be employed when the principal part of the white substance is unmixed with the coloured coat or covering which is spread upon its surface. All of them, however, by whatever means their colours could be separated, showed that they were produced in the same manner, namely, by the transmission of light from a white ground through a transparent coloured medium.

The coloured substances of the mineral kingdom are ³⁹ very numerous, and belong principally to two classes, ^{Of the colours of mineral substances.} viz. earths and metals. The former, when pure, are all perfectly white, and their colours arise from carbonic or metallic mixtures. Calcareous earths, when indurated, constitute marble, and may be tinged with various colours by means of metallic solutions: all which are similar in their nature to the dyes put upon silk, cotton, or linen, and invariably proceed from the same cause, viz. the transmission of light through a very thin and transparent coloured medium. Flints are formed from siliceous earths, and owe their colour to carbone. When sufficiently heated, they are rendered white by the loss of the inflammable matter which produced their colour. When impregnated with metals, they form agates, cornelians, jasper, and coloured crystals. The coloured gems also receive their different hues from metals; and all of them may be imitated by glasses tinged with such carbonic or metallic matters as enter into the composition of the original substances.

Thus our author concludes, that the coloured earths, ⁴⁰ ^{Of metals.} gems, &c. exhibit their various tints in the same manner with other substances; viz. by the transmission of light reflected from a white ground. Our author, however, proceeds farther; and asserts, that even the colours of metals themselves are produced in the same manner.

“Gold (says he) exhibits a white light, which is tinged with yellow. I have used this expression, because it appears from experiment that gold reflects a white light, and that its yellow colour is a tinge super-added to its whiteness. The experiment is thus set forth by Sir Isaac Newton. Gold in this light (that is, a beam of white light) appears of the same yellow colour as in day light, but by intercepting at the lens a due quantity of the yellow-making rays, it will appear white like silver, as I have tried; which shows, that its yellowness arises from the excess of the intercepted rays, tinging that whiteness with their colour when they are let pass.

“I have already shown, by numerous experiments, in what manner coloured tinges are produced; and it uniformly appears, from all these experiments, that colours do not arise from reflection, but from transmission only. A solution of silver is pellucid and colourless. A solution of gold transmits yellow, but reflects

fects no colour. This metal also, when united with glass, yields no colour by reflection, but by transmission only. All these circumstances seem to indicate, that the yellow colour of gold arises from a yellow transparent matter, which is a constituent part of that metal; that it is equally mixed with the white particles of the gold, and transmits the light which is reflected by them, in like manner as when silver is gilt, or foils are made by covering white metals with transparent colours. But these factitious coverings are only superficial; whereas the yellow matter of gold is diffused throughout the whole substance of the metal, and appears to envelope and cover each of the white particles. In whatsoever manner the yellow matter of gold is united to its white substance, it exists in a rare state; for it bears only the same proportion to the white particles of the gold as that of the yellow-making rays which were intercepted bear to all the other rays comprised in the white light of the sun.

“Sir Isaac Newton has shown, that when spaces or interstices of bodies are replenished with media of different densities, the bodies are opaque; that those superficies of transparent bodies reflect the greatest quantity of light which intercede media that differ most in their refractive densities; and that the reflections of very thin transparent substances are considerably stronger than those made by the same substances of a greater thickness. Hence the minute portions of air, or of the rarer medium which occupies spaces void of other matter, reflect a vivid white light whenever their surfaces are contiguous to media whose densities differ considerably from their own; so that every small mass of air, or of the rarer medium, which fills the pores or interstices of dense bodies, is a minute white substance. This is manifest in the whiteness of froth, and of all pellucid colourless bodies; such as glass, crystal, or salts, reduced to powder, or otherwise flawed: for in all these instances a white light is reflected from the air or rarer medium which intercede the particles of the denser substances whose interstices they occupy.”

From these principles our author takes occasion to explain the reason why the particles of metals, which yield no colour by incident light when suspended in their solvents, are disposed to exhibit colours when separated from them. Hence also we see why opaque white substances are rendered pellucid by being reduced to uniform masses, whose component parts are every where nearly of the same density; for as all pellucid substances are rendered opaque and white by the admixture of pellucid colourless media of considerably different densities, they are again deprived of their opacity by extricating these media which kept their particles at a distance from each other: thus froth or snow, when resolved into water, lose their whiteness, and assume their former pellucid appearance. In like manner, by proper fluxes, the opaque white earths are reduced to pellucid colourless glasses; because all reflections are made at the surfaces of bodies differing in density from the ambient medium, and in the confines of equally dense media there is no reflection.

As the oxides of metals are enabled to reflect their colours by the intervention of the particles of air; so, when mixed with oil in the making of paints, they al-

ways assume a darker colour, because the excess of the density of oil over that of air forms a sensible difference when comparatively considered with respect to the specific gravity of the rarer metals. From this cause perceptibly less light is reflected from the molecule of oil than from those of air, and consequently the mass appears darker. The case, however, is different with such paints as are formed of the denser metals; as vermilion, minium, &c. for though oil differs very considerably from air in its specific density, yet it also differs very much in this respect from the denser metallic powders; and the molecule of oil which divide their particles act upon the light so strongly, that the reflection occasioned by them cannot be distinguished from those which are caused by rarer media. Hence though we mix vermilion or minium with oil, the colour is not sensibly altered.

This part of our author's theory, however, seems liable to objection: for though it be true, that the oxides of some metals are denser than others, yet that is, comparatively speaking, but in a very small proportion; nor is even the difference of density between oil and the oxides of the heavier metals at all comparable to that between the density of air and oil. Thus, though the oxide of iron may be 10 or 11 times more dense than oil; yet, as the latter is between 500 or 600 times denser than air, the small difference between the oil and metallic oxide ought to be imperceptible. In this respect, indeed, there are considerable differences with regard to the oils employed, which cannot be supposed to arise from the mere circumstance of density. Thus the colour of vermilion, when mixed with turpentine varnish, is much brighter than with linseed-oil; and yet the difference between the densities of linseed-oil and turpentine-varnish is very trifling. The mere action of heat likewise has a surprising effect in this case. Thus the red oxide of iron, called *scarlet oker*, by being only heated a certain degree, appears of a very dark purple, resuming its red colour when cold; and this variation may be induced as often as we please by only heating it over the fire in a shovel. In like manner, by gradually heating red-lead, it may be made to assume a most beautiful crimson colour; which growing gradually darker, becomes at last almost quite black. On cooling, if the heat has not been raised too high, it gradually returns through the same shades of colour, until at last it fixes in its original hue. These immense differences in colour cannot by any means be attributed either to the expulsion of air, or to an alteration in density. The fire indeed does certainly expand these oxides as well as other bodies; but as the medium interspersed between their particles is thus also expanded, the colour ought at least to remain the same, if not to become lighter, on account of the superior expansion of air to that of metal by the same degree of heat. It would seem, therefore, that the action of the element of fire itself has a considerable share in the production of colours; and indeed its share in the operations of nature is so great, that we might well think it strange if it should be entirely excluded from this.

With regard to semipellucid substances, which appear of one colour by incident, and another by transmitted light, our author likewise endeavours to show that no reflection is made by the coloured matter, but

⁴¹ Objections to his theory of metallic colours.

⁴² Of the colours of semipellucid substances.

only by the white or colourless particles. They consist of pellucid media, throughout which white or colourless opaque particles are dispersed. The latter are disposed at such distances from each other, that some of the incident rays of light are capable of passing through the intervals which intercede them, and thus are transmitted through the semipellucid mass. Some sorts of rays penetrate through such masses, while others which differ from them in their refrangibility are reflected by the white or colourless particles; and from thence are transmitted through the pellucid part of the medium which intervenes between the reflecting particles and the anterior surface of the mass. On the same principle our author explains the blue colour of the sky, the green colour of the sea, and other natural phenomena: and from his numerous experiments on this subject at last concludes, "that the power by which the several rays of light are transmitted through different media is inherent in the particles themselves, and therefore is not confined to the surfaces of such media. For if the transmissive force was exerted at the surface only, the thinner plates of coloured substances would act upon the rays as powerfully as thicker masses. But it appears from experiment, that in proportion as the rays pass through different thicknesses of coloured media, they exhibit colours differing not only in degree, but frequently in species also.

43
How colours are shown by transmitted light.

"The sun's light, by which bodies are illuminated, consists of all the rays of which a white light is compounded. These rays, in their entire and undivided state, are incident upon the opaque particles of semipellucid substances, and upon the colouring particles of transparent-coloured substances, whenever these media are exposed to the light. When the rays accede to the opaque particles of semipellucid substances, some sorts of them are reflected back from the anterior surface of those particles: the other sorts of rays, which are not reflected back, are diverted from the direction which is opposite to the anterior surface of the opaque particles, and passing through the intervals between the particles, are transmitted through the mass.

"When the rays are incident upon the particles of transparent coloured bodies, none of them are reflected back; because the colouring particles are not endowed with any reflective power; but some of the rays are either stopped at the anterior surface of the particles, or are diverted into such directions as render them incapable of passing towards the further side of the mass; and consequently such rays cannot be transmitted. The rays which are not thus intercepted or dispersed, are transmitted in the same manner as those which pass through semipellucid media. Thus it is evident, that the coloured rays which are transmitted through semipellucid substances are *inflected* by the opaque particles; and those which are transmitted through transparent-coloured substances are *inflected* by the colouring particles. From the preceding observations likewise it appears, that the particles of coloured media inflect the several sorts of rays according to the several sizes and densities of the particles; also in proportion to the inflammability of the media which owe their colour to them; and it is manifest that the transmission of coloured rays depends upon their inflection. All these observations are conformable to Sir Isaac Newton's doc-

trine, that the rays of light are reflected, refracted, and inflected, by one and the same principle acting variously in various circumstances."

The most remarkable part of Mr Delaval's doctrine is that concerning the metals; for the better understanding of which we shall premise a short abstract of his general doctrine concerning white bodies, and the manner in which light is reflected by them. "All the earths (he observes), which in their natural state are of a pure white, constitute transparent colourless media when vitrified with proper fluxes, or when dissolved in colourless menstrua; and the saline masses obtainable from their solutions are transparent and colourless, while they retain the water which is essential to their crystallization, and are not flawed or reduced to powder; but after their pores and interstices are opened in such a manner as to admit the air, they become then white and opaque by the entrance of that rare medium. The earthy particles which form the solid parts of bodies generally exceed the other in density; consequently these particles, when contiguous to the rare media already mentioned, must reflect the rays of light with a force proportionate to their density. The reflective power of bodies does not depend merely upon their excess of density, but upon their difference of density with respect to the surrounding media. Transparent colourless particles, whose density is greatly inferior to that of the media they come between, also powerfully reflect all sorts of rays, and thereby become white. Of this kind are the air or other rare fluids which occupy the interstices of liquors; and in general of all denser media into whose interstices such rare particles are admitted.

44
Of the manner in which light is reflected from white bodies.

"Hence we may conclude, that white opaque bodies are constituted by the union or contiguity of two or more transparent colourless media differing considerably from each other in their reflective powers. Of these substances we have examples in froth, emulsions, or other imperfect combinations of pellucid liquors, milk, snow, calcined or pulverized salts, glass or crystal reduced to powder, white earths, paper, linen, and even those metals which are called white by mineralogists and chemists: for the metals just mentioned do not appear white unless their surfaces be rough; as in that case only there are interstices on their surfaces sufficient to admit the air, and thus make a reflection of a white and vivid light.

"But the polished surfaces of metallic mirrors reflect the incident rays equably and regularly, according to their several angles of incidence; so that the reflected rays do not interfere with each other, but remain separate and unmixed, and therefore distinctly exhibit their several colours. Hence it is evident, that white surfaces cannot act upon the light as mirrors; because all the rays which are reflected from them are blended in a promiscuous and disorderly manner.

"The above-mentioned phenomena give much insight into the nature and cause of opacity: as they clearly show, that even the rarest transparent colourless substances, when their surfaces are adjacent to media differing greatly from them in refractive power, may thereby acquire a perfect opacity, and may assume a resplendency and hue so similar to that of white metals, that the rarer pellucid substances cannot by the

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Of the cause of opacity.

light

light be distinguished from the dense opaque metals. And this similarity to the surfaces of metals occurs in the rare pellucid substances, not only when, from the roughness of their surfaces, they resemble unpolished metals in whiteness, but also when, from their smoothness, they resemble the polished surfaces of metals.

“Metals seem to consist entirely of transparent matter, and to derive their apparent opacity and lustre solely from the copious reflection of light from their surfaces. The analogy between the metals and transparent media, as far as respects their optical properties, will appear from the following considerations.”

“1. All metals dissolved in their proper menstrua are transparent. 2. By the union of two or more transparent media, substances are constituted which are similar to metals in their opacity and lustre, as plumbago and marcasites. 3. The transparent substances of metals, as well as those of minerals, by their union with carbone, acquire their strong reflective powers from which their lustre and opacity arise. 4. The surfaces of pellucid media, such as glass or water, assume a metallic appearance, when by their smoothness, difference of density with respect to the contiguous media, or any other cause, they are disposed copiously to reflect the light.

“From all these considerations it is evident, that opaque substances are constituted by the union or contiguity of transparent colourless media, differing from one another in their reflective powers; and that, when the common surface, which comes between such media, is plane, equal, and smooth, it reflects the incident rays equally and regularly as a mirror; but when the surface is rough and unequal, or divided into minute particles, it reflects the incident rays irregularly and promiscuously in different directions, and consequently appears white.”

From all these experiments we can only conclude, that the theory of colours seems not yet to be determined with certainty; and very formidable, perhaps unanswerable, objections might be brought against every hypothesis on this subject that hath been invented. The discoveries of Sir Isaac Newton, however, are sufficient to justify the following

A P H O R I S M S.

1. All the colours in nature proceed from the rays of light.
2. There are seven primary colours; which are red, orange, yellow, green, blue, indigo, and violet.
3. Every ray of light may be separated into the seven primary colours.
4. The rays of light in passing through the same medium have different degrees of refrangibility.
5. The difference in the colours of light arises from its different refrangibility: that which is the least refrangible producing red; and that which is the most refrangible, violet.
6. By compounding any two of the primary colours,

as red and yellow, or yellow and blue, the intermediate colour, as orange or green, may be produced.

7. The colours of bodies arise from their dispositions to reflect one sort of rays, and to absorb the other; those that reflect the least refrangible rays appearing red; and those that reflect the most refrangible, violet.

8. Such bodies as reflect two or more sorts of rays appear of various colours.

9. The whiteness of bodies arises from their disposition to reflect all the rays of light promiscuously.

10. The blackness of bodies proceeds from their incapacity to reflect any of the rays of light (c).

Entertaining EXPERIMENTS, founded on the preceding Principles.

I. *Out of a single colourless ray of light to produce seven other rays, which shall paint, on a white body, the seven primary colours of nature.*

Procure from an optician a large glass prism DEF, well polished, two of whose sides must contain an angle of about sixty-four degrees. Make a room quite dark, and in the window shutter AB, cut a round hole, about one-third of an inch in diameter, at C, through which a ray of light LI passing, falls on the prism DEF; by that it is refracted out of the direction IT, in which it would have proceeded into another GH; and, falling on the paper MNSX, will there form an oblong spectrum PQ, whose ends will be semicircular, and its sides straight; and if the distance of the prism from the paper be about eighteen feet, it will be ten inches long, and two inches wide. This spectrum will exhibit all the primary colours; the rays between P and V, which are the most refracted, will paint a deep violet; those between V and I, indigo; those between I and B, blue; those between B and G, green; those between G and Y, yellow; those between Y and O, orange; and those between O and R, being the least refracted, an intense red. The colours between these spaces will not be everywhere equally intense, but will incline to the neighbouring colour: thus the part of the orange next to R will incline to a red, that next to Y to a yellow; and so of the rest.

Plate CXLV. Fig. 1.

II. *From two or more of the primary colours, to compose others that shall, in appearance, resemble those of the former.*

By mixing the two homogeneous colours red and yellow, an orange will be produced, similar in appearance to that in the series of primary colours; but the light of the one being homogeneous, and that of the other heterogeneous, if the former be viewed through a prism it will remain unaltered, but the other will be resolved into its component colours, red and yellow. In like manner, other contiguous homogeneous colours may compound new colours; as by mixing yellow and green, a colour between them is formed; and if blue be added, there will appear a green, that is the middle

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Theory of
colours still
uncertain.

(c) From hence it arises, that black bodies, when exposed to the sun, become sooner heated than all others.

colour of those three. For the yellow and blue, if they are equal in quantity, will draw the intermediate green equally toward them, and keep it, as it were, in equilibrio, that it verge not more to the one than to the other. To this compound green there may be added some red and violet; and yet the green will not immediately cease, but grow less vivid; till by adding more red and violet it will become more diluted; and at last, by the prevalence of the added colours, it will be overcome, and turned into some anomalous colour.

If the sun's white, composed of all kinds of rays, be added to any homogeneous colour, that colour will not vanish, nor change its species, but be diluted; and by adding more white, it will become continually more diluted. Lastly, if red and violet be mixed, there will be generated, according to their various proportions, various purples, such as are not like, in appearance, to the colour of any homogeneous light; and of these purples, mixed with blue and yellow, other new colours may be composed.

III. *Out of three of the primary colours, red, yellow, and blue, to produce all the other prismatic colours, and all that are intermediate to them.*

Fig. 2.

Provide three panes of glass of about five inches square; and divide each of them, by parallel lines, into five equal parts. Take three sheets of very thin paper; which you must paint, lightly, one blue, another yellow, and the third red (D). Then paste on one of the glasses five pieces of the red paper, one of which must cover the whole glass, the second only the four lower divisions, the third the three lower, the fourth the two lowest, and the fifth the last division only. On the other glasses five pieces of the blue and yellow papers must be pasted in like manner. You must also have a box of about six inches long, and the same depth and width as the glasses; it must be black on the inside: let one end be quite open, and in the opposite end there must be a hole large enough to see the glasses completely. It must also open at the top, that the glasses may be placed in it conveniently.

When you have put any one of these glasses in the box, and the open end is turned toward the sun, you will see five distinct shades of the colour it contains. If you place the blue and yellow glasses together, in a similar direction, you will see five shades of green distinctly formed. When the blue and red glasses are

placed, a bright violet will be produced: and by the red and yellow, the several shades of orange.

If, instead of placing these glasses in a similar position, you place the side AB of the yellow glass against the side BD of the blue, you will see all the various greens that are produced by nature (E); if the blue and red glasses be placed in that manner, you will have all the possible varieties of purples, violets, &c.; and, lastly, if the red and orange glasses be so placed, there will be all the intermediate colours, as the marygold, aurora, &c.

IV. *By means of the three primary colours, red, yellow, and blue, together with light and shade, to produce all the gradations of the prismatic colours.*

On seven square panes of glass, paste papers that are painted with the seven prismatic colours, in the same manner as in the last experiment. The colours for the orange, green, indigo, and violet, may be made by mixing the other three. Then with bistre (F), well diluted, shade a sheet of very thin paper, by laying it light on both its sides. With pieces of this paper cover four-fifths of a glass, of the same size with the others, by laying one piece on the four lowest divisions, another on the three lowest, a third on the two lowest, and the fourth on the lowest division only, and leaving the top division quite uncovered. When one of the coloured glasses is placed in the box, together with the glass of shades, so that the side AB of the one be applied to the side BC of the other, as in fig. 3, the several gradations of colours will appear shaded in the same manner as a drapery judiciously painted with that colour.

It is on this principle that certain French artists have proceeded in their endeavours to imitate, by designs printed in colours, paintings in oil: which they do by four plates of the same size, on each of which is engraved the same design. One of these contains all the shades that are to be represented, and which are painted either black or with a dark gray. One of the three other plates is coloured with blue, another with red, and the third with yellow; each of them being engraved in those parts only which are to represent that colour (G); and the engraving is either stronger or weaker, in proportion to the tone of colour that is to be represented (H).

These four plates are then passed alternately under the

(D) Water-colours must be used for this purpose: the blue may be that of Prussia, and very bright; the red, carmine; and the yellow, gamboge, mixed with a little saffron. These colours must be laid very light and even, on both sides of the paper.

(E) In the first position of the glasses, the quantity of blue and yellow being equal, the same sort of green was constantly visible: but by thus inverting the glasses, the quantity of the colours being constantly unequal, a very pleasing variety of tints is produced.

(F) The bistre here used must be made of foot, not that in stone.

(G) When a red drapery is required, it is engraved on the plate assigned to that colour; and so of yellow and blue: but if one of the other colours be wanting, suppose violet, it must be engraved on those that print the red blue: and so of the rest. The plates of this kind have been hitherto engraved in the manner of mezzotinto; but these, unless they are skilfully managed, are soon effaced. Engravings in the manner of the crayon will perhaps answer better.

(H) The principal difficulty in this sort of engraving arises from a want of a skilful management, in giving each plate that precise degree of engraving which will produce the tone of colour required. If a bright green is

the press, and the mixture of their colours produces a print that bears no small resemblance to a painting. It must be confessed, however, that what has been hitherto done of this kind falls far short of that degree of perfection of which this art appears susceptible. If they who engrave the best in the manner of the erayon, were to apply themselves to this art, there is reason to expect they would produce far more finished pieces than we have hitherto seen.

V. *To make figures appear of different colours successively.*

Fig. 4.

Make a hole in the window-shutter of a dark room, through which a broad beam of light may pass, that is to be refracted by the large glass prism ABC, which may be made of pieces of mirrors cemented together, and filled with water. Provide another prism DEF, made of three pieces of wood, through the middle of this there must pass an axis on which it is to revolve. This prism must be covered with white paper; and each of its sides cut through in several places, so as to represent different figures; and those of each side should likewise be different. The inside of this prism is to be hollow, and made quite black, that it may not reflect any of the light that passes through the sides into it. When this prism is placed near to that of glass, as in the figure, with one of its sides EF perpendicular to the ray of light, the figures on that side will appear perfectly white: but when it comes into the position *g b*, the figures will appear yellow and red; and when it is in the position *k l*, they will appear blue and violet. As the prism is turned round its axis, the other sides will have a similar appearance. If, instead of a prism, a four or five sided figure be here used, the appearances will be still further diversified.

This phenomenon arises from the different refrangibility of the rays of light. For when the side EF is in the position *g b*, it is more strongly illuminated by the least refrangible rays; and wherever they are predominant, the object will appear red or yellow. But when it is on the position *k l*, the more refrangible rays being then predominant, it will appear tinged with blue and violet.

VI. *The solar magic lantern.*

Procure a box, of about a foot high, and eighteen inches wide, or such other similar dimensions as you shall think fit, and about three inches deep. Two of the opposite sides of this box must be quite open; and in each of the other sides let there be a groove, wide enough to pass a stiff paper or pasteboard. This box must be fastened against a window on which the sun's rays fall direct. The rest of the window should be closed up, that no light may enter. Provide several sheets of stiff paper, which must be blacked on one side. On these papers cut out such figures as you shall think proper; and placing them alternately in the grooves of the box, with their blacked sides towards you, look at them through a large and clear glass prism: and if the light be strong, they will ap-

pear to be painted with the most lively colours in nature. If you cut on one of these papers the form of the rainbow, about three quarters of an inch wide, you will have a lively representation of that in the atmosphere.

This experiment may be farther diversified, by passing very thin papers, lightly painted with different colours, over some of the parts that are cut out: which will appear to change their colours when viewed through the prism, and to stand out from the paper, at different distances, according to the different degrees of refrangibility of the colours with which they are painted. For greater convenience, the prism may be placed in a stand on a table, at the height of your eye, and made to turn round on an axis, that when you have got an agreeable prospect, you may fix it in that position.

VII. *The prismatic camera obscura.*

Make two holes *F, f*, in the shutter of a dark chamber, near to each other; and against each hole place a prism ABC, and *a b c*, in a perpendicular direction, that their spectrums NM may be cast on the paper in a horizontal line, and coincide with each other; the red and violet of the one being in the same part with those of the other. The paper should be placed at such a distance from the prisms that the spectrum may be sufficiently dilated. Provide several papers nearly of the same dimensions with the spectrum; cross these papers, and draw lines parallel to the divisions of the colours. In these divisions cut out such figures as you shall find will have an agreeable effect, as flowers, trees, animals, &c. When you have placed one of these papers in its proper position, hang a black cloth or paper behind it, that none of the rays that pass through may be reflected and confuse the phenomena. The figures cut on the paper will then appear strongly illuminated with all the original colours of nature. If, while one of the prisms remains at rest, the other be revolved on its axis, the continual alteration of the colours will afford a pleasing variety; which may be further increased by turning the prism round in different directions.

When the prisms are so placed that the two spectrums become coincident in an inverted order of their colours, the red end of one falling on the violet end of the other; if they be then viewed through a third prism DH, held parallel to their length, they will no longer appear coincident, but in the form of two distinct spectrums, *p t* and *n m* (fig. 6.), crossing one another in the middle, like the letter X: the red of one spectrum and the violet of the other, which were coincident at NM, being parted from each other by a greater refraction of the violet to *p* and *m*, than that of the red to *n* and *t*.

This experiment may be further diversified by adding two other prisms, that shall form a spectrum in the same line, and contiguous to the other; by which not only the variety of figures, but the vicissitude of colours, will be considerably augmented.

VIII.

is to be represented, there should be an equal quantity of engraving on the red and yellow plates: but if an olive green, the yellow plate should be engraved much deeper than the red.

VIII. *The diatonic scale of colours.*

The illustrious Newton, in the course of his investigations of the properties of light, discovered that the length of the spaces which the seven primary colours possess in the spectrum, exactly corresponds to those of chords that found the seven notes in the diatonic scale of music: As is evident by the following experiment.

Fig. 7.

On a paper in a dark chamber, let a ray of light be largely refracted into the spectrum AFTMGP, and mark the precise boundaries of the several colours, as *a, b, c, &c.* Draw lines from those points perpendicular to the opposite side, and you will find that the spaces *M r f F*, by which the red is bounded; *r g e f*, by which the orange is bounded; *q p e d*, by which the yellow is bounded, &c. will be in exact proportion to the divisions of a musical chord for the notes of an octave; that is, as the intervals of these numbers 1, $\frac{9}{8}$, $\frac{5}{4}$, $\frac{4}{3}$, $\frac{3}{2}$, $\frac{5}{3}$, $\frac{6}{5}$.

IX. *Colorific music.*

Father Castel, a Frenchman, in a curious book he has published on chromatics, supposes the note *ut* to answer to blue in the prismatic colours; the note *re* to yellow, and *mi* to red. The other tones he refers to the intermediate colours; from whence he constructs the following gamut of colorific music:

Ut	Blue
Ut sharp	Sea green
Re	Bright green
Re sharp	Olive green
Mi	Yellow
Fa	Aurora
Fa sharp	Orange
Sol	Red
Sol sharp	Crimson
La	Violet
La sharp	Blue violet
Si	Sky blue
Ut	Blue.

This gamut, according to this plan, is to be continued in the same manner for the following octave; except that the colours are to be more vivid.

He supposes that these colours, by striking the eye in the same succession as the sounds (to which he makes them analogous) do the ear, and in the same order of time, they will produce correspondent sensations of pleasure in the mind. It is on these general principles, which F. Castel has elucidated in his treatise, that he has endeavoured, though with little success, to establish his ocular harpichord.

The construction of this instrument, as here explained, will show that the effects produced by colours by no means answer those of sounds, and that the principal relation there is between them consists in the duration of the time that they respectively affect the senses.

Between two circles of pasteboard, of ten inches diameter, AB and CD, inclose a hollow pasteboard

cylinder E, 18 inches long. Divide this cylinder into spaces half an inch wide, by a spiral line that runs round it from the top to the bottom, and divide its surface into six equal parts by parallel lines drawn between its two extremities: as is expressed in the figure.

Let the circle AB, at top, be open, and let that at bottom, CD, be closed, and supported by an axis or screw, of half an inch diameter, which must turn freely in a nut placed at the bottom of a box we shall presently describe. To the axis just mentioned adjust a wooden wheel G, of two inches and a half in diameter, and that has 12 or 15 teeth, which take the endless screw H. Let this cylinder be inclosed in a box ILMN (fig. 9.) whose base is square, and at whose bottom there is a nut, in which the axis F turns. Observe that the endless screw H should come out of the box, that it may receive the handle O, by which the cylinder is to be turned.

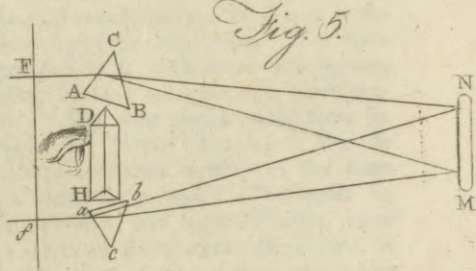
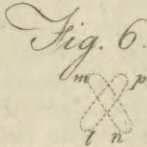
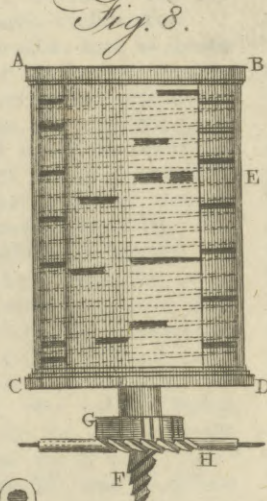
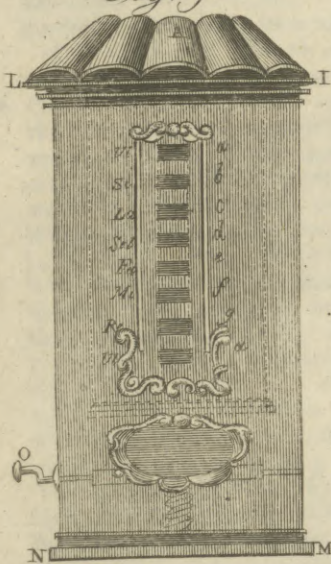
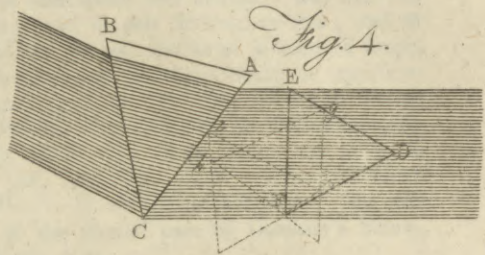
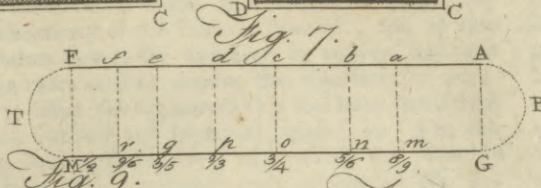
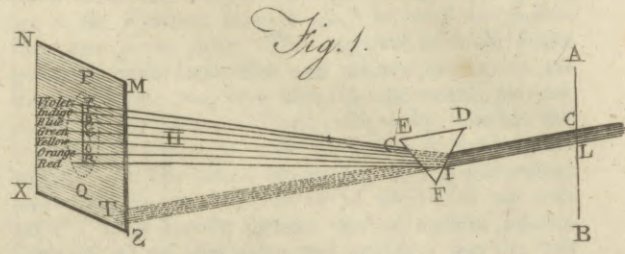
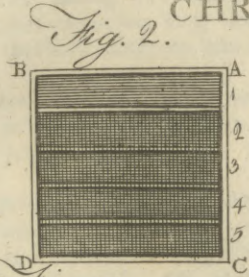
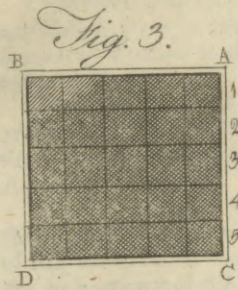
This box being closed all round, place over it a tin covering A, which will be perforated in different parts; from this cover there must hang three or four lights, so placed that they may strongly illumine the inside of the cylinder. In one side of this box (which should be covered with pasteboard) cut eight apertures *a, b, c, d, e, f, g, h*, of half an inch wide, and $\frac{1}{4}$ of an inch high; they must be directly over each other, and the distance between them must be exactly two inches. It is by these openings, which here correspond to the musical notes, that the various colours analogous to them are to appear; and which being placed on the pasteboard cylinder, as we have shown, are reflected by means of the lights placed within it. Fig. 9.

It is easy to conceive, that when the handle O is turned, the cylinder in consequence rising half an inch, if it be turned five times round, it will successively show, at the openings made in the side of the box, all those that are in the cylinder itself, and which are ranged according to the direction of the inclined lines drawn on it. It is therefore according to the duration of the notes which are to be expressed, that the apertures on the cylinder are to be cut. Observe, that the space between two of the parallel lines drawn vertically on the cylinder, is equal to one measure of time; therefore, for every turn of the cylinder, there are six measures, and thirty measures for the air that is to be played by this instrument.

The several apertures being made in the side of the cylinder, in conformity to the notes of the tune that is to be expressed, they are to be covered with double pieces of very thin paper, painted on both sides with the colours that are to represent the musical notes.

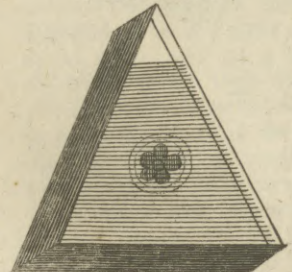
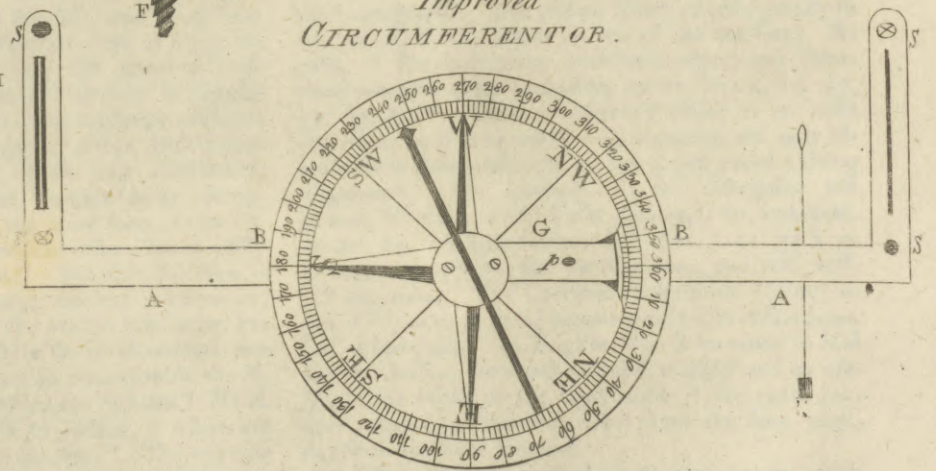
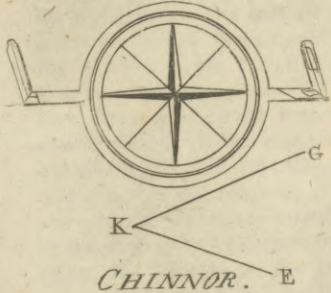
This experiment might be executed in a different manner, and with much greater extent; but as the entertainment would not equal the trouble and expence, we have thought it sufficient to give the above piece, by which the reader will be enabled to judge how far the analogy supposed by F. Castel really exists.

CHROMATICS.

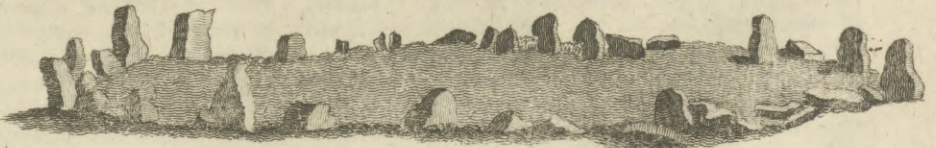


CIRCUMFERENTOR

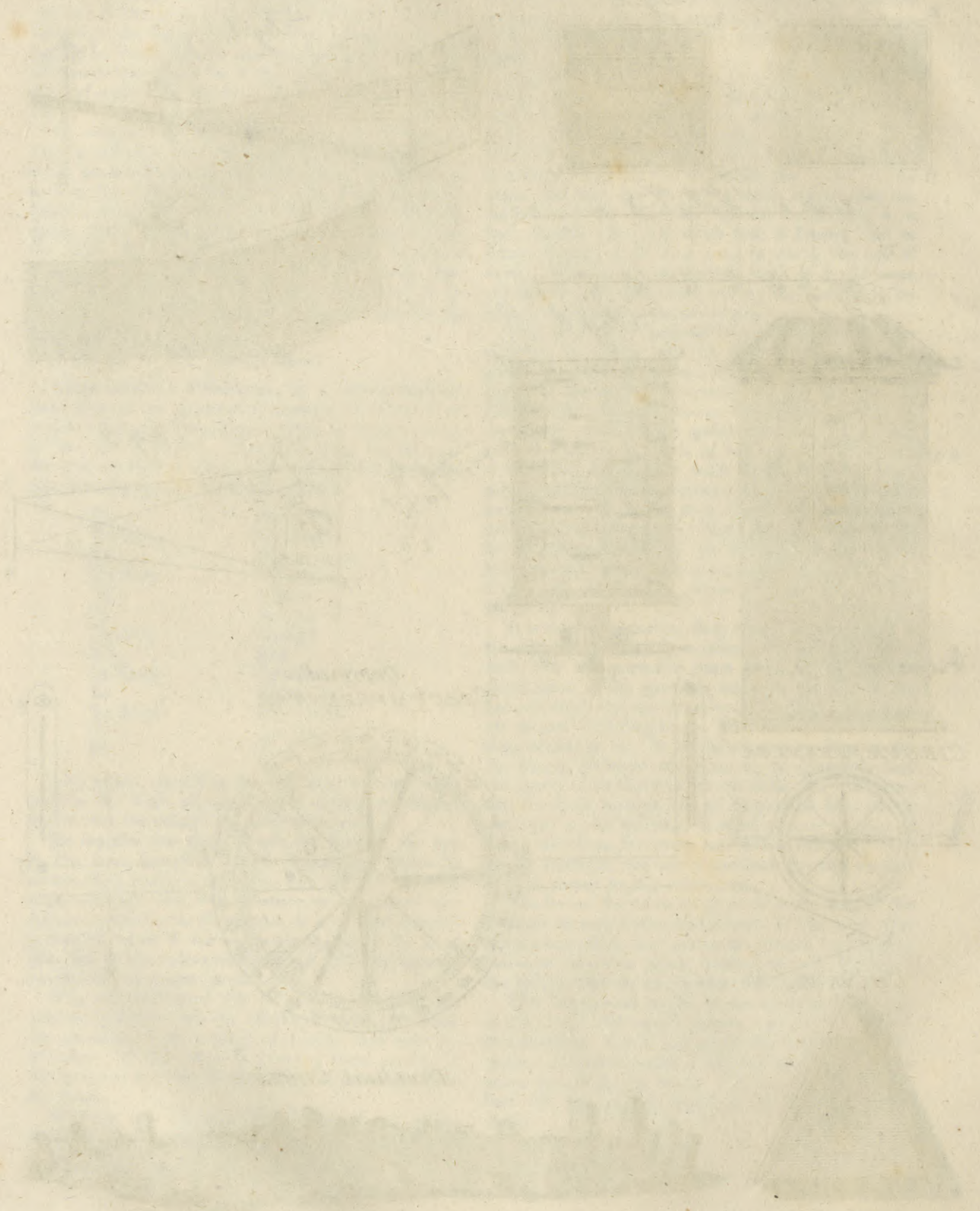
Improved CIRCUMFERENTOR.



Druidical CIRCLE.



A. Bell, Pin. Wat. Sculptor fecit.



Chronic,
Chronicle.

CHRONIC, or CHRONICAL, among physicians, an appellation given to diseases that continue a long time; in contradistinction to those that soon terminate, and are called *acute*.

CHRONICLE, in matters of literature, a species or kind of history disposed according to the order of time, and agreeing in most respects with annals. See ANNALS.

Parian CHRONICLE. See *ARUNDELIAN Marbles*. Since that article was printed, in which an abstract was given of Mr Robertson's doubts and observations respecting the authenticity of the Parian Chronicle, one or two publications have since appeared in answer, but none of them calculated to remove the objections, or materially to affect the arguments that had been stated with so much learning and ingenuity against it. The following strictures, however, with which the Monthly Reviewers have concluded their critique of Mr Robertson's performance, seem to merit consideration.

Monthly
Review.
Jan. 1789.

On Objection I. *That the characters have no certain or unequivocal marks of antiquity*, the Reviewers remark, that this seems rather to be an answer to a defender of the inscription, than an objection. If a zealous partizan of the marble should appeal to its characters and orthography, as decisive proofs of its being genuine, it would be proper enough to answer, that these circumstances afford no certain criterion of authenticity. But in this word *certain* sculks an unlucky ambiguity. If it means demonstrative, it must be allowed that no inscription can be proved to be certainly genuine from these appearances; but if it means no more than highly probable, many inscriptions possess sufficient internal evidence to give their claims this degree of certainty. The true question is, H. s not the Parian Chronicle every mark of antiquity that can be expected in a monument claiming the age of 2000 years? The letters Γ and Ξ are, by Mr R's own confession, such as occur in genuine inscriptions: and to say in answer, that an impostor might copy the forms of these letters from other inscriptions, is already to suppose the inscription forged, before it is rendered probable by argument. The learned author of the Dissertation seems to betray some doubt of his own conclusion: for he adds, p. 56. "that the antiquity of an inscription can never be proved by the mere form of the letters, because the most ancient characters are as easily counterfeited as the modern." But this objection is equally applicable to all other ancient inscriptions; and is not to the purpose, if the present inscription has any peculiar marks of imposture in its characters and orthography. "The characters do not resemble the Sigeian, the Nemean, or the Delian inscriptions." Mr R. answers this objection himself, by adding, "which are supposed to be of a more ancient date." The opposite reason to this will be a sufficient answer to the other objection, "that they do not resemble the Farnesian pillars or the Alexandrian MS." If "they differ in many respects from the Marmor Sandvicense," they may be presumed to agree in many. "They seem to resemble, more than any other, the alphabet taken by Montfaucon from the marmor Cyzicenum." Thus it appears that the Parian Chronicle most nearly resembles the two inscriptions, to whose age it most nearly approaches.

When Mr R. adds, that the letters "are such as

an ordinary stone-cutter would probably make, if he were employed to engrave a Greek inscription, according to the alphabet now in use," he must be understood *cum grano salis*. The engraver of a fac-simile generally omits some nice and minute touches in taking his copy; but, even with this abatement, we dare appeal to any adept in Greek calligraphy, whether the specimen facing p. 56. will justify our author's observation? "The small letters (O, Θ, Ω,) intermixed among the larger, have an air of affectation and artifice." Then has the greater part of ancient inscriptions an air of affectation and artifice. For the O is perpetually engraved in this diminutive size; and Ω being of a kindred sound, and Θ of a kindred shape, how can we wonder that all three should be represented of the same magnitude? In the inscription which immediately follows the marble in Dr Chandler's edition, N^o xxiv. these very three letters are never so large as the rest, and often much smaller; of which there are instances in the three first lines. See also two medals in the second part of Dorville's Sicilia, Tab. xvi. Numb. 7. 9.

"From the archaisms, such as *εγ Λυκαργειας, εγ Κυβελαις, εμ Παροι, &c. &c.* no conclusion can be drawn in favour of the authenticity of the inscription." Yet surely every thing common to it with other inscriptions, confessedly genuine, creates a reasonable presumption in its favour. "But what reason could there be for these archaisms in the Parian Chronicle? We do not usually find them in Greek writers of the same age, or even of a more early date." The reason is, according to our opinion, that such archaisms were then in use: this we know from other inscriptions, in which such archaisms (or, as our author afterwards calls them, barbarisms) are frequent. Nothing can be inferred from the Greek writers, unless we had their autographs. The present system of orthography in our printed Greek books is out of the question. Again, "The inscription sometimes adopts and sometimes neglects these archaisms, as in lines 4, 12, 27, 52, 63, 67." This inconsistency either is no valid objection, or if it be valid, will demolish not only almost every other inscription, but almost every writing whatsoever. For example, in the inscription just quoted, N^o xxiv. we find *τον βασιλια, l. 20. and οταμ, περιπη, 24.* A little farther. N^o xxvi. l. 31. we have *εΓ Μαγνησιος, 57. 73. 81. εΚ Μαγνησιος, and 106. 108. εΚΓ Μαγνησιος.* The Corcyrean inscription (Montfaucon, Diss. Ital. p. 420) promiscuously uses *εΚδανειζομαι, and εΓδανειζομαι.* In English, who is surprised to find *has and hath, a hand and an hand, a useful and an useful,* in the works of the same author? We could produce instances of this inaccuracy from the same page, nay from the same sentence.

"The authenticity of those inscriptions, in which these archaisms appear, must be established, before they can be produced in opposition to the present argument." This is, we cannot help thinking, rather too severe a restriction. If no inscription may be quoted before it be proved genuine, the learned author of the Dissertation need not be afraid of being confuted; for nobody will engage with him on such conditions. Perhaps the reverse of the rule will be thought more equitable; that every inscription be allowed to be genuine, till its authenticity be rendered doubtful

Chronicle. by probable arguments. We will conclude this head with two short observations. In Selden's copy, l. 26. was written ΠΟΙΗΣΙΝ, which the latter editions have altered to ΠΟΙΗΣΙΝ, but without reason, the other being the more ancient way of writing, common in MSS. and sometimes found on inscriptions. (See G. Koen's Notes on *Gregorius de Dialectis*, p. 30.) In l. 83. the marble has Καλλιου, for which Palmer wished to substitute Καλλιου. Dr Taylor refutes him from the *Marmor Sandvicense*, observing at the same time, that this orthography occurs in no other place whatever except in these two monuments. Is it likely that two engravers should by chance coincide in the same mistake, or that the forger of the Parian Chronicle (if it be forged) should have seen the *Marmor Sandvicense*, and taken notice of this peculiarity with the intention of afterward employing it in the fabrication of an imposture?

The reviewers next proceed to consider, but more briefly, the other objections.

II. *It is not probable that the Chronicle was engraved for private use.*—1. *Because it was such an expence, as few learned Greeks were able to afford.* If only a few were able to afford it, some one of those few might be willing to incur it. But let Mr R. consider how likely it is that a modern, and probably a needy Greek, should be more able to afford it in the last century, than a learned Greek 2000 years ago! 2. *A manuscript is more readily circulated.* Do men never prefer cumbrous splendor to cheapness and convenience? And if this composition, instead of being engraved on marble, had been committed to parchment, would it have had a better chance of coming down to the present age? Such a flying sheet would soon be lost; or, if a copy had, by miracle, been preserved to us, the objections to its being genuine would be more plausible than any that have been urged against the inscription. What Mr R. says about the errors to which an inscription is liable, &c. will only prove that chronological inscriptions ought not to be engraved; but not that they never were. We allow that the common method of writing in the reign of Ptolemy Philadelphus was NOT ON STONES. But it was common enough to occur to the mind of any person who wished to leave behind him a memorial at once of his learning and magnificence.

III. *This objection, that the marble does not appear to be engraved by public authority, we shall readily admit, though Bentley (Diff. on Phalaris, p. 251.) leans to the contrary opinion.* In explaining this objection, the learned dissertator observes, that though the expression, *αρχοντος εν Παρω*, would lead us to suppose that the inscription related to Paros, not a single circumstance in the history of that island is mentioned. But this expression only shows that the author was an inhabitant of Paros, and intended to give his readers a clue, or *parapegma*, by the aid of which they might adjust the general chronology of Greece to the dates of their own history. "It is as absurd as would be a marble in Jamaica containing the revolutions of England." We see no absurdity in supposing a book to be written in Jamaica containing the revolutions of England. The natives of Paros were not uninterested in events relating to the general history of Greece, particularly of Athens; and how can we tell whether the author were an *inquilinus*, or a native of the island;

whether he thought it a place beneath his care; or whether he had devoted a separate inscription to the chronology of Paros? Chronicle.

IV. *It has been frequently observed, that the earlier periods of the Grecian history are involved in darkness and confusion.* Granted. It follows then, that "an author who should attempt to settle the dates of the earlier periods would frequently contradict preceding, and be contradicted by subsequent, writers; that he would naturally fall into mistakes; and at best could only hope to adopt the most probable system. But the difficulty of the task, or the impossibility of success, are not sufficient to prove that no man has been rash or mad enough to make the attempt." On the contrary, we know that many have made it. What a number of discordant opinions has Mr R. himself given us from the ancients concerning the age of Homer? This consideration will in part obviate another objection, that the Parian Chronicle does not agree with any ancient author. For if the ancients contradict one another, how could it follow more than one of them? and why might not the author, without any imputation of ignorance or rashness, sometimes depart from them all? If indeed he disagrees with them when they are unanimous, it might furnish matter for suspicion; though even this would be far from a decisive argument, unless the ancients were so extremely unlike the moderns, as never to be fond of singular and paradoxical positions.

V. *This Chronicle is not once mentioned by any writer of antiquity.* How many of those inscriptions, which are preserved to the present day, are mentioned by classical authors? Verrius Flaccus composed a Roman kalendar, which, as a monument of his learning and industry, was engraved on marble, and fixed in the most public part of Preneste. Fragments of this very kalendar were lately dug up at Preneste, and have been published by a learned Italian. Now if the passage of Suetonius, which informs us of this circumstance, had been lost, would the silence of the Latin writers prove that the fragments were not genuine remains of antiquity? It may be said that the cafes are not parallel; for not a single author mentions the Parian Chronicle, whereas Suetonius does mention Verrius's Roman kalendar. To this we answer, It is dangerous to deny the authenticity of any monument on the slender probability of its being casually mentioned by a single author. We shall also observe, that this fact of the Hemicyclium of Verrius will answer some part of the Dissertator's second objection: "The Parian Chronicle is not an inscription that might have been concealed in a private library." Why not? it is of no extraordinary bulk; and might formerly have been concealed in a private library, or in a private room, with as much ease as many inscriptions are now concealed in very narrow spaces. But unless this monument were placed in some conspicuous part of the island, and obtruded itself on the notice of every traveller, the wonder will in great measure cease why it is never quoted by the ancients. Of the nine authors named in p. 109, had any one ever visited Paros? If Pausanias had travelled thither, and published his description of the place, we might perhaps expect to find some mention of this marble in so curious and inquisitive a writer. But though the inscription existed, and were famous at Paros, there seems no necessity for any

Chronicle. any of the authors whose works are still extant to have known or recorded it. If there be, let this learned antagonist point out the place where this mention ought to have been made. If any persons were bound by a stronger obligation than others to speak of the Parian inscription, they must be the professed chronologers; but alas! we have not the entire works of so much as a single ancient chronologer: it is therefore impossible to determine whether this Chronicle were quoted by any ancient. And supposing it had been seen by some ancient, whose writings still remain, why should he make particular mention of it? Many authors, as we know from their remains, very freely copied their predecessors without naming them. Others, finding only a collection of bare events in the inscription, without historical proofs or reasons, might entirely neglect it, as deserving no credit. Mr R. seems to lay much stress on the precise, exact, and particular specification of the events, p. 109. But he ought to reflect, that this abrupt and positive method of speaking is not only usual, but necessary, in such short systems of chronology as the marble contains, where events only, and their dates, are set down, unaccompanied by any examination of evidences for and against, without stating any computation of probabilities, or deduction of reasons. When therefore a chronological writer had undertaken to reduce the general history of Greece into a regular and consistent system, admitting that he was acquainted with this inscription, what grounds have we to believe that he would say any thing about it? Either his system coincided with the Chronicle or not: if it coincided, he would very probably disdain to prop his own opinions with the unsupported assertions of another man, who, as far as he knew, was not better informed than himself. On the other hand, if he differed from the authority of the marble, he might think it a superfluous exertion of complaisance, to refute, by formal demonstration, a writer who had chosen to give no reasons for his own opinion. We shall pass hence to

Objection VII. With respect to the parachronisms that Mr R. produces, we shall without hesitation grant, that the author of the inscription may have committed some mistakes in his chronology, as perhaps concerning Phidon, whom he seems to have confounded with another of the same name, &c. But these mistakes will not conclude against the antiquity of the inscription, unless we at the same time reject many of the principal Greek and Roman writers, who have been convicted of similar errors. We return therefore to

Objection VI. *Some of the facts seem to have been taken from authors of a later date.* We have endeavoured impartially to examine and compare the passages quoted in proof of this objection; but we are obliged to confess, that we do not perceive the faintest traces of theft or imitation. One example only deserves to be excepted; to which we shall therefore pay particular attention.

“The names of six, and, if the lacunæ are properly supplied, the names of twelve cities, appear to have been engraved on the marble, exactly, as we find them in Ælian’s Various History. But there is not any imaginable reason for this particular arrangement. It does not correspond with the time of their foundation, with their situation in Ionia, with their relative impor-

tance, or with the order in which they are placed by Chronicle. other eminent historians.”

The chance of six names, says Mr R. being placed by two authors in the same order, is as 1 to 720; of 12, as 1 to 479,001,600. “It is therefore utterly improbable that these names would have been placed in this order on the marble, if the author of the inscription had not transcribed them from the historian.”

On this argument we shall observe, 1st, That the very contrary conclusion might possibly be just, that the historian transcribed from the inscription. Yet we shall grant that in the present case this is improbable, especially if the author of the Various History be the same Ælian, who, according to Philostratus, Vit. Sophist. II. 31. never quitted Italy in his life. But an intermediate writer might have copied the marble, and Ælian might have been indebted to him. 2dly, We see no reason to allow, that the *lacunæ* are properly supplied. Suppose we should assert, that the names stood originally thus: Miletus, Ephesus, Erythræ, Clazomene, Lebedos, Chios, Phocæa, Colophon, Myus, Priene, Samos, Teos. In this arrangement, only four names would be together in the same order with Ælian; and from these Miletus must be excepted, because there is an obvious reason for mentioning that city first. Three only will then remain; and surely that is too slight a resemblance to be construed into an imitation. For Pausanias and Paterculus, quoted by our author, p. 154, have both enumerated the same twelve cities, and both agree in placing the five last in the same order; nay, the six last, if Vossius’s conjecture that TEUM ought to be inserted in Paterculus after Myus TEM, be as true as it is plausible. But who imagines that Pausanias had either opportunity or inclination to copy Paterculus? 3dly, Allowing that the names were engraved on the marble exactly in the order that Ælian has chosen, is there no way of solving the phenomenon but by supposing that one borrowed from the other? Seven authors at least (Mr R. seems to say more, p. 154, 155.) mention the colonization of the same cities: how many authors now lost may we reasonably conjecture to have done the same? If therefore the composer of the Chronicle and Ælian lighted on the same authors, the former would probably preserve the same arrangement that he found, because in transcribing a list of names, he could have no temptation to deviate; and the latter would certainly adhere faithfully to his original, because he is a notorious and servile plagiarist. Mr R. indeed thinks, p. 158, that if a succeeding writer had borrowed the words of the inscription, he would not have suppressed the name of the author. This opinion must fall to the ground, if it be shown that Ælian was accustomed to suppress the names of the authors to whom he was obliged. Ælian has given a list of fourteen celebrated gluttons; and, elsewhere, another of twenty-eight drunkards (from which, by the way, it appears, that people were apt to eat and drink rather too freely in ancient as well as modern times); and both these lists contain exactly the same names in the same order with Atheneus. Now it is observable, that fourteen names may be transposed 87,178,291,200 different ways, and that twenty-eight names admit of 304,888,344,611,713,860,501,504,000,000 different transpositions, &c. &c. Ælian therefore transcribed

Chronicle. them from Atheneüs: yet Ælian never mentions Atheneüs in his Various History. So that whether Ælian copied from the marble, or only drew from a common source, he might, and very probably would, conceal his authority.

VIII. *The history of the discovery of the Marbles is obscure and unsatisfactory.*

In p. 169, it is said to be "related with suspicious circumstances, and without any of those clear and unequivocal evidences which always discriminate truth from falsehood." The question is then finally decided. If the inscription has not any of those evidences which truth always possesses, and which falsehood always wants, it is most certainly forged. The learned dissertator seems for a moment to have forgotten the modest character of a *doubter*, and to personate the dogmatist. But waving this, we shall add, that, as far as we can see, no appearance of fraud is discoverable in any part of the transaction. The history of many inscriptions is related in a manner equally unsatisfactory; and if it could be clearly proved that the marble was dug up at Paros, what could be easier for a critic, who is determined at any rate to object, than to say, that it was buried there in order to be afterward dug up? If the person who brought this treasure to light had been charged on the spot with forging it, or concurring in the forgery, and had then refused to produce the external evidences of its authenticity, we should have a right to question, or perhaps to deny, that it was genuine. But no such objection having been made or hinted, at the original time of its discovery, it is unreasonable to require such testimony as it is now impossible to obtain. "There is nothing said of it in Sir T. Roe's negotiations." What is the inference? That Sir Thomas knew nothing of it, or believed it to be spurious, or forged it, or was privy to the forgery? Surely nothing of this kind can be pretended. But let our author account for the circumstance if he can. To us it seems of no consequence on either side. "Pieresc made no effort to recover this precious relic; and from this composure he seems to have entertained some secret suspicions of its authenticity." Pieresc would have had no chance of recovering it after it was in the possession of Lord Arundel's agents. He was either a real or a pretended patron of letters; and it became him to affect to be pleased that the inscription had come into England, and was illustrated by his learned friend Selden. John F. Gronovius had, with great labour and expence, collated Anna Comnena's Alexiades, and intended to publish them. While he was waiting for some other collations, they were intercepted, and the work was published by another. As soon as Gronovius heard this unpleasant news, he answered, that learned men were engaged in a common cause; that if one prevented another in any publication, he ought rather to be thanked for lightening the burden, than blamed for interfering. But who would conclude from this answer, that Gronovius thought the Alexiades spurious, or not worthy of any regard?

Mr R. calculates, that the venders of the marble received 200 pieces. But here again we are left in the dark, unless we knew the precise value of these pieces. Perhaps they might be equal to an hundred of our pounds, perhaps only to fifty. Besides, as they at first

Chronicle. bargained with Samson, Pieresc's supposed Jew agent, for fifty pieces only, they could not have forged the inscription with the clear prospect of receiving more; neither does it appear that they were paid by Samson. It is fully as reasonable to suppose fraud on the one side as on the other; and if Samson, after having the marble in his possession, refused or delayed to pay the sum stipulated, he might, in consequence of such refusal or delay, be thrown into prison, and might, in revenge, damage the marble before the owners could recover it. We own this account of ours to be a romance; but it is lawful to combat romance with romance.

IX. *The world has been frequently imposed upon by spurious books and inscriptions; and therefore we should be extremely cautious with regard to what we receive under the venerable name of antiquity.*

Much truth is observable in this remark. But the danger lies in applying such general apophthegms to particular cases. In the first place, it must be observed, that no forged books will exactly suit Mr R.'s purpose, but such as pretend to be the author's own hand-writing; nor any inscriptions, but such as are still extant on the original materials, or such as were known to be extant at the time of their pretended discovery. Let the argument be bounded by these limits, and the number of forgeries will be very much reduced. We are not in possession of Cyriacus Anconitanus's book; but if we were governed by authority, we should think that the testimony of Reinesius in his favour greatly overbalances all that Augustinus has said to his prejudice. The opinion of Reinesius is of the more weight, because he suspects Ursinus of publishing counterfeit monuments. We likewise find the most eminent critics of the present age quoting Cyriacus without suspicion (Vid. Ruhnken. in *Timei Lex. Plat.* p. 10. apud Koen, ad Gregor. p. 140.). The doctrine advanced in the citation from Hardouin is exactly conformable to that writer's usual paradoxes. He wanted to destroy the credit of all the Greek and Latin writers. But inscriptions hung like a millstone about the neck of his project. He therefore resolved to make sure work, and to deny the genuineness of as many as he saw convenient: to effect which purpose, he intrenches himself in a general accusation. If the author of the dissertation had quoted a few more paragraphs from Hardouin, in which he endeavours, after his manner, to show the forgery of some inscriptions, he would at once have administered the poison and the antidote. But to the reveries of that learned madman, respecting Greek supposititious compositions of this nature, we shall content ourselves with opposing the sentiments of a modern critic, whose judgment on the subject of spurious inscriptions will not be disputed. Maffei, in the introduction to the third book, c. 1. p. 51. of his admirable, though unfinished, work, *de Arte Critica Lapidaria*, uses these words: *Inscriptionum Græcæ loquentium commentitias, si cum Latinis comparemus, deprehendi paucas; neque enim ullum omnino est, in tanta debacchantium falsariorum libidine, monumenti genus, in quod ii sibi minus licere putaverint. Argumento est, paucissimas usque in hanc diem ab eruditissimis viris, et in hoc literarum genere plurimum versatis rejectas esse, falsique damnatas.*

Books of CHRONICLES, a canonical writing of the Old

Chronicles, Old Testament. It is uncertain which were written first, *The Books of Kings*, or *The Chronicles*, since they each refer to the other. However it be, the latter is often more full and comprehensive than the former. Whence the Greek interpreters call these two books *Παραλειποmena*, *Supplements*, *Additions*, or things omitted, because they contain some circumstances which are omitted in the other historical books. The Jews make but one book of the Chronicles, under the title of *Dibre-Haiamim*, i. e. *Journals* or *Annals*. Ezra is general believed to be the author of these books. It is certain they were written after the end of the Babylonish captivity and the first year of the reign of Cyrus, of whom mention is made in the last chapter of the second book.

Chronicles,
Chrono-
logy.

the Jewish nation to their first return from the captivity, taken out of those books of the Bible which we still have, and out of other annals which the author had then by him. The design of the writer was to give the Jews a series of their history. The first book relates to the rise and propagation of the people of Israel from Adam, and gives a punctual and exact account of the reign of David. The second book sets down the progress and end of the kingdom of Judah, to the very year of their return from the Babylonish captivity.

Chrono-
gram,
Chrono-
logy.

CHRONOGRAM, a species of false wit, consisting in this, that a certain date or epocha is expressed by numeral letters of one or more verses; such is that which makes the motto of a medal struck by Gustavus Adolphus in 1632:

ChristVs DVX; ergo trIVMphVs.]

C H R O N O L O G Y,

TREATS of time, the method of measuring its parts, and adapting these, when distinguished by proper marks and characters, to past transactions, for the illustration of history. This science therefore consists of two parts. The first treats of the proper measurement of time, and the adjustment of its several divisions; the second, of fixing the dates of the various events recorded in history, and ranging them according to the several divisions of time, in the order in which they happened.

How div-
ided.

Chronolo-
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the an-
cients.

Inaccurate
methods of
computing
time at first
made use
of.

Chronology, comparatively speaking, is but of modern date. The ancient poets appear to have been entirely unacquainted with it; and Homer, the most celebrated of them all, mentions nothing like a formal kalendar in any part of his writings. In the most early periods, the only measurement of time was by the seasons, the revolutions of the sun and moon; and many ages must have elapsed before the mode of computation by dating events came into general use. Several centuries intervened between the era of the Olympic games and the first historians; and several more between these and the first authors of chronology. When time first began to be reckoned, we find its measures very indeterminate. The succession of Juno's priestesses at Argos served Hellanicus for the regulation of his narrative; while Ephorus reckoned his matters by generations. Even in the histories of Herodotus and Thucydides, we find no regular dates for the events recorded: nor was there any attempt to establish a fixed era, until the time of Ptolemy Philadelphus, who attempted it by comparing and correcting the dates of the Olympiads, the kings of Sparta, and the succession of the priestesses of Juno at Argos. Eratosthenes and Apollodorus digested the events recorded by them, according to the succession of the Olympiads and of the Spartan kings.

The uncertainty of the measures of time in the most early periods renders the histories of those times equally uncertain; and even after the invention of dates and eras, we find the ancient historians very inattentive to them, and inaccurate in their computations. Frequently their eras and years were reckoned dif-

ferently without their being sensible of it, or at least without giving the reader any information concerning it; a circumstance which has rendered the fragments of their works now remaining of very little use to posterity. The Chaldean and Egyptian writers are generally acknowledged to be fabulous; and Strabo acquaints us, that Diodorus Siculus, and the other early historians of Greece, were ill informed and credulous. Hence the disagreement among the ancient historians, and the extreme confusion and contradiction we meet with on comparing their works. Hellanicus and Acutylaus disagreed about their genealogies; the latter rejected the traditions of Hesiod. Timæus accused Ephorus of falsehood, and the rest of the world accused Timæus. The most fabulous legends were imposed on the world by Herodotus; and even Thucydides and Diodorus, generally accounted able historians, have been convicted of error. The chronology of the Latins is still more uncertain. The records of the Romans were destroyed by the Gauls; and Fabius Pictor, the most ancient of their historians, was obliged to borrow the greatest part of his information from the Greeks. In other European nations the chronology is still more imperfect and of a later date; and even in modern times, a considerable degree of confusion and inaccuracy has arisen from want of attention in the historians to ascertain the dates and epochs with precision.

Ancient hi-
storians not
to be cre-
dited.

From these observations it is obvious how necessary a proper system of chronology must be for the right understanding of history, and likewise how very difficult it must be to establish such a system. In this, however, several learned men have excelled, particularly Julius Africanus, Eusebius of Cæsarea, George Cyncelle, John of Antioch, Dennis, Petau, Cluvier, Calvisius, Usher, Simson, Marsham, Blair, and Playfair. It is founded, 1. On astronomical observations, particularly of the eclipses of the sun and moon, combined with the calculations of the eras and years of different nations. 2. The testimonies of credible authors. 3. Those epochs in history which are so well attested and determined, that they have never been contro-

Utility of
chronology,
list of chro-
nologists,
&c.

verted. 4. Ancient medals, coins, monuments, and inscriptions. None of these, however, can be sufficiently intelligible without an explanation of the first part, which, we have already observed, considers the divisions of time, and of which therefore we shall treat in the first place.

6
Of the division of time into days.

The most obvious division of time is derived from the apparent revolutions of the celestial bodies, particularly of the sun, which by the vicissitudes of day and night becomes evident to the most barbarous and ignorant nations. In strict propriety of speech, the word *day* signifies only that portion of time during which the sun diffuses light on any part of the earth; but in the most comprehensible sense, it includes the night also, and is called by chronologers a *civil* day; by astronomers a *natural*, and sometimes an *artificial* day.

7
Civil, solar, &c. days defined.

By a civil day is meant the interval betwixt the sun's departure from any given point in the heavens and next return to the same, with as much more as answers to its diurnal motion eastward, which is at the rate of 59 minutes and 8 seconds of a degree, or 3 minutes and 57 seconds of time. It is also called a *solar* day, and is longer than a *sidereal* one, inasmuch that, if the former be divided into 24 equal parts or hours, the latter will consist only of 23 hours 56 minutes. The apparent inequality of the sun's motion, likewise, arising from the obliquity of the ecliptic, produces another inequality in the length of the days: and hence the difference betwixt real and apparent time, so that the apparent motion of the sun cannot always be a true measure of duration. Those inequalities, however, are capable of being reduced to a general standard, which furnishes an exact measure throughout the year; whence arises the difference between mean and apparent time, as is explained under the article *ASTRONOMY*.

8
Different ways of computing the beginning of the day.

There have been very considerable differences among nations with regard to the beginning and ending of their days. The beginning of the day was counted from sunrise by the Babylonians, Syrians, Persians, and Indians. The civil day of the Jews was begun from sunrise, and their sacred one from sunset; the latter mode of computation being followed by the Athenians, Arabs, ancient Gauls and other European nations. According to some, the Egyptians began their day at sunset, while others are of opinion that they computed from noon or from sunrise: and Pliny informs us that they computed their civil day from one midnight to another. It is probable, however, that they had different modes of computation in different provinces or cities. The Ausonians, the most ancient inhabitants of Italy, computed the day from midnight; and the astronomers of Cathay and Oighur in the East Indies reckoned in the same manner. This mode of computation was adopted by Hipparchus, Copernicus, and other astronomers, and is now in common use among ourselves. The *astronomical* day, however, as it is called, on account of its being used in astronomical calculations, commences at noon, and ends at the same time the following day. The Mahometans reckon from one twilight to another. In Italy, the civil day commences at some indeterminate point after sunset; whence the time of noon varies with the season of the year. At the summer solstice, the

9
Strange method of computation in Italy.

clock strikes 16 at noon, and 19 at the time of the winter solstice. Thus also the length of each day differs by several minutes from that immediately preceding or following it. This variation requires a considerable difficulty in adjusting their time by clocks. It is accomplished, however, by a sudden movement which corrects the difference when it amounts to a quarter of an hour; and this it does sometimes at the end of eight days, sometimes at the end of 15, and sometimes at the end of 40. Information of all this is given by a printed kalendar, which announces, that from the 16th of February, for instance to the 24th, it will be noon at a quarter past 18; from the 24th of February to the 6th of March, it will be noon at 18 o'clock precisely; from the first of June to the 13th of July, the hour of noon will be at 16 o'clock; on the 13th of July it will be at half an hour after 16; and so on throughout the different months of the year. This absurd method of measuring the day continues, notwithstanding several attempts to suppress it, throughout the whole of Italy, a few provinces only excepted.

The subdivisions of the day have not been less various than the computations of the day itself. The most obvious division, and which could at no time, nor in no age, be mistaken, was that of morning and evening. In process of time the two intermediate points of noon and midnight were determined; and this division into quarters was in use long before the invention of hours.

10
Various subdivisions of the day.

From this subdivision probably arose the method used by the Jews and Romans of dividing the day and night into four vigils or watches. The first began at sunrise, or six in the morning; the second at nine; the third at twelve; and the fourth at three in the afternoon. In like manner the night was divided into four parts; the first beginning at six in the evening, the second at nine, the third at twelve, and the fourth at three in the morning. The first of these divisions was called by the Jews the *third* hour of the day; the second the *sixth*; the third the *ninth*; and the fourth the *twelfth*, and sometimes the *eleventh*. Another division in use, not only among the nations above mentioned, but the Greeks also, was that which reckoned the first quarter from sunset to midnight; the second from midnight to sunrise; the third, or morning watch, from morning to noon; and the fourth from noon to sunset.

It is uncertain at what time the more minute subdivision of the day into hours first commenced. It does not appear from the writings of Moses that he was acquainted with it, as he mentions only the morning, mid-day, evening, and sunset. Hence we may conclude, that the Egyptians at that time knew nothing of it, as Moses was well skilled in their learning. According to Herodotus, the Greeks received the knowledge of the twelve hours of the day from the Babylonians. It is probable, however, that the division was actually known and in use before the name *hour* was applied to it; as Censorinus informs us that the term was not made use of in Rome for 300 years after its foundation; nor was it known at the time the twelve tables were constructed.

11
Invention of hours uncertain.

The eastern nations divide the day and night in a very singular manner; the origin of which is not easily discovered.

discovered. The Chinese have five watches in the night, which are announced by a certain number of strokes on a bell or drum. They begin by giving one stroke, which is answered by another; and this is repeated at the distance of a minute or two, until the second watch begins, which is announced by two strokes; and so on throughout the rest of the watches. By the ancient Tartars, Indians, and Persians, the day was divided into eight parts, each of which contained seven hours and a half. The Indians on the coast of Malabar divide the day into six parts, called *najika*; each of these six parts is subdivided into 60 others, called *venaigas*; the venaiga into 60 *birpes*; the birpe into 10 *kenikans*; the kenikan into four *mattires*; the mattire into eight *kaunimas* or *caignodes*; which divisions, according to our mode of computation, stand as follow:

12
Method of computation on the coast of Malabar.

Najika, Venaiga, Birpe, Kenikan, Mattire, Caignode.
24 min. 24 sec. 4 sec. $\frac{2}{5}$ sec. $\frac{1}{10}$ sec. $\frac{1}{80}$ sec.

The day of the Chinese is begun at midnight, and ends with the midnight following. It is divided into twelve hours, each distinguished by a particular name and figure. They also divide the natural day into 100 parts, and each of these into 100 minutes; so that the whole contains 10,000 minutes. In the northern parts of Europe, where only two seasons are reckoned in the year, the divisions of the day and night are considerably larger than with us. In Iceland the 24 hours are divided into eight parts; the first of which commences at three in the morning; the second at five; the third at half an hour after eight; the fourth at eleven; the fifth at three in the afternoon; the sixth at six in the evening; the seventh at eight, and the last at midnight. In the eastern part of Turkestan, the day is divided into twelve equal parts, each of which is distinguished by the name of some animal. These are subdivided into eight *keb*; so that the whole 24 hours contain 96 *keb*.

13
Divisions of the hour into minutes, &c.

The modern divisions of the hour in use among us are into minutes, seconds, thirds, fourths, &c. each being a sixtieth part of the former subdivision. By the Chaldeans, Jews, and Arabians, the hour is divided into 1080 scruples; so that one hour contains 60 minutes, and one minute, 18 scruples. The ancient Persians and Arabs were likewise acquainted with this division; but the Jews are so fond of it, that they pretend to have received it in a supernatural manner. "Isaachar (say they) ascended into heaven, and brought from thence 1080 parts for the benefit of the nation."

14
Methods of announcing the hours.

The division of the day being ascertained, it soon became an object to indicate in a public manner the expiration of any particular hour or division; as without some general knowledge of this kind, it would be in a great measure impossible to carry on business. The methods of announcing this have been likewise very different. Among the Egyptians it was customary for the priests to proclaim the hours like watchmen among us. The same method was followed at Rome; nor was there any other method of knowing the hours until the year 293 B. C. when Papirius Cursor first set up a sun-dial in the Capitol. A similar method is practised among the Turks, whose priests proclaim from the top of their mosques, the cock-

crowing, day-break, mid-day, three o'clock in the afternoon, and twilight, being their appointed times of worship.

As this mode of proclaiming the hour could not but be very inconvenient, as well as imperfect, the introduction of an instrument which every one could have in his possession, and which might answer the same purpose, must have been considered as a valuable acquisition. One of the first of these was the clepsydra or water-clock*. Various kinds of these were in use among the Egyptians at a very early period. The invention of the instrument is attributed to Thoth or Mercury, and it was afterwards improved by Ctesibius of Alexandria. It was a common measure of time among the Greeks, Indians, and Chaldeans, as well as the Egyptians, but was not introduced into Rome till the time of Scipio Nasica. The Chinese astronomers have long made use of it; and by its means divided the zodiac into twelve parts; but it is a very inaccurate measure of time, varying, not only according to the quantity of water in the vessel, but according to the state of the atmosphere.

15
Invention of instruments for this purpose.

* See Clepsydra.

The clepsydra was succeeded by the gnomon or sun-dial.—This at first was no more than a stile erected perpendicularly to the horizon; and it was a long time before the principles of it came to be thoroughly understood. The invention is with great probability attributed to the Babylonians, from whom the Jews received it before the time of Ahaz, when we know that a sun-dial was already erected at Jerusalem. The Chinese and Egyptians also were acquainted with the use of the dial at a very early period, and it was considerably improved by Anaximander or Anaximenes; one of whom is for that reason looked upon to be the inventor. Various kinds of dials, however, were invented and made use of in different nations long before their introduction at Rome. The first erected in that city, as has been already mentioned, was that by Papirius Cursor; and 30 years after, Valerius Messala brought one from Sicily, which was used in Rome for no less than 99 years, though constructed for a Sicilian latitude, and consequently incapable of showing the hours exactly in any other place; but at last another was constructed by L. Philippus, capable of measuring time with greater accuracy.

It was long after the invention of dials before mankind began to form any idea of clocks; nor is it well known at what period they were first invented. A clock was sent by Pope Paul I. to Pepin king of France, which at that time was supposed to be the only one in the world. A very curious one was also sent to Charles the Great from the caliph Haroun Al-raschid, which the historians of the time speak of with surprise and admiration: but the greatest improvement was that of Mr Huygens, who added the pendulum to it. Still, however, the instruments for dividing time were found to be inaccurate for nice purposes. The expansion of the materials by heat, and their contraction by cold, would cause a very perceptible alteration in the going of an instrument in the same place at different times of the year, and much more if carried from one climate to another. Various methods have been contrived to correct this; which indeed can be done very effectually at land by a certain construction

I of



of the pendulum; but at sea, where a pendulum cannot be used, the inaccuracy is of consequence much greater: nor was it thought possible to correct the errors arising from these causes in any tolerable degree, until the late invention of Mr Harrison's time-piece, which may be considered as making perhaps as near an approach to perfection as possible.

16
Of weeks.

Having thus given an account of the more minute divisions of time, with the methods of measuring them, we must now proceed to the larger; which more properly belong to chronology, and which must be kept on record, as no instrument can be made to point them out. Of these the division into weeks of seven days is one of the most ancient, and probably took place from the creation of the world. Some, indeed, are of opinion, that the week was invented some time after for the more convenient notation of time; but whatever may be in this, we are certain that it is of the highest antiquity, and even the most rude and barbarous nations have made use of it. It is singular indeed that the Greeks, notwithstanding their learning, should have been ignorant of this division; and M. Goguet informs us, that they were almost the only nation who were so. By them the month of 30 days was divided into three times 10, and the days of it named accordingly. Thus the 15th day of the month was called the *second fifth*, or fifth of the second tenth; the 24th was called the *third fourth*, or the fourth day of the third tenth. This method was in use in the days of Hesiod, and it was not until several ages had elapsed, that the use of weeks was received into Greece from the Egyptians. The inhabitants of Cathay, in the northern part of China, were likewise unacquainted with the week of seven days, but divided the year into six parts of 60 days each. They had also a cycle of 15 days, which they used as a week. The week was likewise unknown to the ancient Persians and to the Mexicans; the former having a different name for every day of the month, and the latter making use of a cycle of 13 days. By almost all other nations the week of seven days was adopted.

17
Of holidays.

It is remarkable, that one day in the week has always been accounted as sacred by every nation. Thus Saturday was consecrated to pious purposes among the Jews, Friday by the Turks, Tuesday by the Africans of Guinea, and Sunday by the Christians. Hence also the origin of *Ferix* or holidays, frequently made use of in Systems of Chronology; and which arose from the following circumstance. In the church of Rome the old ecclesiastical year began with Easter week; all the days of which were called *Ferix* or *Feriaty*, that is, holy, or sacred days; and in process of time the days of other weeks came to be distinguished by the same appellation, for the two following reasons, 1. Because every day ought to be holy in the estimation of a Christian. 2. Because all days are holy to ecclesiastics, whose time ought to be entirely devoted to religious worship.—The term *week* is sometimes used to signify seven years, not only in the prophetic writings, but likewise by profane authors: thus Varro, in his book inscribed *Hebdomades*, informs us, that he had then entered the 12th week of his years.

18
Of months. The next division of time superior to weeks, is that

of *months*. This appears to have been, if not coeval with the creation, at least in use before the flood. As this division is naturally pointed out by the revolution of the moon, the months of all nations were originally lunar; until after some considerable advances had been made in science, the revolutions of that luminary were compared with the sun, and thus the limits of the month fixed with greater accuracy. The division of the year into 12 months, as being founded on the number of full revolutions of the moon in that time, has also been very general; though Sir John Chardin informs us, that the Persians divided the year into 24 months; and the Mexicans into 18 months of 20 days each. The months generally contained 30 days, or 29 and 30 days alternately; though this rule was far from being without exception. The months of the Latins consisted of 16, 18, 22, or 36 days; and Romulus gave his people a year of 10 months and 304 days. The Kamtschatkades divide the year into 10 months; reckoning the time proper for labour to be nine months, and the winter season, when they are obliged to remain inactive, only as one month.

It has been a very ancient custom to give names to the different months of the year, though this appears to have been more modern than the departure of the Israelites out of Egypt, as they would otherwise undoubtedly have carried it with them; but for a considerable time after their settlement in Canaan, they distinguished the months only by the names of first, second, &c. After their return from the Babylonish captivity, they adopted the names given to the months by the Chaldæans. Other nations adopted various names, and arranged the months themselves according to their fancy. From this last circumstance arises the variety in the dates of the months; for as the year was been reckoned from different signs in the ecliptic, neither the number nor the quantity of months have been the same, and their situation has likewise been altered by the intercalations necessary to be made.

These intercalations became necessary on account of the excess of the solar above the lunar year; and the months composed of intercalary days are likewise called *embolismal*. These embolismal months are either *natural* or *civil*. By the former the solar and lunar years are adjusted to one another; and the latter arises from the defect of the civil year itself. The *ador* of the Jews, which always consists of 30 days, is an example of the natural embolismal month.

The Romans had a method of dividing their months into kalends, nones, and ides. The first was derived from an old word *calo*, "to call;" because, at every new moon, one of the lower class of priests assembled the people, and called over, or announced, as many days as intervened betwixt that and the nones, in order to notify the difference of time and the return of festivals. The 2d, 3d, 4th, 5th, 6th, and 7th of March, May, July, and October, were the nones of these months; but in the other months were the 2d, 3d, 4th, and 5th days only. Thus the 5th of January was its nones; the 4th was *pridie nonarum*; the 3d, *tertio nonarum*, &c. The ides contained eight days in every month, and were nine days distant from the nones. Thus the 15th day of the four months already mentioned was the

the ides of them; but in the others the 13th was accounted as such; the 12th was *pridie iduum*, and the 11th *tertio iduum*. The ides were succeeded by the kalends; the 14th of January, for instance, being the 19th kalend of February; the 15th was the 18th kalend; and so on till the 31st of January, which was *pridie kalendarum*; and February 1st was the kalends.

19
Astronomical and civil months.

Among the European nations the month is either astronomical or civil. The former is measured by the motion of the heavenly bodies; the civil consists of a certain number of days specified by the laws, or by the civil institutions of any nation or society. The astronomical months, being for the most part regulated by the motions of the sun and moon, are thus divided into solar and lunar, of which the former is sometimes also called *civil*. The astronomical solar month is the time which the sun takes up in passing through a sign of the ecliptic. The lunar month is periodical, synodical, sidereal, and civil. The synodical lunar month is the time that passes between any conjunction of the moon with the sun and the conjunction following. It includes the motion of the sun eastward during that time; so that a mean lunation consists of 29d. 12h. 44' 2" 8921. The sidereal lunar month is the time of the mean revolution of the moon with regard to the fixed stars. As the equinoctial points go backwards about 4' in the space of a lunar month, the moon must, in consequence of this retrocession, arrive at the equinox sooner than at any fixed star, and consequently the mean sidereal revolution must be longer than the mean periodical one. The latter consists of 27d. 7h. 43' 4" 6840. The civil lunar month is computed from the moon, to answer the ordinary purposes of life; and as it would have been inconvenient, in the computation of lunar months, to have reckoned odd parts of days, they have been composed of 30 days, or of 29 and 30 alternately, as the nearest round numbers. When the month is reckoned from the first appearance of the moon after her conjunction, it is called the *month of illumination*. The Arabs, Turks, and other nations, who use the era of the Hegira, follow this method of computation. As twelve lunar months, however, are 11 days less than a solar year, Julius Cæsar ordained that the month should be reckoned from the course of the sun, and not of the moon; and that they should consist of 30 and 31 days alternately, February only excepted, which was to consist of 28 commonly, and of 29 in leap-years.

20
Of years.

The highest natural division of time is into years. At first, however, it is probable that the course of the sun through the ecliptic would not be observed, but that all nations would measure their time by the revolutions of the moon. We are certain, at least, that the Egyptian year consisted originally of a single lunation; though at length it included two or three months, and was determined by the stated returns of the seasons. As the eastern nations, however, particularly the Egyptians, Chaldeans, and Indians, applied themselves in very early periods to astronomy, they found, by comparing the motions of the sun and moon together, that one revolution of the former included nearly 12 of the latter. Hence a year of 12 lunations was formed, in every one of which were reckoned 30 days; and hence also the division of the ecliptic into 360 degrees. The lunifolar year, consisting of 360 days, was in use

long before any regular intercalations were made; and historians inform us, that the year of all ancient nations was lunifolar. Herodotus relates, that the Egyptians first divided the year into 12 parts by the assistance of the stars, and that every part consisted of 30 days. The Thebans corrected this year by adding five intercalary days to it. The old Chaldean year was also reformed by the Medes and Persians: and some of the Chinese missionaries have informed us, that the lunifolar year was also corrected in China; and that the solar year was ascertained in that country to very considerable exactness. The Latin year, before Numa's correction of it, consisted of 360 days, of which 304 were divided into ten months; to which were added two private months not mentioned in the kalendar.

The imperfection of this method of comparing time is now very evident. The lunifolar year was about 5½ days shorter than the true solar year, and as much longer than the lunar. Hence the months could not long correspond with the seasons; and even in so short a time as 34 years, the winter months would have changed places with those of summer. From this rapid variation, Mr Playfair takes notice, that a passage in Herodotus, by which the learned have been exceedingly puzzled, may receive a satisfactory solution, viz. that "in the time of the ancient Egyptian kings, the sun had twice arisen in the place where it had formerly set, and twice set where it had arisen." By this he supposes it is meant, "that the beginning of the year had twice gone through all the signs of the ecliptic; and that the sun had risen and set twice in every day and month in the year." This, which some have taken for a proof of most extravagant antiquity, he further observes, might have happened in 138 years only; as in that period there would be a difference of nearly two years between the solar and lunar year. Such evident imperfections could not but produce a reformation everywhere; and accordingly we find that there was no nation which did not adopt the method of adding a few intercalary days at certain intervals. We are ignorant, however, of the person who was the first inventor of this method. The Theban priests attributed the invention to Mercury or Thoth; and it is certain that they were acquainted with the year of 365 days at a very early period. The length of the solar year was represented by the celebrated golden circle of Osymandyas of 365 cubits circumference; and on every cubit of which was inscribed a day of the year, together with the heliacal risings and settings of the stars. That monarch is supposed to have reigned in the 11th or 12th century before the Christian era.

21
Explanation of a passage in Herodotus.

The Egyptian solar year being almost six hours shorter than the true one, this inaccuracy, in process of time, produced another revolution; some circumstances attending which serve to fix the date of the discovery of the length of the year, and which, from the above description of the golden circle, we may suppose to have been made during the reign of Osymandyas. The inundation of the Nile was annually announced by the heliacal rising of Sirius, to which the reformers of the kalendar adjusted the beginning of the year, supposing that it would remain immoveable. In a number of years, however, it appeared that their suppositions

12
Great Egyptian year, or annual cycle.

23
Of the
time when
it commen-
ced.

tions of this were ill founded. By reason of the inequality above mentioned, the heliacal rising of Sirius gradually advanced nearly at the rate of one day in four years; so that in 1461 years it completed a revolution, by arising on every succeeding day of the year, and returning to the point originally fixed for the beginning of the year. This period, equal to 1460 Julian years, was termed the *great Egyptian year*, or *canicular cycle*. From the accounts we have of the time that the canicular cycle was renewed, the time of its original commencement may be gathered with tolerable certainty. This happened, according to Censorinus, in the 138th year of the Christian era. Reckoning backward therefore from this time for 1460 years, we come to the year B. C. 1322, when the sun was in Cancer, about 14 or 15 days after the summer solstice, which happened on July 5th. The Egyptians used no intercalation till the time of Augustus, when the corrected Julian year was received at Alexandria by his order; but even this order was obeyed only by the Greeks and Romans who resided in that city; the superstitious natives refusing to make any addition to the length of a year which had been so long established among them.

24
Uncertainty
of the
time when
the true
solar year
was disco-
vered.

We are not informed at what precise period the true year was observed to consist of nearly six hours more than the 365 days. Though the priests of Thebes claim the merit of the discovery, Herodotus makes no mention of it; neither did Thales, who introduced the year of 365 days into Greece, ever use any intercalation. Plato and Eudoxus are said to have obtained it as a secret from the Egyptians about 80 years after Herodotus, and to have carried it into Greece; which showed, that the knowledge of this form of the year was at that time recent, and only known to a few learned men.

25
Years of
the Jews,
&c.

The year of the ancient Jews was lunisolar; and we are informed by tradition, that Abraham preserved in his family, and transmitted to posterity, the Chaldean form of the year, consisting of 360 days; which remained the same without any correction until the date of the Era of Nabonassar. The solar year was adopted among them after their return from the Babylonish captivity; but when subjected to the successors of Alexander in Syria, they were obliged to admit the lunar year into their kalendar. In order to adjust this year to the course of the sun, they added at certain periods a month to Adar, formerly mentioned, and called it *Ve Adar*. They composed also a cycle of 19 years, in seven of which they inserted the intercalary month. This correction was intended to regulate the months in such a manner, as to bring the 15th of Nisan to the equinoctial point; and likewise the courses of the seasons and feasts in such a manner, that the corn might be ripe at the passover as the law required.

26
Reforma-
tion of the
kalendar
by Julius
Cæsar and
Pope Gre-
gory.

We shall not take up the reader's time with any further account of the years made use of by different nations, all of which are resolved at last into the lunisolar; it will be sufficient to mention the improvements in the kalendar made by the two great reformers of it, Julius Cæsar, and Pope Gregory XIII. The institution of the Roman year by Romulus has been already taken notice of; but as this was evidently very imperfect, Numa, on his advancement to the throne,

undertook to reform it. With a design to make a complete lunar year of it, he added 50 days to the 304 of Romulus; and from every one of his months, which consisted of 31 and 30 days, he borrowed one day. Of these additional days he composed two months; calling the one January, and the other February. Various other corrections and adjustments were made; but when Julius Cæsar obtained the sovereignty of Rome, he found that the months had considerably receded from the seasons to which Numa had adjusted them. To bring them forward to their places, he formed a year of 15 months, or 445 days; which, on account of its length, and the design with which it was formed, has been called the *year of confusion*. It terminated on the first of January 45 B. C. and from this period the civil year and months were regulated by the course of the sun. The year of Numa being ten days shorter than the solar year, two days were added by Julius to every one of the months of January, August, and December; and one to April, June, September, and November. He ordained likewise, that an intercalary day should be added every fourth year to the month of February, by reckoning the 24th day, or sixth of the kalends of March, twice over. Hence this year was styled *bissextile*, and also *leap year*, from its leaping a day more than a common year.

The Julian year has been used by modern chronologers, as being a measure of time extremely simple and sufficiently accurate. It is still, however, somewhat imperfect, for as the true solar year consists of 365d. 5h. 48' 45 $\frac{1}{2}$ "', it appears that in 131 years after the Julian correction, the sun must have arrived one day too soon at the equinoctial point. During Cæsar's reign the vernal equinox had been observed by Sotigenes on the 25th of March; but by the time of the Nicene council it had gone backward to the 21st. The cause of the error was not then known; but in 1582, when the equinox happened on the 11th of March, it was thought proper to give the kalendar its last correction. Pope Gregory XIII. having invited to Rome a considerable number of mathematicians and astronomers, employed ten years in the examination of their several formulæ, and at last gave the preference to that of Alofia and Antoninus Lelius, who were brothers. Ten days were now cut off in the month of October, and the 4th of that month was reckoned the 15th. To prevent the seasons from receding in time to come, he ordained that one day should be added every fourth or bissextile year as before; and that the 1600th year of the Christian era, and every fourth century thereafter, should be a bissextile or leap year. One day therefore is to be intercalated in the years 2000, 2400, 2800, &c. but in the other centuries, as 1700, 1800, 1900, 2100, &c. it is to be suppressed, and these are to be reckoned as common years. Even this correction, however, is not absolutely exact; but the error must be very inconsiderable, and scarce amounting to a day and a half in 5000 years.

28
Commence-
ment of the
year.
The commencement of the year has been deter-
mined by the date of some memorable event or occur-
rence, such as the creation of the world, the universal
deluge, a conjunction of planets, the incarnation of
our Saviour, &c. and of course has been referred to
different points in the ecliptic. The Chaldean and
the

the Egyptian years were dated from the autumnal equinox. The ecclesiastical year of the Jews began in the spring; but, in civil affairs, they retained the epoch of the Egyptian year. The ancient Chinese reckoned from the new moon nearest to the middle of Aquarius; but, according to some recent accounts, the beginning of their year was transferred (B. C. 1740.) to the new moon nearest to the winter solstice. This likewise is the date of the Japanese year. Diemschid, or Gem-schid, king of Persia, observed, on the day of his public entry into Persepolis, that the sun entered into Aries. In commemoration of this fortunate event and coincidence, he ordained the beginning of the year to be removed from the autumnal to the vernal equinox. This epoch was denominated *Neuruz*, viz. new-day; and is still celebrated with great pomp and festivity. (See ΕΡΟΣΗΣ.) The ancient Swedish year commenced at the winter solstice, or rather at the time of the sun's appearance in the horizon, after an absence of about 40 days. The feast of this epoch was solemnized on the 20th day after the solstice. Some of the Grecian states computed from the vernal, some from the autumnal equinox, and others from the summer tropic. The year of Romulus commenced in March, and that of Numa in January. The Turks and Arabs date the year from the 16th of July: and the American Indians reckon from the first appearance of the new moon of the vernal equinox. The church of Rome has fixed new year's day on the Sunday that corresponds with the full moon of the same season. The Venetians, Florentines, and Pisans in Italy, and the inhabitants of Treves in Germany, begin the year at the vernal equinox. The ancient clergy reckoned from the 25th of March; and this method was observed in Britain, until the introduction of the new style (A. D. 1752); after which our year commenced on the 1st day of January.

²⁶
Of Cycles.

Besides these natural divisions of time arising immediately from the revolutions of the heavenly bodies, there are others formed from some of the less obvious consequences of these revolutions, which are called *cycles*, from the Greek *κυκλος* a circle. The most remarkable of these are the following.

1. The *cycle of the sun* is a revolution of 28 years, in which time the days of the months return again to the same days of the week; the sun's place to the same signs and degrees of the ecliptic on the same months and days, so as not to differ one degree in 100 years; and the leap-years begin the same course over again with respect to the days of the week on which the days of the months fall. The *cycle of the moon*, commonly called the *golden number*, is a revolution of 19 years; in which time, the conjunctions, oppositions, and other aspects of the moon, are within an hour and a half of being the same as they were on the same days of the months 19 years before. The *indiction* is a revolution of 15 years, used only by the Romans for indicating the times of certain payments made by the subjects to the republic: It was established by Constantine, A. D. 312.

²⁷
Golden number.

²⁸
To find the year of any cycle.

The year of our Saviour's birth, according to the vulgar era, was the 9th year of the solar cycle, the first year of the lunar cycle; and the 312th year after his birth was the first year of the Roman indiction. Therefore, to find the year of the solar cycle, add 9 to

any given year of Christ, and divide the sum by 28, the quotient is the number of cycles elapsed since his birth, and the remainder is the cycle for the given year: If nothing remains, the cycle is 28. To find the lunar cycle, add one to the given year of Christ, and divide the sum by 19; the quotient is the number of cycles elapsed in the interval, and the remainder is the cycle for the given year: If nothing remains the cycle is 19. Lastly, subtract 312 from the given year of Christ, and divide the remainder by 15; and what remains after this division is the indiction for the given year: If nothing remains, the indiction is 15.

Although the above deficiency in the lunar circle of an hour and an half every 19 years be but small, yet in time it becomes so sensible as to make a whole natural day in 310 years. So that, although the cycle be of use, when the golden numbers are rightly placed against the days of the month in the kalendar, as in the Common Prayer Books, for finding the days of the mean conjunctions or oppositions of the sun and moon, and consequently the time of Easter; it will only serve for 310 years, old style. For as the new and full moons anticipate a day in that time, the golden numbers ought to be placed one day earlier in the kalendar for the next 310 years to come. These numbers were rightly placed against the days of new moon in the kalendar, by the council of Nice, A. D. 325; but the anticipation, which has been neglected ever since, is now grown almost into five days: And therefore all the golden numbers ought now to be placed five days higher in the kalendar for the old style, than they were at the time of the said council; or six days lower for the new style, because at present it differs 11 days from the old.

²⁹
Variation of the golden numbers.

In the first of the following tables, the golden numbers under the months stand against the days of new moon in the left-hand column, for the new style; adapted chiefly to the second year after leap-year, as being the nearest mean for all the four; and will serve till the year 1900. Therefore, to find the day of new moon in any month of a given year till that time, look for the golden number of that year under the desired month, and against it you have the day of new moon in the left-hand column. Thus, suppose it were required to find the day of new moon in September 1789; the golden number for that year is 4, which I look for under September, and right against it, in the left-hand column, you will find 19, which is the day of new moon in that month. *N. B.* If all the golden numbers, except 17 and 6, were set one day lower in the table, it would serve from the beginning of the year 1900 till the end of the year 2199. The table at the end of this section shows the golden number for 4000 years after the birth of Christ, by looking for the even hundreds of any given year at the left hand, and for the rest to make up that year at the head of the table; and where the columns meet, you have the golden number (which is the same both in old and new style) for the given year. Thus, suppose the golden number was wanted for the year 1789; look for 1700 at the left hand of the table, and for 89 at the top of it: then guiding your eye downward from 89 to overagainst 1700, you will find 4, which is the golden number for that year.

³⁰
To find the golden number.

But because the lunar cycle of 19 years sometimes includes five leap-years, and at other times only four,

this table will sometimes vary a day from the truth in leap-years after February. And it is impossible to have one more correct, unless we extend it to four times 19 or 76 years; in which there are 19 leap-years without a remainder. But even then to have it of perpetual use, it must be adapted to the old style; because, in every centennial year not divisible by 4, the regular course of leap-years is interrupted in the new; as was the case in the year 1800.

³¹
Dionysian
period, or
cycle of
Easter.

2. The cycle of *Easter*, also called the *Dionysian period*, is a revolution of 532 years, found by multiplying the solar cycle 28 by the lunar cycle 19. If the new moons did not anticipate upon this cycle, Easter-day would always be the Sunday next after the first full moon which follows the 21st of March. But, on account of the above anticipation, to which no proper regard was had before the late alteration of the style, the ecclesiastical Easter has several times been a week different from the true Easter within this last century: which inconvenience is now remedied by making the table, which used to find Easter for ever, in the Common Prayer Book, of no longer use than the lunar difference from the new style will admit of.

The earliest Easter possible is the 22d of March, the latest the 25th of April. Within these limits are 35 days, and the number belonging to each of them is called the *number of direction*; because thereby the time of Easter is found for any given year.

³²
Dominical
letter.

The first seven letters of the alphabet are commonly placed in the annual almanacks, to show on what days of the week the days of the months fall throughout the year. And because one of those seven letters must necessarily stand against Sunday, it is printed in a capital form, and called the *dominical letter*; the other six being inserted in small characters, to denote the other six days of the week. Now, since a common Julian year contains 365 days, if this number be divided by 7 (the number of days in a week) there will remain one day. If there had been no remainder, it is plain the year would constantly begin on the same day of the week: but since one remains, it is plain that the year must begin and end on the same day of the week; and therefore the next year will begin on the day following. Hence, when January begins on Sunday, A is the dominical or Sunday letter for that year: Then, because the next year begins on Monday, the Sunday will fall on the seventh day, to which is annexed the seventh letter G, which therefore will be the dominical letter for all that year: and as the third year will begin on Tuesday, the Sunday will fall on the sixth day; therefore F will be the Sunday letter for that year. Whence it is evident, that the Sunday letters will go annually in a retrograde order thus, G, F, E, D, C, B, A. And, in the course of seven years, if they were all common ones, the same days of the week and dominical letters would return to the same days of the months. But because there are 366 days in a leap-year, if this number be divided by 7, there will remain two days over

and above the 52 weeks of which the year consists. And therefore, if the leap-year begins on Sunday, it will end on Monday; and the next year will begin on Tuesday, the first Sunday whereof must fall on the sixth of January, to which is annexed the letter F, and not G, as in common years. By this means, the leap-year returning every fourth year, the order of the dominical letters is interrupted; and the series cannot return to its first state till after four times seven, or 28 years; and then the same days of the months return in order to the same days of the week as before.

TABLE I.

Days.	Jan.	Feb.	March	April	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
1	9		9	17	17	6				11		19
2		17			6	14	14	3	11		19	8
3	17	6	17	6			3	11		19	8	
4	6		6	14	14	3			19	8		16
5		14			3	11	11	19	8		16	
6	14	3	14	3			19			16	5	5
7	3		3	11	11	19		8	16	5	13	
8		11			19	8	8	16	5	5	13	
9	11	19	11	19						13		2
10			19	8	8	16	16	5	13		2	10
11	19	8					5	13	2	2	10	
12	8	16	8	16	16	5				10		18
13					5	13	13	2	10	18	18	7
14	16	5	16	5					2	10	18	7
15	5			13	13	2					7	15
16		13			2	10	10	18	7			15
17	13	2	13	2			18	7		15	4	4
18	2		2	10	10	18			15			12
19		10			18	7	7	15	4	4	12	
20	10	18	10	18			15			12	1	1
21	18		18	7	7	15		4	12			9
22		7			15	4	4	12	1	1	9	
23	7	15	7	15			12				9	17
24			15	4	4	12		1	9			6
25	15	4			12			1	9	17	17	6
26	4		4	12		1					6	15
27		12		1	1	9	9	17	6		14	
28	12	1	12		9		17	6	14	14	3	3
29	1		1	9		17				3		11
30					17	6	6	14	3			
31	9		9				14	3		11		19

TABLE

TABLE II.

TABLE, showing the Golden Number, (which is the same both in the Old and New Style), from the Christian Era, to A. D. 4000.

Hundreds of Years.	Years less than a hundred.																				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56		
	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75		
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94		
	95	96	97	98	99																
0	1900	3800	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
100	2000	3900	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5
200	2100	4000	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10
300	2200	&c.	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
400	2300	—	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1
500	2400	—	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6
600	2500	—	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11
700	2600	—	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
800	2700	—	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2
900	2800	—	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7
1000	2900	—	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12
1100	3000	—	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1200	3100	—	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3
1300	3200	—	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8
1400	3300	—	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13
1500	3400	—	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1600	3500	—	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4
1700	3600	—	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9
1800	3700	—	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14

55 Julian period.

From the multiplication of the solar cycle of 28 years into the lunar cycle of 19 years, and the Roman indiction of 15 years, arises the great Julian period, consisting of 7980 years, which had its beginning 764 years before Strauchius's supposed year of the creation (for no later could all the three cycles begin together), and it is not yet completed: And therefore it includes all other cycles, periods, and eras. There is but one year in the whole period that has the same numbers for the three cycles of which it is made up: And therefore, if historians had remarked in their writings the cycles of each year, there had been no dispute about the time of any action recorded by them.

34 To find the year of the Julian period.

The Dionysian or vulgar era of Christ's birth was about the end of the year of the Julian period 4713; and consequently the first year of his age, according to that account, was the 4714th year of the said period. Therefore, if to the current year of Christ we add 4713, the sum will be the year of the Julian period. So the year 1789 will be found to be the 6502d year of that period. Or, to find the year of the Julian period answering to any given year before the first year of Christ, subtract the number of that given year from 4714, and the remainder will be the year of the Julian period. Thus, the year 585 before the first year of Christ (which was the 584th before his birth) was the

4129th year of the said period. Lastly, to find the cycles of the sun, moon, and indiction for any given year of this period, divide the given year by 28, 19, and 15; the three remainders will be the cycles sought, and the quotients the number of cycles run since the beginning of the period. So in the above 4714th year of the Julian period, the cycle of the sun was 10, the cycle of the moon 2, and the cycle of indiction 4; the solar cycle having run through 168 courses, the lunar 248, and the indiction 314.

The vulgar era of Christ's birth was never settled till the year 527, when Dionysius Exiguus, a Roman abbot, fixed it to the end of the 4713th year of the Julian period, which was four years too late; for our Saviour was born before the death of Herod, who sought to kill him as soon as he heard of his birth. And according to the testimony of Josephus (*B. xvii. ch. 8.*), there was an eclipse of the moon in the time of Herod's last illness; which eclipse appears by our astronomical tables to have been in the year of the Julian period 4710, March 13. at 3 hours past mid-night, at Jerusalem. Now, as our Saviour must have been born some months before Herod's death, since in the interval he was carried into Egypt, the latest time in which we can fix the true era of his birth is about the end of the 4709th year of the Julian period.

35 Year of Christ's birth when settled.

³⁶
Eras or Epochs.

As there are certain fixed points in the heavens from which astronomers begin their computations, so there are certain points of time from which historians begin to reckon; and these points or roots of time are called *eras* or *epochs*. The most remarkable eras are, those of the Creation, the Greek Olympiads, the building of Rome, the era of Nabonassar, the death of Alexander, the birth of Christ, the Arabian Hegira, and the Persian Jesdegird: All which, together with several others of less note, have their beginnings fixed by chronologers to the years of the Julian period, to the age of the world at those times, and to the years before and after the year of Christ's birth.

³⁷
Historic chronology.

HAVING thus treated as fully as our limits will admit, of the various divisions of time, we must now consider the second part of chronology, viz. that which more immediately relates to history, and which has already been observed to have the four following foundations: 1. Astronomical observations, particularly of eclipses. 2. The testimonies of credible authors. 3. Epochs in history universally allowed to be true. 4. Ancient medals, coins, monuments, and inscriptions. We shall consider these four principal parts in the order they here stand.

³⁸
Of eclipses of the sun and moon.

I. It is with great reason that the eclipses of the sun and moon, and the aspects of the other planets, have been called public and celestial characters of the times, as their calculations afford chronologers infallible proofs of the precise epochs in which a great number of the most signal events in history have occurred. So that in chronological matters we cannot make any great progress, if we are ignorant of the use of astronomic tables, and the calculation of eclipses. The ancients regarded the latter as prognostics of the fall of empires, of the loss of battles, of the death of monarchs, &c. And it is to this superstition, to this wretched ignorance, that we happily owe the vast labour that historians have taken to record so great a number of them. The most able chronologers have collected them with still greater labour. Calvisius, for example, founds his chronology on 144 eclipses of the sun, and 127 of the moon, that he says he had calculated. The grand conjunction of the two superior planets, Saturn and Jupiter, which, according to Kepler, occurs once in 800 years in the same point of the zodiac, and which has happened only eight times since the creation (the last time in the month of December 1603), may also furnish chronology with incontestable proofs. The same may be said of the transit of Venus over the sun, which has been observed in our days, and all the other uncommon positions of the planets. But among these celestial and natural characters of times, there are also some that are named *civil* or *artificial*, and which, nevertheless, depend on astronomic calculation.

Such are the solar and lunar cycles; the Roman indiction; the feast of Easter; the bissextile year; the jubilees; the sabbatic years; the combats and Olympic games of the Greeks, and Hegira of the Mahometans, &c. And to these may be added the periods, eras, epochs, and years of different nations, ancient and modern. We shall only remark on this occasion, that the period or era of the Jews commences with

the creation of the world; that of the ancient Romans with the foundation of the city of Rome; that of the Greeks at the establishment of the Olympic games; that of Nabonassar, with the advancement of the first king of Babylon to the throne; the Yezdegerdic years, with the last king of the Persians of that name; the Hegira of the Turks, with the flight of Mahomet from Mecca to Medina, &c. The year of the birth of Christ was the 4713th year of the Julian period, according to the common method of reckoning. Astronomical chronology teaches us to calculate the precise year of the Julian period in which each of these epochs happened.

II. The testimony of authors is the second principal part of historic chronology. Though no man whatever has a right to pretend to infallibility, or to be regarded as a sacred oracle, it would, however, be making a very unjust judgment of mankind, to treat them all as dupes or impostors; and it would be an injury offered to public integrity, were we to doubt the veracity of authors universally esteemed, and of facts that are in themselves highly worthy of belief. It would be even a kind of insatiation to doubt that there have been such cities as Athens, Sparta, Rome, Carthage, &c. or that Xerxes reigned in Persia, and Augustus in Rome: whether Hannibal ever was in Italy; or that the emperor Constantine built Constantinople, &c. The unanimous testimony of the most respectable historians will not admit any doubt of these matters. When an historian is allowed to be completely able to judge of an event, and to have no intent of deceiving by his relation, his testimony is unexceptionable. But to avoid the danger of adopting error for truth, and to be satisfied of a fact that appears doubtful in history, we may make use of the four following rules, as they are founded in reason.

1. We ought to pay a particular regard to the testimonies of those who wrote at the same time the events happened, and who have not been contradicted by any cotemporary author of known authority. Who can doubt, for example, of the truth of the facts related by Admiral Anson, in the history of his voyage round the world? The admiral saw all the facts there mentioned with his own eyes, and published his book when two hundred companions of his voyage were still living in London, and could have contradicted him immediately, if he had given any false or exaggerated relations.

2. After the cotemporary authors, we should give more credit to those who lived near the time the events happened than those who lived at a distance.

3. Those doubtful histories, which are related by authors that are but little known, can have no weight, if they are at variance with reason, or established tradition.

4. We must distrust the truth of a history that is related by modern authors, when they do not agree among themselves in several circumstances, nor with ancient historians, who are to be regarded as original sources. We should especially doubt the truth of those brilliant portraits, that are drawn at pleasure by such as never knew the persons they are intended for, and even made several centuries after their decease.

The

The most pure and most fruitful source of ancient history is doubtless to be found in the Holy Bible. Let us here for a moment cease to regard it as divine, and let us presume to consider it as a common history. Now, when we regard the writers of the books of the Old Testament, and consider them sometimes as authors, sometimes as ocular witnesses, and sometimes as respectable historians: whether we reflect on the simplicity of the narration, and the air of truth that is there constantly visible; or, when we consider the care that the people, the governments, and the learned men of all ages, have taken to preserve the true text of the Bible; or that we have regard to the happy conformity of the chronology of the holy scriptures with that of profane history: or, if we observe the admirable harmony that is between these books and the most respectable historians, as Josephus and others: and lastly, when we consider that the books of the holy scripture furnish us alone with an accurate history of the world from the creation, through the line of patriarchs, judges, kings, and princes of the Hebrews; and that we may, by its aid, form an almost entire series of events down to the birth of Christ, or the time of Augustus, which comprehends a space of about 4000 years, some small interruptions excepted, and which are easily supplied by profane history; when all these reflections are justly made, we must constantly allow that the scriptures form a book which merits the first rank among all the sources of ancient history. It has been objected, that this book contains contradictions; but the most able interpreters have reconciled these seeming contradictions. It has been said, that the chronology of the Hebrew text and the Vulgate do not agree with the chronology of the version of the Septuagint; but the soundest critics have shown that they may be made to agree. It has been observed, moreover, that the Scriptures abound with miracles and prodigies; but they are miracles that have really happened: and what ancient history is there that is not filled with miracles, and other marvellous events? And do we for that reject their authority? Cannot the true God be supposed to have performed those miracles which Pagan historians have attributed to their false divinities? Must we pay no regard to the writings of Livy, because his history contains many fabulous relations?

40
Epochs.

III. The *epochs* form the third principal part of chronology. These are those fixed points in history that have never been contested, and of which there can, in fact, be no doubt. Chronologers fix on the events that are to serve as epochs, in a manner quite arbitrary; but this is of little consequence, provided the dates of these epochs agree, and that there is no contradiction in the facts themselves. When we come to treat expressly on history, we shall mention, in our progress, all the principal epochs.

41
Medals,
&c.

IV. Medals, monuments, and inscriptions, form the fourth and last principal part of chronology. It is scarce more than 150 years since close application has been made to the study of these; and we owe to the celebrated Spanheim the greatest obligations, for the progress that is made in this method: his excellent work, *De præstantia et usu numismatum antiquorum*, has shown the great advantages of it; and it is evident that these

monuments are the most authentic witnesses that can be produced. It is by the aid of medals that M. Vaillant has composed his judicious history of the kings of Syria, from the time of Alexander the Great to that of Pompey: they have been, moreover, of the greatest service in elucidating all ancient history, especially that of the Romans; and even sometimes that of the middle age. Their use is more fully spoken of in the article *MEDALS*. What we here say of medals, is to be understood equally, in its full force, of ancient inscriptions, and of all other authentic monuments that have come down to us.

Every reader, endowed with a just discernment, will readily allow that these four parts of chronology afford clear lights, and are excellent guides, to conduct us through the thick darkness of antiquity. That impartiality, however, which directs us to give a faithful relation of that which is true and false, of the certainty and uncertainty of all the sciences, obliges us here freely to confess, that these guides are not infallible, nor the proofs that they afford mathematical demonstrations. In fact, with regard to history in general, and ancient history in particular, something must be always left to conjecture and historic faith. It would be an offence against common probity, were we to suffer ourselves to pass over in silence those objections which authors of the greatest reputation have made against the certainty of chronology. We shall extract them from their own works; and we hope that there is no magistrate, theologian, or public professor in Europe, who would be mean enough to accuse us of a crime, for not unworthily disguising the truth.

1. The prodigious difference there is between the Septuagint Bible and the Vulgate, in point of chronology, occasions an embarrassment, which is the more difficult to avoid, as we cannot positively say on which side the error lies. The Greek Bible counts, for example, from the creation of the world to the birth of Abraham, 1500 years more than the Hebrew and Latin Bibles, &c. 2. How difficult is it to ascertain the years of the Judges of the Jewish nation, in the Bible? What darkness is spread over the succession of the kings of Judah and Israel? The calculation of time is there so inaccurate, that the Scripture never marks if they are current or complete years. For we cannot suppose that a patriarch, judge, or king, lived exactly 60, 90, 100, or 969 years, without any odd months or days. 3. The different names that the Assyrians, Egyptians, Persians, and Greeks, have given to the same prince, have contributed not a little to embarrass all ancient chronology. Three or four princes have borne the name of Assuerus, though they had also other names. If we did not know that Nabucodonosor, Nabucodrosor, and Nabucolassar, were the same name, or the name of the same man, we should scarcely believe it. Sargon is Sennacherib; Ozias is Azarias; Sedecias is Mathanias; Joachas is also called Sellum; Asaraddon, which is pronounced indifferently Efarhaddon and Asarhaddon, is called Asenaphar by the Cuthæans; and by an oddity of which we do not know the origin, Sardanapalus is called by the Greeks Tenos Concoleros. 4. There remain to us but few monuments of the first monarchs of the

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the world. Numberless books have been lost, and those which have come down to us are mutilated or altered by transcribers. The Greeks began to write very late. Herodotus, their first historian, was of a credulous disposition, and believed all the fables that were related by the Egyptian priests. The Greeks were in general vain, partial, and held no nation in esteem but their own. The Romans were still more infatuated with notions of their own merit and grandeur: their historians were altogether as unjust as was their senate, toward other nations that were frequently far more respectable. 5. The eras, the years, the periods, and epochs, were not the same in each nation; and they, moreover, began at different seasons of the year. All this has thrown so much obscurity over chronology, that it appears to be beyond all human capacity totally to disperse it.

Christianity itself had subsisted near 1200 years, before they knew precisely how many years had passed since the birth of our Saviour. They saw clearly that the vulgar era was defective, but it was a long time before they could comprehend that it required four whole years to make up the true period. Abbé Denis the Little, who in the year 532 was the first among the Christians to form the era of that grand epoch, and to count the years from that time, in order to make their chronology altogether Christian, erred in his calculation, and led all Europe into his error. They count 132 contrary opinions of different authors concerning the year in which the Messiah appeared on the earth. M. Vallemont names 64 of them, and all celebrated writers. Among all these authors, however, there is none that reckon more than 7000, nor less than 3700 years. But even this difference is enormous. The most moderate fix the birth of Christ in the 4000th year of the world. The reasons, however, on which they found their opinion, appear to be sufficiently arbitrary.

Be these matters, however, as they may, the wisdom of Providence has so disposed all things, that there remain sufficient lights to enable us nearly to connect the series of events: for in the first 3000 years of the world, where profane history is defective, we have the chronology of the Bible to direct us; and after that period, where we find more obscurity in the chronology of the Holy Scriptures, we have, on the other hand, greater lights from profane authors. It is at this period that begins the time which Varro calls *historic*: as, since the time of the Olympiads, the truth of such events as have happened shines clear in history. Chronology, therefore, draws its principal lights from history; and, in return, serves it as a guide. Referring the reader, therefore, to the article HISTORY, and the *Chart* thereto annexed, we shall conclude the present article with

A CHRONOLOGICAL TABLE of Remarkable Events, Discoveries, and Inventions, from the Creation to the year 1804.

Before Christ.

- 4008 The creation of the world and Adam and Eve.
- 4007 The birth of Cain, the first who was born of a woman.
- 3017 Enoch, for his piety, is translated to heaven.

- 2352 The old world is destroyed by a deluge which continued 377 days.
- 2247 The tower of Babel is built about this time by Noah's posterity, upon which God miraculously confounds their language, and thus disperses them into different nations.
- 2207 About this time, Noah is, with great probability, supposed to have parted from his rebellious offspring, and to have led a colony of some of the more tractable into the east, and there either he or one of his successors to have founded the ancient Chinese monarchy.
- 2234 The celestial observations are begun at Babylon, the city which first gave birth to learning and the sciences.
- 2188 Misraim, the son of Ham, founds the kingdom of Egypt, which lasted 1663 years, down to the conquest of Cambyfes, in 525 before Christ.
- 2059 Ninus, the son of Belus, founds the kingdom of Assyria, which lasted above 1000 years, and out of its ruins were formed the Assyrians of Babylon, those of Nineveh, and the kingdom of the Medes.
- 1985 The covenant of God made with Abram, when he leaves Haran to go into Canaan, which begins the 430 years of sojourning.
- 1961 The cities of Sodom and Gomorra are destroyed for their wickedness by fire from heaven.
- 1856 The kingdom of Argos, in Greece, begins under Inachus.
- 1822 Memnon, the Egyptian, invents the letters.
- 1715 Prometheus first struck fire from flints.
- 1635 Joseph dies in Egypt.
- 1574 Aaron born in Egypt; 1490, appointed by God first high-priest of the Israelites.
- 1571 Moses, brother to Aaron, born in Egypt, and adopted by Pharaoh's daughter, who educates him in all the learning of the Egyptians.
- 1556 Cecrops brings a colony of Saites from Egypt into Attica, and begins the kingdom of Athens in Greece.
- 1555 Moses performs a number of miracles in Egypt, and departs from that kingdom, together with 600,000 Israelites, besides children, which completed the 430 years of sojourning. They miraculously pass through the Red Sea, and come to the desert of Sinai, [where Moses receives from God, and delivers to the people, the Ten Commandments, and the other laws, and sets up the tabernacle, and in it the ark of the covenant.
- 1546 Scamander comes from Crete into Phrygia, and begins the kingdom of Troy.
- 1515 The Israelites, after sojourning in the Wilderness forty years, are led under Joshua into the land of Canaan, where they fix themselves, after having subdued the natives; and the period of the sabbatical year commences.
- 1503 The deluge of Deucalion.
- 1496 The council of Amphictyons established at Thermopylae.
- 1493 Cadmus carried the Phenician letters into Greece, and built the citadel of Thebes.
- 1490 Sparta built by Lacedemon.

Before Christ.

C H R O N O L O G Y.

III

Before
Christ.

Before
Christ.

- 1485 The first ship that appeared in Greece was brought from Egypt by Danaus, who arrived at Rhodes, and brought with him his fifty daughters.
- 1480 Troy built by Dardanus.
- 1452 The Pentateuch, or five first books of Moses, are written in the land of Moab, where he died the year following, aged 110.
- 1406 Iron is found in Greece, from the accidental burning of the woods.
- 1344 The kingdom of Mycenæ begins.
- 1326 The Isthmian games instituted at Corinth.
- 1325 The Egyptian canicular year began July 20th.
- 1307 The Olympic games instituted by Pelops.
- 1300 The Lupercalia instituted.
- 1294 The first colony came from Italy to Sicily.
- 1264 The second colony came from Italy into Sicily.
- 1252 The city of Tyre built.
- 1243 A colony of Arcadians conducted by Evander into Italy.
- 1233 Carthage founded by the Tyrians.
- 1225 The Argonautic expedition.
- 1204 The rape of Helen by Paris, which gave rise to the Trojan war, ending with the destruction of the city in 1184.
- 1176 Salamis in Cyprus built by Teucer.
- 1152 Ascanius builds Alba Longa.
- 1130 The kingdom of Sicyon ended.
- 1124 Thebes built by the Bœotians.
- 1115 The mariner's compass known in China.
- 1104 The expedition of the Heraclidæ into Peloponnesus; the migration of the Dorians thither; and the end of the kingdom of Mycenæ.
- 1102 The kingdom of Sparta commenced.
- 1070 The kingdom of Athens ended.
- 1051 David besieged and took Jerusalem.
- 1044 Migration of the Ionian colonies.
- 1008 The Temple is solemnly dedicated by Solomon.
- 996 Solomon prepared a fleet on the Red Sea to send to Ophir.
- 986 Samos and Utica in Africa built.
- 979 The kingdom of Israel divided.
- 974 Jerusalem taken and plundered by Shishak king of Egypt.
- 911 The prophet Elijah flourished.
- 894 Money first made of gold and silver at Argos.
- 884 Olympic games restored by Iphitus and Lycurgus.
- 873 The art of sculpture in marble found out.
- 869 Scales and measures invented by Phidon.
- 864 The city of Carthage, in Africa, enlarged by Queen Dido.
- 821 Nineveh taken by Arbaces.
- 814 The kingdom of Macedon begins.
- 801 The city of Capua in Campania built.
- 799 The kingdom of Lydia began.
- 786 The ships called *Triremes* invented by the Corinthians.
- 779 The race of kings in Corinth ended.
- 776 The era of the Olympiads began.
- 760 The Ephori established at Sparta.
- 758 Syracuse built by Archias of Corinth.
- 754 The government of Athens changed.
- 753 Era of the building of Rome in Italy by Romulus, first king of the Romans.
- 747 The era of Nabonassar commenced on the 26th of February; the first day of Thoth.
- 746 The government of Corinth changed into a republic.
- 743 The first war between the Messenians and Spartans.
- 742 Mycenæ reduced by the Spartans.
- 724 A colony of the Messenians settled at Rhegium in Italy.
- 720 Samaria taken, after three years siege, and the kingdom of Israel finished by Salmanazer king of Assyria, who carries the ten tribes into captivity.
- The first eclipse of the moon on record,
- 713 Gela in Sicily built.
- 703 Corcyra, now Corfu, founded by the Corinthians.
- 702 Ecbatan in Media built by Deioces.
- 685 The second Messenian war under Aristomenes.
- 670 Byzantium (now Constantinople) built by a colony of Athenians.
- 666 The city of Alba destroyed.
- 648 Cyrene in Africa founded.
- 634 Cyaxares besieges Nineveh, but is obliged to raise the siege by an incursion of the Scythians, who remained masters of Asia for 28 years.
- 624 Draco published his inhuman laws at Athens.
- 610 Pharaoh Necho attempted to make a canal from the Nile to the Red Sea, but was not able to accomplish it.
- 607 By order of the same monarch, some Phenicians sailed from the Red Sea round Africa, and returned by the Mediterranean.
- 606 The first captivity of the Jews by Nebuchadnezzar. Nineveh destroyed by Cyaxares.
- 600 Thales, of Miletus, travels into Egypt, consults the priests of Memphis, acquires the knowledge of geometry, astronomy, and philosophy; returns to Greece, calculates eclipses, gives general notions of the universe, and maintains that an only Supreme Intelligence regulates all its motions.
- Maps, globes, and the signs of the zodiac, invented by Anaximander, the scholar of Thales.
- 598 Jehoiakin, king of Judah, is carried away captive, by Nebuchadnezzar, to Babylon.
- 594 Solon made Archon at Athens.
- 591 The Pythian games instituted in Greece, and tragedy first acted.
- 588 The first irruption of the Gauls into Italy.
- 586 The city of Jerusalem taken after a siege of 18 months.
- 582 The last captivity of the Jews by Nebuchadnezzar.
- 581 The Isthmian games restored.
- 580 Money first coined at Rome.
- 571 Tyre taken by Nebuchadnezzar after a siege of 13 years.
- 566 The first census at Rome, when the number of citizens was found to be 84,000.
- 562 The first comedy at Athens acted upon a moveable scaffold.
- 559 Cyrus the first king of Persia.
- 538 The kingdom of Babylon finished; that city being

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- ing taken by Cyrus, who, in 536, gives an edict for the return of the Jews.
- 534 The foundation of the temple laid by the Jews.
- 526 Learning is greatly encouraged at Athens, and a public library first founded.
- 520 The second edict to rebuild Jerusalem.
- 515 The second temple at Jerusalem is finished under Darius.
- 510 Hippias banished from Athens.
- 509 Tarquin, the seventh and last king of the Romans, is expelled, and Rome is governed by two consuls, and other republican magistrates, till the battle of Pharsalia, being a space of 461 years.
- 508 The first alliance between the Romans and Carthaginians.
- 507 The second census at Rome, 130,000 citizens.
- 504 Sardis taken and burnt by the Athenians, which gave occasion to the Persian invasion of Greece.
- 498 The first dictator appointed at Rome.
- 497 The Saturnalia instituted at Rome.
The number of citizens 150,700.
- 493 Tribunes created at Rome; or, in 488.
- 490 The battle of Marathon, September 28.
- 486 Æschylus, the Greek poet, first gains the prize of tragedy.
- 483 Questors created at Rome.
- 481 Xerxes, king of Persia, begins his expedition against Greece.
- 480 The defence of Thermopylæ by Leonidas, and the sea-fight at Salamis.
- 476 The number of Roman citizens reduced to 103,000.
- 469 The third Messenian war.
- 466 The number of Roman citizens increased to 124,214.
- 458 Ezra is sent from Babylon to Jerusalem, with the captive Jews and the vessels of gold and silver, &c. being seventy weeks of years, or 490 years, before the crucifixion of our Saviour.
- 456 The Ludi Seculares first celebrated at Rome.
- 454 The Romans send to Athens for Solon's laws.
- 451 The Decemvirs created at Rome, and the laws of the twelve tables compiled and ratified.
- 449 The Decemvirs banished.
- 445 Military tribunes, with consular power, created at Rome.
- 443 Censors created at Rome.
- 441 The battering ram invented by Artemones.
- 432 The Metonic cycle began July 15th.
- 431 The Peloponnesian war began, and lasted 27 years.
- 430 The history of the Old Testament finishes about this time.
A plague over all the known world.
Malachi the last of the prophets.
- 405 The Athenians entirely defeated by Lyfander, which occasions the loss of the city, and ruin of the Athenian power.
- 401 The retreat of the 10,000 Greeks under Xenophon. The 30 tyrants expelled from Athens, and democratic government restored.
- 400 Socrates, the founder of moral philosophy among the Greeks, believes the immortality of the soul, a state of rewards and punishments; for which

- and other sublime doctrines, he is put to death by the Athenians, who soon after repent, and erect to his memory a statue of brass.
- 399 The feast of Læstifernium instituted. Catapultæ invented by Dionysius.
- 394 The Corinthian war begun.
- 390 Rome burnt by the Gauls.
- 387 The peace of Antalcidas between the Greeks and Persians.
The number of Roman citizens amounted to 152,583.
- 384 Dionysius begins the Punic war.
- 379 The Bœotian war commences.
- 377 A general conspiracy of the Greek states against the Lacedæmonians.
- 373 A great earthquake in Peloponnesus.
- 371 The Lacedæmonians defeated by Epaminondas at Leuctra.
- 367 Prætors established in Rome. The Licinian law passed.
- 363 Epaminondas killed at the battle of Mantinea.
- 359 The obliquity of the ecliptic observed to be 23° 49' 10".
- 358 The Social war began.
- 357 Dionysius expelled from Syracuse.
A transit of the moon over Mars observed.
- 356 The Sacred war begun in Greece.
Birth of Alexander the Great.
- 345 Dionysius II. expelled from Syracuse.
Commencement of the Syracusan era.
- 338 Philip of Macedon gains the battle of Chæronæa, and thus attains to the sovereignty of Greece.
- 335 Thebes taken and rased by Alexander the Great.
- 334 The Persians defeated at Granicus, May 22.
- 333 They are again defeated at Issus in Cilicia, October.
- 332 Alexander takes Tyre, and marches to Jerusalem.
- 331 Alexandria built.
Darius entirely defeated at Arbela.
- 330 Alexander takes Babylon, and the principal cities of the Persian empire.
The Calippic period commences.
- 328 Alexander passes Mount Caucasus, and marches into India.
- 327 He defeats Porus, an Indian prince, and founds several cities.
- 326 The famous sedition of Corcyra.
- 324 His family exterminated, and his dominions parted by his officers.
- 323 Alexander the Great dies at Babylon.
- 315 Rhodes almost destroyed by an inundation.
- 311 The Appian way, aqueducts, &c. constructed at Rome.
- 308 The cities of Greece recovered their liberties for a short time.
- 307 Antioch, Seleucia, Laodicea, and other cities, founded by Seleucus.
- 301 Antigonus defeated and killed at Ipsus.
- 299 The first barbers came from Sicily to Rome.
- 294 The number of effective men in Rome amounts to 270,000.
- 293 The first sun-dial erected at Rome by Papius Cursor.

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- Before Christ. } 285 Dionysius of Alexandria began his astronomical era on Monday June 26. being the first who found the exact solar year to consist of 365 days 5 hours and 49 minutes.
The watch-tower of Pharos at Alexandria built.
Ptolemy Philadelphus, king of Egypt, employs 72 interpreters to translate the Old Testament into the Greek language, which is called the *Septuagint*.
- 284 The foundations of the Achæan republic laid.
- 283 The college and library founded at Alexandria.
- 282 The Tarentine war begins.
- 280 Pyrrhus invades Italy.
- 279 A census at Rome. The number of citizens 278,222.
- 269 The first coining of silver at Rome.
- 265 The number of Roman citizens augmented to 292,224.
- 264 The first Punic war begins, and continues 23 years. The chronology of the Arundelian marbles composed.
- 262 A transit of Mercury over the bull's horn; the planet being in 23° of γ , and the sun in 29° $30'$ ν .
- 260 Provincial questors established at Rome.
The Romans first concern themselves in naval affairs, and defeat the Carthaginians at sea.
- 255 Regulus, the Roman consul, defeated and taken prisoner by the Carthaginians under Xantippus.
- 252 A census at Rome. The number of citizens 297,897.
- 247 Another census. The number of citizens 251,212.
- 246 The records of China destroyed.
- 241 Conclusion of the first Punic war.
- 240 Comedies first acted at Rome.
- 237 Hamilcar, the Carthaginian, causes his son Hannibal, at nine years old, to swear eternal enmity to the Romans.
- 236 The Tartars expelled from China.
- 235 Rome at peace with other nations. The temple of Janus shut.
- 231 Corfica and Sardinia subdued by the Romans.
The first divorce at Rome.
- 230 The obliquity of the ecliptic observed by Eratosthenes to be 23° $51'$ $20''$.
- 224 The Colossus at Rhodes overturned by an earthquake.
- 219 The art of surgery introduced at Rome.
- 218 Commencement of the second Punic war.
Hannibal passes the Alps, and invades Italy.
- 216 The Romans defeated at Cannæ, May 21st.
- 214 Syracuse besieged by Marcellus.
- 209 A census at Rome. The number of citizens 227,107.
- 208 Asdrubal invades Italy; but is defeated and killed.
- 206 Gold first coined at Rome.
- 202 Hannibal defeated by Scipio at Zama.
- 201 Conclusion of the second Punic war.
- 194 Sparta and Hither Spain subdued by the Romans.
- 192 A census at Rome. The number of citizens 243,704.
- 191 Antiochus defeated by the Romans at Thermopylæ.
- 190 The first Roman army enters Asia, and from the spoils of Antiochus brings the Asiatic luxury first to Rome.
- 188 The Spartans obliged to renounce the institutions of Lycurgus.
- 179 A census at Rome. The number of citizens 273,244.
- 173 The Jewish high-priesthood sold by Antiochus Epiphanes.
- 170 Paper invented in China.
The temple of Jerusalem plundered by Antiochus.
- 169 A census at Rome. The number of citizens 212,805.
- 168 Macedon reduced to the form of a Roman province.
The first library erected at Rome.
- 165 The temple of Jerusalem purified by Judas Maccabeus.
- 164 A census at Rome. The number of citizens 327,032.
- 162 Hipparchus began his astronomical observations at Rhodes.
- 161 Philosophers and rhetoricians banished from Rome.
- 150 The third Punic war commenced.
- 146 Corinth destroyed.
Carthage, the rival to Rome, is raised to the ground by the Romans.
A remarkable comet appeared in Greece.
- 143 Hipparchus began his new cycle of the moon, consisting of 111,035 days.
- 141 The Numantine war commenced.
- 135 The history of the Apocrypha ends.
- 133 Numantia destroyed by Scipio.
- 124 A census at Rome. The number of citizens 390,736.
- 105 The Cimbri and Teutones defeated the Romans.
- 102 The Teutones and Ambrones defeated by Marius.
- 88 Rome besieged by the chiefs of the Marian faction.
- 82 Sylla created perpetual dictator at Rome.
- 69 A census at Rome. The number of citizens 450,000.
- 66 Catiline's conspiracy.
- 55 Julius Cæsar makes his first expedition into Britain.
Crassus defeated and killed by the Parthians.
- 51 Gaul reduced to a Roman province.
- 50 A census at Rome. The number of citizens 320,000.
- 48 The battle of Pharsalia, between Cæsar and Pompey, in which the latter is defeated.
The Alexandrian library, consisting of 400,000 valuable books, burnt by accident.
- 45 The war of Africa, in which Cato kills himself.
The solar year introduced by Cæsar.
- 44 Cæsar, the greatest of the Roman conquerors, after having fought 50 pitched battles, and slain 1,192,000 men, is killed in the senate-house by conspirators.
- 42 The republicans defeated at Philippi.
- 31 The battle of Actium fought, in which Mark Antony

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- Antony and Cleopatra are totally defeated by Octavius, nephew to Julius Cæsar.
- 30 Alexandria, in Egypt, is taken by Octavius, upon which Antony and Cleopatra put themselves to death, and Egypt is reduced to a Roman province.
- 29 A census at Rome. The number of citizens 4,101,017.
- 27 Octavius, by a decree of the senate, obtains the title of Augustus Cæsar, and an absolute exemption from the laws, and is properly the first Roman emperor.
The pantheon at Rome built.
- 19 Rome at the height of its glory.
The temple of Jerusalem rebuilt by Herod.
Agrippa constructed the magnificent aqueducts at Rome.
- 8 A census at Rome. The number of citizens 4,233,000.
- 5 The temple of Janus is shut by Augustus, as an emblem of universal peace; and JESUS CHRIST is born, on Monday, December 25.
- 1 The Vulgar Christian era commenced from January 1. the Saviour of the world being then five years of age.
- 8 Jesus Christ disputes with the doctors in the temple.
- 14 A census at Rome, 4,370,000 citizens.
- 16 Mathematicians and magicians expelled from Rome.
- 17 Twelve cities in Asia destroyed by an earthquake.
- 27 Pilate made governor of Judea.
- 29 Jesus baptized in Jordan by John.
- 33 He is crucified at Jerusalem.
- 35 St Paul converted.
- 39 St Matthew writes his gospel.
Pontius Pilate kills himself.
A conjunction of Saturn, Jupiter, and Mars.
- 40 The name of Christians first given at Antioch to the followers of Christ.
- 43 Claudius Cæsar's expedition into Britain.
- 44 St Mark writes his gospel.
- 50 London is founded by the Romans: 368, surrounded by ditto with a wall, some parts of which are still observable.
- 51 Caractacus, the British king, is carried in chains to Rome.
- 52 The council of the Apostles at Jerusalem.
- 55 St Luke writes his Gospel.
- 56 Rotterdam built.
- 59 The emperor Nero puts his mother and brothers to death.
— persecutes the Druids in Britain.
- 60 Christianity introduced into Britain.
- 61 Boadicea, the British queen, defeats the Romans; but is conquered soon after by Suetonius, governor of Britain.
- 62 St Paul is sent in bonds to Rome—writes his epistles between 51 and 66.
- 63 The Acts of the Apostles written.
A great earthquake in Asia.
- 64 Rome set on fire, and burned for six days; upon

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- which began (under Nero) the first persecution against the Christians.
- 65 Many prodigies seen about Jerusalem.
- 66 St Peter and St Paul put to death.
- 70 While the factious Jews are destroying one another with mutual fury, Titus the Roman general takes Jerusalem, which is rased to the ground, and the plough made to pass over it.
- 73 The philosophers banished from Rome by Vespasian.
- 79 The cities of Pompeii and Herculaneum destroyed by an eruption of Vesuvius.
- 80 The Capitol and Pantheon at Rome destroyed by fire.
- 83 The philosophers expelled Rome by Domitian.
- 85 Julius Agricola, governor of South-Britain, to protect the civilized Britons from the incursions of the Caledonians, builds a line of forts between the rivers Forth and Clyde; defeats the Caledonians under Galgacus on the Grampian hills; and first sails round Britain, which he discovers to be an island.
- 86 The Capitoline games instituted by Domitian.
- 88 The secular games celebrated at Rome.
- 93 The empire of the Huns in Tartary destroyed by the Chinese.
The Evangelist John banished to Patmos.
- 94 The second persecution of the Christians, under Domitian.
- 96 St John the Evangelist wrote his Revelation—his Gospel in 97.
- 103 Dacia reduced to a Roman province.
- 105 A great earthquake in Asia and Greece.
- 107 The third persecution of the Christians, under Trajan.
- 114 Armenia reduced to a Roman province.
A great earthquake in China.
- 115 Assyria subdued by Trajan.
An insurrection of the Jews, who murder 200,000 Greeks and Romans.
A violent earthquake at Antioch.
- 120 Nicomedia and other cities swallowed up by an earthquake.
- 121 The Caledonians reconquer from the Romans all the southern parts of Scotland; upon which the emperor Adrian builds a wall between Newcastle and Carlisle; but this also proving ineffectual, Pollius Urbicus, the Roman general, about the year 134, repairs Agricola's forts, which he joins by a wall four yards thick.
- 130 Jerusalem rebuilt by Adrian.
- 132 The second Jewish war commenced.
- 135 The second Jewish war ends, when they were all banished Judea.
- 139 Justin writes his first apology for the Christians.
- 141 A number of heresies appear about this time.
- 146 The worship of Serapis introduced at Rome.
- 152 The emperor Antoninus Pius stops the persecution against the Christians.
An inundation of the Tiber, and an earthquake at Rhodes.
- 163 The fourth persecution of the Christians, under Marcus Aurelius Antoninus.
- 166 The Romans sent ambassadors to China.

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- 168 A plague over the known world.
 188 The Capitol at Rome destroyed by lightning.
 191 A great part of Rome destroyed by fire.
 203 The fifth persecution of the Christians, under Severus.
 205 An earthquake in Wales.
 209 Severus's wall in Britain built.
 218 Two comets appeared at Rome. The course of the most remarkable from east to west.
 222 About this time the Roman empire begins to decline. The Barbarians begin their irruptions, and the Goths have annual tribute not to molest the empire.
 225 Mathematicians allowed to teach publicly at Rome.
 236 The sixth persecution of the Christians, under Maximin.
 241 The Franks first mentioned in history.
 250 The seventh persecution, under Decius.
 252 A dreadful pestilence broke out in Ethiopia, and spread over the world.
 The eighth persecution, under Gallus.
 253 Europe ravaged by the Scythians and Goths.
 258 The ninth persecution, under Valerian.
 260 Valerian is taken prisoner by Sapor, king of Persia, and slayed alive.
 The Scythians ravaged the Roman empire.
 The temple of Diana at Ephesus burnt.
 261 A great plague throughout the Roman empire.
 262 Earthquakes in Europe, Asia, and Africa, and three days of darkness.
 273 The Romans took Palmyra.
 274 Silk first brought from India; the manufactory of it introduced into Europe by some monks, 551; first worn by the clergy in England, 1534.
 276 Wines first made in Britain.
 277 The Franks settled in Gaul.
 284 The Dioclesian era commenced August 29th, or September 17th.
 287 Carausius proclaimed emperor of Britain.
 289 A great comet visible in Mesopotamia for 29 days.
 291 Two emperors and two Cæsars march to defend the four quarters of the empire.
 297 Alexandria destroyed by Dioclesian.
 303 The tenth persecution, under Dioclesian.
 306 Constantine the Great begins his reign.
 308 Cardinals first began.
 312 Pestilence all over the East.
 Cycle of induction began.
 313 The tenth persecution ends by an edict of Constantine, who favours the Christians, and gives full liberty to their religion.
 314 Three bishops, or fathers, are sent from Britain to assist at the council of Arles.
 315 Crucifixion abolished.
 321 Observation of Sunday enjoined.
 323 The first general council at Nice, when 318 fathers attended, against Arius, the founder of Arianism, where was composed the famous Nicene Creed, which we attribute to them.
 328 Constantine removes the seat of empire from Rome to Byzantium, which is thereafter called Constantinople.
 330 A dreadful persecution of the Christians in Persia, which lasts 40 years.
 333 Constantine orders all the heathen temples to be destroyed.
 334 Three hundred thousand Sarmatians revolted from their masters.
 341 The gospel propagated in Ethiopia by Frumentius.
 344 Neocæsarea ruined by an earthquake.
 351 The heathens first called Pagans.
 358 A hundred and fifty cities in Asia and Greece overturned by an earthquake.
 360 The first monastery founded near Poitiers in France, by Martin.
 363 The Roman emperor Julian, surnamed the Apostate, endeavours in vain to rebuild the temple of Jerusalem.
 364 The Roman empire is divided into the Eastern (Constantinople the capital) and Western (of which Rome continued to be the capital), each being now under the government of different emperors.
 373 The Bible translated into the Gothic language.
 376 The Goths settled in Thrace.
 379 The cycle of Theophilus commenced.
 390 A fiery column seen in the air for 30 days.
 400 Bells invented by Bishop Paulinus of Campania.
 401 Europe overrun by the Goths, under Alaric.
 404 Another irruption of the Goths.
 The kingdom of Caledonia, or Scotland, revives under Fergus.
 406 Third irruption of the Goths.
 The Vandals, Alans, and Suevi, spread into France and Spain, by a concession of Honorius, emperor of the West.
 408 The Christian religion propagated in Persia.
 409 Rome taken and plundered by the Goths, August 24.
 412 The Vandals begin their kingdom in Spain.
 413 The kingdom of Burgundy begun in Alsace.
 415 The kingdom of Thoulouse founded by the Visigoths.
 417 The Alans extirpated by the Goths.
 419 Many cities in Palestine destroyed by an earthquake.
 420 The kingdom of France begins upon the Lower Rhine, under Pharamond.
 421 The Salique law promulgated.
 426 The Romans, reduced to extremities at home, withdraw their troops from Britain, and never return: advising the Britons to arm in their own defence, and trust to their own valour.
 432 The gospel preached in Ireland by St Patrick.
 444 All Europe ravaged by the Huns.
 446 The Britons, now left to themselves, are greatly harassed by the Scots and Picts, upon which they once more make their complaint to the Romans (which they entitle, *The Groans of the Britons*), but receive no assistance from that quarter.
 447 Attila (surnamed the Scourge of God) with his Huns ravage the Roman empire.
 449 Vortigern, king of the Britons, invites the Saxons into Britain, against the Scots and Picts.

- After Christ. 452 The city of Venice founded.
- 455 The Saxons having repulsed the Scots and Picts, invite over more of their countrymen, and begin to establish themselves in Kent, under Hengist.
- 476 The western empire is finished, 523 years after the battle of Pharfalia; upon the ruins of which several new states arise in Italy and other parts, consisting of Goths, Vandals, Huns, and other barbarians, under whom literature is extinguished, and the works of the learned are destroyed.
- 480 A great earthquake at Constantinople, which lasted 40 days.
- 493 Italy reduced by Theodoric king of the Goths.
- 496 Clovis, king of France, baptized, and Christianity begins in that kingdom.
- 506 The Jews talmud published.
- 508 Prince Arthur begins to reign over the Britons.
- 510 Paris made the capital of the French dominions.
- 515 Constantinople besieged by Vitalianus, whose fleet is burnt by a speculum of brass made by Proclus.
- 516 The computing of time by the Christian era is introduced by Dionysius the monk.
- 517 Five years drought and famine in Palestine.
- 519 A bearded comet appears.
- 529 The codex of Justinian, the eastern emperor, is published.
- 534 The kingdom of the Vandals in Africa comes to an end, after having continued 105 years.
- 536 The manufacture of silk introduced at Constantinople by two Indian monks.
- 540 Antioch destroyed by the Persians.
- 541 Basilus the last consul elected at Rome.
- 532 Antioch rebuilt.
- 542 An earthquake all over the world.
- 550 An earthquake in Palestine and Syria.
The kingdom of Poland founded.
- 551 An earthquake in Greece, attended with a great commotion in the sea.
- 553 The empire of the Goths in Italy destroyed by Narfes.
A great earthquake at Constantinople.
- 557 Another violent earthquake at Constantinople, Rome, &c.
A terrible plague all over Europe, Asia, and Africa, which continues near 50 years.
- 568 The Lombards founded a kingdom in Italy.
- 569 The Turks first mentioned in history.
The exarchate of Ravenna begins.
- 575 The first monarchy founded in Bavaria.
- 580 Antioch destroyed by an earthquake.
- 581 Latin ceased to be spoken about this time in Italy.
- 584 The origin of fiefs in France.
- 588 The city of Paris destroyed by fire.
- 589 Rome overflowed by the Tiber.
- 593 The Gascons establish themselves in the country called by their name.
- 596 John of Constantinople assumes the title of universal bishop.
- 597 Augustine the monk comes into England with forty monks.
- 599 A dreadful pestilence in Africa.
- 604 St Paul's church in London founded.
- 605 The use of bells introduced into churches.
- 606 Here begins the power of the popes, by the concessions of Phocas, emperor of the East.
- 622 Mahomet, the false prophet, flies from Mecca to Medina in Arabia, in the 44th year of his age, and 10th of his ministry, when he laid the foundation of the Saracen empire, and from whom the Mahometan princes to this day claim their descent. His followers compute their time from this era, which in Arabic is called *begira*, i. e. "the Flight."
- 628 An academy founded at Canterbury.
- 632 The era of Jesdegird commenced June 16th.
- 637 Jerusalem is taken by the Saracens, or followers of Mahomet.
- 641 Alexandria in Egypt is taken by ditto, and the grand library there burnt by order of Omar, their caliph or prince.
- 643 The temple of Jerusalem converted into a Mahometan mosque.
- 653 The Saracens now extend their conquests on every side, and retaliate the barbarities of the Goths and Vandals upon their posterity.
They take Rhodes, and destroy the famous Colossus.
England invaded by the Danes.
- 660 Organs first used in churches.
- 663 Glass invented by a bishop, and brought into England by a Benedictine monk.
- 669 Sicily invaded, and Syracuse destroyed by the Saracens.
- 685 The Britons, after a brave struggle of near 150 years, are totally expelled by the Saxons, and drove into Wales and Cornwall.
- 698 The Saracens take Carthage, and expel the Romans from Africa.
- 700 Cracow built, and first prince of Poland elected.
- 704 The first province given to the Pope.
- 713 The Saracens conquer Spain.
- 714 France governed by Charles Martel.
- 718 The kingdom of the Asturias in Spain founded by Pelagio.
- 719 Christianity promulgated in Germany.
- 726 The controversy about images begins, and occasions many insurrections in the eastern empire.
- 727 Tax of Peter's pence begun by Ina king of Wessex.
- 732 Charles Martel defeats the Saracens near Tours.
- 735 Institution of the office of Pope's nuncio.
- 746 Three years pestilence in Europe and Asia.
- 748 The computing of years from the birth of Christ began to be used in history.
- 749 The race of Abbas become caliphs of the Saracens, and encourage learning.
The empire of the Saracens divided into three.
- 752 The exarchate of Ravenna abolished by Astolphus king of the Lombards.
- 755 Commencement of the Pope's temporal dominion.
- 762 The city of Bagdad upon the Tigris is made the capital for the caliphs of the house of Abbas.

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| After
Christ. | 762 Burials, which formerly used to be in highways, permitted in towns.
792 An academy founded in Paris.
794 The Huns extirpated by Charlemagne.
797 Seventeen days of unusual darkness.
800 Charlemagne, king of France, begins the empire of Germany, afterwards called the Western empire; gives the present names to the winds and months; endeavours to restore learning in Europe, but mankind are not yet disposed for it, being solely engrossed in military enterprises.
801 A great earthquake in France, Germany, and Italy.
807 Jan. 31. Jupiter eclipsed by the moon. March 17. A large spot seen on the sun for eight days.
808 The first descent of the Normans on France.
825 The obliquity of the ecliptic observed by Benimula to be $23^{\circ} 55'$.
826 Harold, king of Denmark, dethroned by his subjects for being a Christian.
The kingdoms of Navarre and Arragon founded.
832 Painters banished out of the eastern empire.
836 The Flemings trade to Scotland for fish.
840 The Scots and Picts have a decisive battle, in which the former prevail, and both kingdoms are united by Kenneth, which begins the second period of the Scottish history.
842 Germany separated from the empire of the Franks.
856 An earthquake over the greatest part of the known world.
861 Ruric the first prince of Russia began to reign.
864 The Danes begin their ravages in England.
867 Christianity propagated in Bulgaria.
868 Egypt becomes independent on the caliphs of Bagdad.
872 Bells and clocks first used in Constantinople.
873 France distressed by locusts and pestilence.
874 Iceland peopled by the Norwegians.
Scotland invaded by the Danes.
875 A bearded comet appears in France.
878 Alfred the Great, after subduing the Danish invaders (against whom he fought 56 battles by sea and land), composes his body of laws; divides England into counties, hundreds, tythings; in 890 erects county-courts, having founded the university of Oxford in 886.
880 The obliquity of the ecliptic observed by Albategni to be $23^{\circ} 35'$.
889 The Hungarians settled near the Danube.
891 The first land tax in England.
895 The monastery of Cluny founded.
905 A very remarkable comet appeared in China.
Rome taken by the Normans.
911 The obliquity of the ecliptic observed by Thebit to be $23^{\circ} 33' 30''$.
912 The Normans establish themselves in Normandy.
913 The Danes become masters of England.
915 The university of Cambridge founded.
923 Fiefs established in France.
925 Sigefroi elected first marquis of Brandenburg.
928 The marquisate of Misnia established. | 937 The Saracen empire is divided by usurpation into seven kingdoms.
941 Arithmetic brought into Europe.
961 Candia recovered from the Saracens.
967 Antioch recovered from the Saracens.
969 The race of Abbas extinguished in Egypt.
975 Pope Boniface VII. is deposed and banished for his crimes.
977 Greece, Macedon, and Thrace, ravaged by the Bulgarians for ten years.
The Bohemians subdued by Otho.
979 Coronation oath first used in England.
Juries first instituted in ditto.
985 The Danes under Sueno invade England and Scotland.
987 The Carolingian race in France ended.
991 The figures in arithmetic are brought into Europe by the Saracens from Arabia; letters of the alphabet were hitherto used.
993 A great eruption of Mount Vesuvius.
995 England invaded by the Danes and Norwegians.
996 Otho III. makes the empire of Germany elective.
999 Boleslaus, the first king of Poland.
The obliquity of the ecliptic observed by Aboul Wafi and Abu Hamed to be $23^{\circ} 35''$.
1000 Paper made of cotton rags was in use; that of linen rags in 1170; the manufactory introduced into England at Deptford, 1588.
1002 The emperor Henry assumed the title of king of the Romans.
1005 All the old churches are rebuilt about this time in a new manner of architecture.
1006 A plague in Europe for three years.
1007 A great eruption of Vesuvius.
The obliquity of the ecliptic observed by Albategnius to be $23^{\circ} 35'$.
1014 Sueno the Dane becomes master of England.
Sept. 28. Almost all Flanders laid under water by a storm.
1015 Children forbidden by law to be sold by their parents in England.
1017 Rain of the colour of blood for three days in Aquitain.
1022 A new species of music invented by Aretin.
1035 Togrul-Beg, or Tangrolipix, the Turkish sultan, establishes himself in Korasan.
The kingdoms of Castile and Arragon began.
1040 The Danes, after several engagements with various success, are about this time driven out of Scotland, and never again return in a hostile manner.
Smyrna destroyed by an earthquake.
1041 The Saxon line restored under Edward the Confessor.
1043 The Turks become formidable and take possession of Persia.
The Russians come from Scythia, and land in Thrace.
1054 Leo IX. the first pope that kept up an army.
1055 The Turks take Bagdad, and overturn the empire of the Saracens.
1057 Malcolm III. king of Scotland, kills the tyrant Macbeth at Dunfinnan, and marries the princess Margaret, sister to Edgar Atheling. |
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After
Christ.

- After Christ. 1061 Surnames appointed to be taken in Scotland by a parliament held in Forfar.
- 1065 The Turks take Jerusalem from the Saracens.
- 1066 The conquest of England by William (surnamed the Bastard) duke of Normandy, in the battle of Hastings, where Harold is slain.
- 1070 The feudal law introduced into England.
- 1075 Henry IV. emperor of Germany, and the pope, quarrel about the nomination of the German bishops. Henry, in penance, walks barefooted to the pope towards the end of January.
- 1076 Justices of the peace first appointed in England. An earthquake in England. Asia Minor, having been two years under the power of Soliman, is from this time called Turkey.
- 1080 Doomſday-book began to be compiled by order of William, from a survey of all the estates in England, and finished in 1086. The tower of London built by ditto, to curb his English subjects; numbers of whom fly to Scotland, where they introduce the Saxon or English language, are protected by Malcolm, and have lands given them.
- 1086 The order of Carthusians established by Bruno.
- 1090 The dynasty of Bathineens or Assassins, begins in Irak, and continues for 117 years.
- 1091 The Saracens in Spain, being hard pressed by the Spaniards, call to their assistance Joseph king of Morocco; by which the Moors get possession of all the Saracen dominions in Spain.
- 1096 The first crusade to the Holy Land is begun under several Christian princes, to drive the infidels from Jerusalem.
- 1098 The order of St Benedict instituted.
- 1099 Jerusalem taken by the crusaders; Godfrey elected king of it; and the order of knights of St John instituted.
- 1110 Edgar Atheling, the last of the Saxon princes, dies in England, where he had been permitted to reside as a subject. Learning revived at Cambridge. Writing on paper made of cotton common about this time.
- 1118 The order of the Knights Templars instituted, to defend the Sepulchre at Jerusalem, and to protect Christian strangers.
- 1119 Bohemia erected into a kingdom.
- 1132 The kingdom of Portugal began.
- 1137 The pandect of Justinian found in the ruins of Amalphi.
- 1141 The factions of the Guelphs and Gibellines prevailed about this time.
- 1143 The Koran translated into Latin.
- 1144 The Peripatetic philosophy introduced into Germany.
- 1151 The canon law collected by Gratian, a monk of Bologna.
- 1154 Christianity introduced into Finland.
- 1156 The city of Moscow in Russia founded.
- 1156 The order of the Carmelites instituted.
- 1163 London bridge, consisting of 19 small arches, first built of stone.
- 1164 The Teutonic order of religious knights begins in Germany.
- 1171 The dynasty of the Fatemites ended in Egypt; the sovereigns of this country henceforth called Sultans.
- 1172 Henry II. king of England, (and first of the Plantagenets), takes possession of Ireland; which from that period has been governed by an English viceroy, or lord-lieutenant.
- 1176 England is divided by Henry into six circuits, and justice is dispensed by itinerant judges.
- 1179 The university of Padua founded.
- 1180 Glass windows began to be used in private houses in England.
- 1181 The laws of England are digested about this time by Glanville.
- 1182 Pope Alexander III. compelled the kings of England and France to hold the stirrups of his saddle when he mounted his horse.
- 1183 Seven thousand Albigenes massacred by the inhabitants of Berry.
- 1186 A conjunction of all the planets at sunrise September 16. The Sun in $30^{\circ} 11'$; Jupiter in $2^{\circ} 3' 2''$; Venus in $3^{\circ} 49'$; Saturn in $8^{\circ} 6'$; Mercury in $4^{\circ} 10'$; Mars, $9^{\circ} 8'$; tail of the Dragon, $18^{\circ} 23' 2''$.
- 1187 Jerusalem taken by Saladin.
- 1192 The battle of Ascalon, in Judea, in which Richard, king of England, defeats Saladin's army, consisting of 300,000 combatants.
- 1194 *Dieu et mon Droit*, first used as a motto by Richard, on a victory over the French.
- 1195 Denmark and Norway laid waste by a dreadful tempest.
- 1198 Institution of the order of the Holy Trinity.
- 1200 Chimnies were not known in England. Surnames now began to be used; first among the nobility. University of Salamanca in Spain founded.
- 1204 Constantinople taken by the French and Venetians. The Inquisition established. The empire of Trebizond established.
- 1208 London incorporated, and obtained their first charter for electing their lord mayor and other magistrates from King John. The order of *Fratres Minores* established. The pope excommunicates King John.
- 1209 The works of Aristotle imported from Constantinople into Europe. The silk manufacture imported from Greece into Venice.
- 1210 The works of Aristotle condemned to be burnt at Paris. The emperor Otho excommunicated by the pope. Violent persecution of the Albigenes.
- 1215 Magna Charta is signed by King John and the barons of England. Court of common pleas established. Orders of the Dominicans and Knights Hospitallers founded. The doctrine of transubstantiation introduced.
- 1216 King Alexander and the whole kingdom of Scotland excommunicated by the pope's legate.

After
Christ.

After
Christ.

- 1220 Astronomy and geography brought into Europe by the Moors.
- 1222 A great earthquake in Germany.
- 1223 A comet of extraordinary magnitude appeared in Denmark.
- 1226 A league formed against the Albigenses by the French king and many prelates and lords.
- 1227 The Tartars under Jenghiz-Khan emerge from the northern parts of Asia, overrun all the Saracen empire, and carry death and desolation wherever they march.
- 1228 The university of Thoulouse founded.
- 1230 The kingdom of Denmark distressed by pestilence.
The kingdoms of Leon and Castile united.
Prussia subdued by the Teutonic knights.
University of Naples founded.
- 1231 The Almagest of Ptolemy translated into Latin.
- 1233 The Inquisition, begun in 1204, is now trusted to the Dominicans.
The houses of London, and other cities in England, France, and Germany, still thatched with straw.
- 1238 The university of Vienna founded.
- 1239 A writing of this year's date on paper made of rags still extant.
- 1241 The Hanseatic league formed.
Tin mines discovered in Germany.
- 1245 A clear red star, like Mars, appears in Capricorn.
- 1250 Painting revived in Florence by Cimabue.
- 1251 Wales subdued, and Magna Charta confirmed.
- 1253 The famous astronomical tables are composed by Alonso king of Castile.
- 1256 The order of the Augustines established.
- 1258 The Tartars take Bagdad, which finishes the empire of the Saracens.
- 1260 The sect of Flagellantes appeared in Italy.
- 1263 Acho king of Norway invades Scotland with 160 sail, and lands 20,000 men at the mouth of the Clyde; but they are cut to pieces by Alexander III. who recovers the western isles.
- 1264 The commons of England first summoned to parliament about this time.
- 1268 The Tartars invade China.
- 1269 The Hamburg company incorporated in England.
The obliquity of the ecliptic observed by Cozah Nasirodni to be $23^{\circ} 30'$.
Westminster abbey rebuilt and consecrated in the presence of Henry III.
- 1272 The academy of Florence founded.
- 1273 The empire of the present Austrian family begins in Germany.
The obliquity of the ecliptic observed by Cheouking in China to be $23^{\circ} 33' 39''$.
- 1274 The first commercial treaty betwixt England and Flanders.
- 1279 King Edward renounced his right to Normandy. The mortmain act passed in England.
- 1282 Lewellyn, prince of Wales, defeated and killed by Edward I. who unites that principality to England.
A great pestilence in Denmark.
8000 French murdered at the Sicilian vespers.
Academy de la Crusca founded.
- 1284 Edward II. born at Caernarvon, is the first prince of Wales.
- 1285 Alexander III. king of Scotland, dies, and that kingdom is disputed by twelve candidates, who submit their claims to the arbitration of Edward king of England; which lays the foundation of a long and desolating war between both nations.
- 1290 The university of Lisbon founded.
- 1291 Ptolemais taken by the Turks. End of the crusades.
- 1293 There is a regular succession of English parliaments from this year, being the 22d of Edward I.
- 1294 Parliament established in Paris.
- 1298 The present Turkish empire begins in Bithynia under Ottoman.
Silver-hafted knives, spoons, and cups, a great luxury.
Tallow-candles so great a luxury, that splinters of wood were used for lights.
Wine sold by apothecaries as a cordial.
The Scots defeated by the English at Falkirk.
- 1299 An earthquake in Germany.
Spectacles invented by a monk of Pisa.
The year of jubilee instituted by Boniface VIII.
- 1302 The mariner's compass invented, or improved, by Giovia of Naples.
The university of Avignon founded.
- 1307 The beginning of the Swiss cantons.
Coal first used in England.
- 1308 The popes removed to Avignon in France for 70 years.
- 1310 Lincoln's Inn society established.
The knights of St John take possession of the isle of Rhodes.
- 1314 The battle of Bannockburn, between Edward II. and Robert Bruce, which establishes the latter on the throne of Scotland.
The cardinals set fire to the conclave and separate.
A vacancy in the papal chair for two years.
- 1315 Germany afflicted with famine and pestilence.
- 1319 The university of Dublin founded.
- 1320 Gold first coined in Christendom; 1344 ditto in England.
An earthquake in England.
- 1323 A great eruption of Mount Ætna.
- 1325 The first treaty of commerce betwixt England and Venice.
- 1330 Gunpowder invented by a monk of Cologne.
- 1332 The pope accused of heresy.
- 1336 Two Brabant weavers settle at York, which, says Edward III. may prove of great benefit to us and our subjects.
- 1337 The first comet whose course is described with an astronomical exactness.
Europe infested by locusts.
- 1340 Heralds college instituted in England.
Copper money first used in Scotland and Ireland.
- 1344 The first creation to titles by patents used by Edward III.
- 1345 Edward III. had four pieces of cannon, which gained him the battle of Cressy.
- 1347 The battle of Durham, in which David, king of Scots, is taken prisoner.

After
Christ.

- 1349 The order of the Garter instituted in England by Edward III. altered in 1557, and consists of 26 knights.
- 1352 The Turks first enter Europe.
- 1353 Asia and Africa desolated by locusts.
- 1354 The money in Scotland till now the same as in England.
- 1356 The battle of Poitiers, in which King John of France and his son are taken prisoners by Edward the Black Prince.
- 1357 Coals first brought to London.
- 1358 Arms of England and France first quartered by Edward III.
University of Cologne founded.
Tamerlane began to reign in Persia.
- 1362 The law pleadings in England changed from French to English in favour of Edward III. to his people.
The military order of Janizaries established among the Turks.
- 1365 The universities of Vienna and Geneva founded.
- 1369 John Wickliffe an Englishman begins to call in question the doctrines of the church of Rome about this time, whose followers are called Lollards.
- 1370 The office of grand vizir established.
- 1377 Inundation of the sea in Flanders.
- 1378 Greenland discovered by a Venetian.
- 1381 Bills of exchange first used in England.
- 1384 The first act of navigation in England; no goods to be exported or imported by Englishmen in foreign bottoms.
- 1386 A company of linen weavers from the Netherlands established in London.
Windfor castle built by Edward III.
- 1387 The first Lord High Admiral of England instituted.
- 1388 The battle of Otterburn between Hotspur and the earl of Douglas.
Bombs invented at Venloo.
- 1391 Cards invented in France for the king's amusement.
- 1399 Westminster abbey rebuilt and enlarged—Westminster hall ditto.
Order of the Bath instituted at the coronation of Henry IV. renewed in 1725, consisting of 84 knights.
- 1402 Tamerlane defeats and takes prisoner Bajazet the Turkish sultan.
- 1405 The Canary islands discovered by Bathencourt a Norman.
- 1410 Guildhall, London, built.
Painting in oil colours invented at Bruges by John Van-eyck.
- 1411 The university of St Andrew's in Scotland founded
- 1412 Algebra brought from Arabia into Europe.
- 1415 The battle of Agincourt gained over the French by Henry V. of England.
- 1420 The island of Madeira discovered by the Portuguese.
- 1421 The revenue of England amounted to 55,754l.
- 1428 The siege of Orleans, the first blow to the English power in France.
- 1431 A great earthquake at Lisbon.

After
Christ.

- 1432 Great inundations in Germany.
- 1427 The obliquity of the ecliptic observed by Ulug Beg to be $23^{\circ} 30' 17''$.
- 1440 Printing invented by L. Koster at Haerlem in Holland; brought into England by W. Caxton, a mercer of London, 1471.
- 1446 The Vatican library founded at Rome.
The sea breaks in at Dort in Holland and drowns 100,000 people.
- 1453 Constantinople taken by the Turks, which ends the eastern empire, 1123 years from its dedication by Constantine the Great, and 2206 years from the foundation of Rome.
- 1454 The university of Glasgow in Scotland founded.
- 1457 Glass first manufactured in England.
- 1460 Engraving and etching on copper invented.
The obliquity of the ecliptic observed by Purbachius and Regiomontanus to be $23^{\circ} 29'$.
- 1473 The study of the Greek language introduced into France.
- 1477 The university of Aberdeen in Scotland founded.
- 1479 Union of the kingdoms of Arragon and Castile.
- 1482 The coast of Guinea discovered by the Portuguese.
A court of inquisition erected in Seville.
- 1485 Richard III. king of England, and last of the Plantagenets, is defeated and killed at the battle of Bosworth, by Henry (Tudor) VII. which put an end to the civil wars between the houses of York and Lancaster, after a contest of 30 years, and the loss of 100,000 men.
- 1487 Henry establishes fifty yeomen of the guards, the first standing army.
- 1489 Maps and sea charts first brought to England by Barth. Columbus.
- 1490 William Groceyn introduces the study of the Greek language into England.
The Moors, hitherto a formidable enemy to the native Spaniards, are entirely subdued by Ferdinand, and become subjects to that prince on certain conditions, which are ill observed by the Spaniards, whose clergy use the inquisition in all its tortures; and in 1609, near one million of the Moors were driven from Spain to the opposite coast of Africa, from whence they originally came.
- 1492 America first discovered by Columbus, a Genoese, in the service of Spain.
The Moors expelled from Granada, which they had possessed upwards of 800 years.
- 1495 The venereal disease introduced into Europe.
- 1496 The Jews and Moors banished out of Portugal.
- 1497 The Portuguese first sail to the East Indies by the Cape of Good Hope.
South America discovered by Americus Vesputius, from whom unjustly it has its name.
- 1499 North America discovered, for Henry VII. by Cabot, a Venetian.
- 1500 Maximilian divides the empire of Germany into six circles, and adds four more in 1512.
Brazil discovered by the Portuguese. Florida discovered by John Cabot, an Englishman.
Painting in chiaro oscuro discovered.
A great plague in England.
- 1505 Shillings first coined in England.

After
Christ.

After
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- 1507 The island of Madagascar discovered by the Portuguese.
- 1509 Gardening introduced into England from the Netherlands, from whence vegetables were imported hitherto.
- 1510 The obliquity of the ecliptic observed by Wrennus to be $23^{\circ} 28' 30''$.
- 1513 The battle of Flowden, in which James IV. king of Scotland is killed, with the flower of his nobility.
- 1514 Cannon bullets of stone still in use.
- 1515 The first Polyglot Bible printed at Alcalá. The kingdom of Navarre annexed to that of Castile by Ferdinand.
- 1516 The kingdom of Algiers seized by Barbarossa.
- 1517 Martin Luther began the reformation. Egypt is conquered by the Turks. The kingdom of the Mamelukes in Egypt overthrown by the Turks.
- 1518 Discovery of New Spain, and the Straits of Magellan.
- 1521 Henry VII. for his writings in favour of popery, receives the title of Defender of the Faith from his Holiness.
- 1522 Rhodes taken by the Turks. The first voyage round the world performed by a ship of Magellan's squadron.
- 1526 The inquisition established in Portugal. Lutheranism established in Germany.
- 1527 Rome taken and plundered by the Imperial army.
- 1528 Popery abolished in Sweden.
- 1529 The name of Protestant takes its rise from the reformers protesting against the church of Rome, at the diet of Spires in Germany.
- 1530 Union of the Protestants at Smalcald, December 22d. Secretary of State's office established in England.
- 1531 A great earthquake at Lisbon.
- 1532 The Court of Session instituted in Scotland.
- 1533 Insurrection of the Anabaptists in Westphalia.
- 1534 The reformation takes place in England, under Henry VIII. Barbarossa seized on the kingdom of Tunis.
- 1535 The Reformation introduced into Ireland. The society of Jesuits formed.
- 1539 The first English edition of the Bible authorized; the present translation finished in 1611. About this time cannon began to be used in ships. Six hundred and forty-five religious houses suppressed in England and Wales.
- 1540 The variation of the compass discovered by Sebastian Cabot. The obliquity of the ecliptic observed by Copernicus to be $23^{\circ} 28' 8''$. Society of the Jesuits established, September 27.
- 1543 Silk stockings first worn by the French king; first worn in England by Queen Eliz. 1561; the steel frame for weaving invented by the Rev. Mr Lee, of St John's College, Cambridge, 1589. Pins first used in England, before which time the ladies used skewers. Iron cannon and mortars made in England.
- 1544 Good lands let in England at one shilling per acre.
- 1545 The famous council of Trent begins, and continues 18 years.
- 1547 First law in England establishing the interest of money at 10 per cent.
- 1548 The Reformation gained ground in Poland.
- 1549 Lords lieutenants of counties instituted in England.
- 1550 Horse guards instituted in England. The bank of Venice established about this time.
- 1552 Books of geography and astronomy destroyed in England, as being infected with magic. The book of Common Prayer established in England by act of parliament.
- 1554 The kingdom of Astracan conquered by the Russians.
- 1555 The Russian company established in England.
- 1558 Queen Elizabeth begins her reign.
- 1560 The Reformation in Scotland completed by John Knox.
- 1561 Livonia ceded to Poland.
- 1563 Knives first made in England.
- 1565 Revolt of the Low Countries. Malta attacked by the Turks.
- 1566 The 39 articles of the church of England established.
- 1568 Queen Mary imprisoned in England. Liberty of professing the reformed religion granted to the Low Countries.
- 1569 Royal Exchange first built.
- 1571 The island of Cyprus taken by the Turks. They are defeated at Lepanto.
- 1572 The great massacre of Protestants at Paris. A new star in Cassiopeia observed by Cornelius Gamma. It appeared in November, and disappeared in March.
- 1576 The profession of the Protestant religion authorized in France. This toleration followed by a civil war.
- 1578 The first treaty of alliance betwixt England and the States General, January 7.
- 1579 The Dutch shake off the Spanish yoke, and the republic of Holland begins. English East India company incorporated—established 1600. ———Turkey company incorporated.
- 1580 Sir Francis Drake returns from his voyage round the world, being the first English circumnavigator. Parochial registers first appointed in England. The kingdom of Portugal seized by Philip of Spain.
- 1581 Copper first used in France.
- 1582 Pope Gregory introduces the New Style in Italy; the 5th of October being counted the 15th.
- 1583 Tobacco first brought from Virginia into England. The first proposal of settling a colony in America.
- 1587 Mary queen of Scots is beheaded by order of Elizabeth, after 18 years imprisonment.
- 1588 The Spanish Armada destroyed by Drake and other English admirals. Henry IV. passes the edict of Nantes, tolerating the Protestants.

- After
Christ
- 1588 Duelling with small swords introduced into England.
- 1589 Coaches first introduced into England; hackney act 1693; increased to 1000 in 1770.
- 1590 Band of pensioners instituted in England.
Telescopes invented by Jansen, a spectacle-maker in Germany.
- 1591 Trinity College, Dublin, founded.
- 1593 A great plague in London.
- 1594 The Jesuits expelled from France.
The obliquity of the ecliptic observed by Byrgius to be $23^{\circ} 30'$.
- 1595 The same observed by Tycho-Brahe to be $23^{\circ} 29' 25''$.
- 1596 A great earthquake at Japan.
- 1597 Watches first brought into England from Germany.
- 1598 The edict of Nantes by Henry IV. of France.
- 1602 Decimal arithmetic invented at Bruges.
- 1603 Queen Elizabeth (the last of the Tudors) dies, and nominates James VI. of Scotland as her successor; which unites both kingdoms under the name of Great Britain.
- 1605 The Gunpowder-plot discovered at Westminster; being a project to blow up the king and both houses of parliament.
- 1606 Oaths of allegiance first administered in Britain.
- 1608 Colonies sent from Britain to Virginia.
- 1609 The independency of the United States acknowledged by Spain.
- 1610 Galileo, of Florence, first discovers the satellites about the planet Jupiter, by the telescope, lately invented in Germany.
Henry IV. is murdered at Paris, by Ravailac, a priest.
Thermometers invented by Drebel, a Dutchman.
- 1611 Barons first created in Britain by James I. May 22.
An earthquake at Constantinople; 200,000 persons died there of the plague.
- 1612 The north-west passage to China attempted in vain by the British.
- 1614 Napier of Marcheston, in Scotland, invents the logarithms.
Sir Hugh Middleton brings the new river to London from Ware.
- 1616 The first permanent settlement in Virginia.
- 1619 W. Harvey, an Englishman, confirms the doctrine of the circulation of the blood, which had been first broached by Servetius, a French physician, in 1553.
- 1620 The broad silk manufacture from raw silk, introduced into England.
Barbadoes discovered by Sir William Courteen.
Navarre united to France.
Copper-money first introduced in England.
- 1621 New England planted by the Puritans.
The two parties of Whigs and Tories formed in Britain.
- 1622 The Palatinate reduced by the Imperialists.
- 1623 The Knights of Nova Scotia instituted.
- 1624 Massacre of the English at Amboyna.
- 1625 King James dies, and is succeeded by his son, Charles I.
- 1625 The island of Barbadoes, the first British settlement in the West Indies, is planted.
- 1631 The transit of Mercury over the sun's disk, first observed by Gassendi.
A great eruption of Vesuvius.
- 1632 The battle of Lutzen, in which Gustavus Adolphus, king of Sweden, and head of the Protestants in Germany, is killed.
- 1633 Galileo condemned by the inquisition at Rome.
Louisiana discovered by the French.
- 1635 Province of Maryland planted by Lord Baltimore.
Regular posts established from London to Scotland, Ireland, &c.
- 1636 A transit of Mercury over the sun's disk observed by Cassini.
- 1639 A transit of Venus over the sun's disk, first observed by Mr Horrox, November 24. O. S. 3 h. 15' P. M.
- 1640 King Charles disoblige his Scottish subjects; on which their army, under General Lesley, enters England, and takes Newcastle, being encouraged by the malecontents in England.
The massacre in Ireland, when 40,000 English Protestants were killed.
The independency of Portugal recovered by John duke of Braganza.
- 1642 King Charles impeaches five refractory members, which begins the civil wars in England.
- 1643 Excise on beer, ale, &c. first imposed by parliament.
Barometers invented by Torricelli.
- 1648 A new star observed in the tail of the Whale by Fabricius.
- 1649 Charles I. beheaded by Cromwell at Whitehall, January 30. aged 49.
Pendulums first applied to clocks by Huygens.
- 1651 The sect called Quakers appeared in England.
- 1652 The Dutch colony at the Cape of Good Hope established.
- 1653 Cromwell assumes the protectorship.
The air-pump is invented by Otto Guericke of Magdeburg.
- 1655 The English, under Admiral Penn, take Jamaica from the Spaniards.
One of Saturn's satellites observed by Huygens.
- 1658 Cromwell dies, and is succeeded in the protectorship by his son Richard.
- 1660 King Charles II. is restored by Monk, commander of the army, after an exile of twelve years in France and Holland.
The people of Denmark, being oppressed by the nobles, surrender their privileges to Frederic III. who becomes absolute.
- 1661 The obliquity of the ecliptic observed by Hevelius to be $23^{\circ} 29' 7''$.
- 1662 The Royal Society established at London by Charles II.
- 1663 Carolina planted: 1728, divided into two separate governments.
Prussia declared independent of Poland.
- 1664 The New Netherlands in North America conquered from the Swedes and Dutch by the English.
- After
Christ.

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- 1665 The plague rages in London, and carries off 68 000 persons.
The magic lantern invented by Kircher.
- 1666 The great fire of London began Sept. 2. and continued three days, in which were destroyed 13,000 houses and 400 streets.
Tea first used in England.
- 1667 The peace of Breda, which confirms to the English the New Netherlands, now known by the names of Pennsylvania, New York, and New Jersey.
- 1668 — ditto, Aix-la Chapelle.
St James's Park planted and made a thoroughfare for public use by Charles II.
- 1669 The island of Candia taken by the Turks.
- 1670 The English Hudson's Bay company incorporated.
The obliquity of the ecliptic observed by Mengoli to be $23^{\circ} 28' 24''$.
- 1672 Louis XIV. overruns great part of Holland, when the Dutch open their sluices, being determined to drown their country, and retire to their settlements in the East Indies.
African company established.
The obliquity of the ecliptic observed by Richer to be $23^{\circ} 28' 54''$.
- 1677 The micrometer invented by Kircher.
- 1678 The peace of Nimeguen.
The habeas corpus act passed.
A strange darkness at noonday, Jan. 12.
- 1680 A great comet appeared, and from its nearness to our earth alarmed the inhabitants. It continued visible from Nov. 3. to March 9.
William Penn, a Quaker, receives a charter for planting Pennsylvania.
- 1683 India stock sold from 360 to 500 per cent.
- 1685 Charles II. dies, aged 55, and is succeeded by his brother James II.
The duke of Monmouth, natural son to Charles II. raises a rebellion, but is defeated at the battle of Sedgmore, and beheaded.
The edict of Nantes is revoked by Louis XIV. and the Protestants are greatly distressed.
- 1686 The Newtonian philosophy published.
- 1687 The palace of Versailles, near Paris, finished by Louis XIV.
- 1688 The revolution in Great Britain begins Nov. 5. King James abdicates, and retires to France, December 23.
King William and Queen Mary, daughter and son-in-law to James, are proclaimed February 13.
Viscount Dundee stands out for James in Scotland, but is killed by General Mackay at the battle of Killycrankie; upon which the Highlanders, wearied with repeated misfortunes, disperse.
Smyrna destroyed by an earthquake.
- 1689 The land-tax passed in England.
The toleration-act passed in ditto.
William Fuller, who pretended to prove the prince of Wales spurious, was voted by the commons to be a notorious cheat, impostor, and false accuser.
Several bishops are deprived for not taking the oaths to William.

- 1689 Episcopacy abolished in Scotland.
- 1690 The battle of the Boyne, gained by William against James, in Ireland.
- 1691 The war in Ireland finished by the surrender of Limerick to William.
The obliquity of the ecliptic observed by Flamstead to be $23^{\circ} 28' 32''$.
- 1692 The English and Dutch fleets, commanded by Admiral Ruffel, defeat the French fleet off La Hogue.
The massacre of Glencoe in Scotland, Jan. 31. O. S.
Earthquakes in England and Jamaica, September 8.
Hanover made an electorate of the empire.
- 1693 Bayonets at the end of loaded muskets first used by the French against the confederates in the battle of Turin.
Bank of England established by King William.
The first public lottery was drawn this year.
- 1694 Queen Mary dies at the age of 33, and William reigns alone.
Stamp-duties instituted in England.
- 1697 The peace of Ryswick.
- 1699 The Scots settled a colony at the isthmus of Darien in America, and called it *Caledonia*.
- 1700 Charles XII. of Sweden begins his reign.
- 1701 King James II. dies at St Germain's, in the 68th year of his age.
Prussia erected into a kingdom.
Society for the propagation of the gospel in foreign parts established.
- 1702 King William dies, aged 50. and is succeeded by Queen Anne, daughter to James II. who, with the emperor and states general, renews the war against France and Spain.
The French sent colonies to the Mississippi.
- 1703 The obliquity of the ecliptic observed by Bianchini to be $23^{\circ} 28' 25''$.
- 1704 Gibraltar taken from the Spaniards by Admiral Rooke.
The battle of Blenheim won by the duke of Marlborough and allies against the French.
The Court of Exchequer instituted in England.
- 1706 The treaty of union betwixt England and Scotland, signed July 22.
The battle of Ramillies won by Marlborough and the allies.
- 1707 The first British parliament.
The allies defeated at Almanza.
- 1708 Minorca taken from the Spaniards by General Stanhope.
The battle of Oudenarde won by Marlborough and the allies.
- 1709 Peter the Great, czar of Moscow, defeats Charles XII. at Poltowa, who flies to Turkey.
The battle of Malplaquet won by Marlborough and the allies.
- 1710 Queen Anne changes the Whig ministry for others more favourable to the interest of her brother the late pretender.
The cathedral church of St Paul, London, rebuilt by Sir Christopher Wren in 37 years, at one million expence, by a duty on coals.
The English South-sea company began.

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- 1712 Duke of Hamilton and Lord Mohun killed in a duel in Hyde-park.
- 1713 The peace of Utrecht, whereby Newfoundland, Nova Scotia, New Britain, and Hudson's Bay in North America, were yielded to Great Britain; Gibraltar and Minorca in Europe were also confirmed to the said crown by this treaty.
- 1714 Queen Anne dies at the age of 50, and is succeeded by George I.
Interest reduced to five per cent.
- 1715 Louis XIV. dies, and is succeeded by his great-grandson Louis XV.
The rebellion in Scotland begins in September, under the earl of Mar, in favour of the Pretender. The action of Sheriffmuir, and the surrender of Preston, both in November, when the rebels disperse.
The obliquity of the ecliptic observed by Louville to be $23^{\circ} 28' 24''$.
- 1716 The pretender married the princess Sobieska, grand-daughter of John Sobieski, late king of Poland.
An act passed for septennial parliaments.
- 1718 Sardinia erected into a kingdom, and given to the duke of Savoy.
- 1719 The Mississippi scheme at its height in France. Lomb's silk-throwing machine, containing 26,586 wheels, erected at Derby: takes up one-eighth of a mile; one water-wheel moves the rest; and in twenty-four hours it works 318,504,960 yards of organzine silk-thread.
- 1720 The South-sea scheme in England begun April 7. was at its height at the end of June, and quite sunk about September 29.
A great earthquake in China.
- 1724 An earthquake in Denmark.
- 1727 King George dies, in the 68th year of his age; and is succeeded by his only son, George II.
Inoculation first tried on criminals with success.
Russia, formerly a dukedom, is now established as an empire.
The aberration of the fixed stars discovered and accounted for by Dr Bradley.
- 1732 Kouli Khan usurps the Persian throne, conquers the Mogul empire, and returns with two hundred and thirty-one millions sterling.
Several public-spirited gentlemen begin the settlement of Georgia in North America.
- 1733 The Jesuits expelled from Paraguay.
- 1736 Captain Porteous having ordered his soldiers to fire upon the populace at the execution of a smuggler, is himself hanged by the mob at Edinburgh.
A transit of Mercury observed by Cassini.
- 1737 A dreadful hurricane at the mouth of the Ganges, October 10.
- 1738 Westminster-bridge, consisting of 15 arches, begun; finished in 1750 at the expence of 389,000*l.* defrayed by parliament.
The order of St Januarius established at Naples.
- 1739 Letters of marque issued out in Britain against Spain July 21. and war declared, Oct. 23.
The empire of Indostan ruined by Kouli Khan.
An intense frost in Britain.
- 1743 The battle of Dettingen won by the English and allies in favour of the queen of Hungary.
- 1743 A dreadful plague in Sicily.
- 1744 War declared against France.—Commodore Anson returns from his voyage round the world.
- 1745 The allies lose the battle at Fontenoy.
The rebellion breaks out in Scotland, and the Pretender's army defeated by the duke of Cumberland at Culloden, April 16. 1746.
- 1746 British Linen Company erected.
Lima destroyed by an earthquake.
- 1747 Kouli Khan murdered.
- 1748 The peace of Aix-la-Chapelle, by which a restitution of all places taken during the war was to be made on all sides.
- 1749 The interest on the British funds reduced to three per cent.
British herring-fishery incorporated.
The colony of Nova Scotia founded.
- 1750 Earthquake in England.
- 1751 Frederic prince of Wales, father to his present majesty, died.
Antiquarian Society at London incorporated.
- 1752 The new stile introduced into Great Britain; the 3d of September being counted the 14th.
- 1753 The British Museum erected at Montague-house. Society of arts, manufactures, and commerce, instituted in London.
- 1754 A dreadful eruption of Mount *Ætna*.
A great earthquake at Constantinople, Cairo, &c. Sept. 2.
- 1755 Quito in Peru destroyed by an earthquake, April 28.
Lisbon destroyed by an earthquake, Nov. 1.
- 1756 146 Englishmen are confined in the black hole at Calcutta in the East Indies by order of the Nabob, and 123 found dead next morning.
Marine society established at London.
The king of Prussia commenced hostilities in the month of August in Saxony. Defeats the Austrians at Lo.
- 1757 Damien attempted to assassinate the French king. The king of Prussia invades Bohemia. Defeats the Austrians at Reichenberg, April 21. and at Prague, May 6. Repulsed by Count Daun at Kolin, June 18.
The allies defeated by the French at Hastenbeck, July 26.
Convention of Closter-Seven, Sept. 8.
The king of Prussia defeats the French and Austrians at Rosbach, Nov. 5. The Prussians defeated near Breslaw, Nov. 22. The Austrians defeated at Lissa, Dec. 5.
- 1758 Senegal taken by the British, May 1. They take Louisbourg, July 27.
The king of Prussia defeats the Russians at Zorndorf, Aug. 25. Is defeated by Count Daun at Hoch-kirchen, Oct. 14.
Goree taken by Commodore Keppel, Dec. 29.
Attempt to assassinate the king of Portugal Dec. 3.
- 1759 General Wolfe is killed in the battle of Quebec, which is gained by the British.
The French defeated by Prince Ferdinand at Bergen, April. 13.
Guadaloupe taken by the British, May 1.
King of Prussia defeated by the Russians at Cunenrdorf, Aug. 12.

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- 1759 The French fleet defeated by Admiral Hawke, Nov. 20.
Balbec and Tripoli destroyed by an earthquake, Dec. 5.
- 1760 King George II. dies Oct. 25. in the 77th year of his age, and is succeeded by his present majesty, who, on the 22d September 1761, married the princess Charlotte of Mecklenburgh Strelitz.
Blackfriars bridge, consisting of 9 arches, begun; finished 1770, at the expence of 152,840l. to be discharged by a toll.
- 1761 A transit of Venus over the sun, June 6.
Earthquakes in Syria Oct. 13.
The king of Prussia defeats the Austrians at Torgau, Nov. 3.
Pondicherry taken by Col. Coote, Jan. 15.
Belleisle surrendered to the British Feb. 4.
- 1762 War declared against Spain.
Peter III. emperor of Russia, is deposed, imprisoned, and murdered.
American philosophical society established in Philadelphia.
George Augustus Frederic, prince of Wales, born Aug. 12.
Martinico surrendered to the British Feb. 4.
Havannah surrendered to ditto Aug. 12.
Manilla taken by ditto Oct. 6.
- 1763 The definitive treaty of peace between Great Britain, France, Spain, and Portugal, concluded at Paris February 10th; which confirms to Great Britain the extensive province of Canada, East and West Florida, and part of Louisiana, in North America; also the islands of Grenada, St Vincent, Dominica, and Tobago, in the West Indies.
The Jesuits expelled from France.
- 1764 The parliament granted 10,000l. to Mr Harrison for his discovery of the longitude by his time-piece.
Famine and pestilence in Italy.
An earthquake at Lisbon.
- 1765 His majesty's royal charter passed for incorporating the society of artists.
An act passed annexing the sovereignty of the island of Man to the crown of Great Britain.
- 1766 April 21st, a spot or macula of the sun, more than thrice the bigness of our earth, passed the sun's centre.
The American stamp-act repealed March 18.
A great earthquake at Constantinople.
The Jesuits expelled from Bohemia and Denmark.
- 1767 The Jesuits expelled from Spain, Venice, and Genoa, April 2d.
Martinico almost destroyed by an earthquake.
The Protestants tolerated in Poland Nov. 2d.
- 1768 Academy of painting established in London.
The Turks imprison the Russian ambassador, and declare war against that empire.
The Jesuits expelled from Naples, Malta, and Parma.
- 1769 Paoli fled from Corsica June 13. The island then reduced by the French.
- 1770 An earthquake at St Domingo.
- 1771 Dr Solander and Mr Banks, in his majesty's ship the Endeavour, Lieut. Cook, return from a voyage round the world, having made several important discoveries in the South seas.
An emigration of 500,000 Tourgouths from the coasts of the Caspian sea to the frontiers of China.
- 1772 The king of Sweden changes the constitution from aristocracy to a limited monarchy.
The Pretender marries a princess of Germany, grand-daughter of Thomas late earl of Aylebury.
The emperor of Germany, empress of Russia, and the king of Prussia, strip the king of Poland of a great part of his dominions, which they divide among themselves, in violation of the most solemn treaties.
- 1773 Captain Phipps is sent to explore the North Pole; but having made 81 degrees, is in danger of being locked up by the ice, and his attempt to discover a passage in that quarter proves fruitless.
The English East India Company having, by conquest or treaty, acquired the extensive provinces of Bengal, Orixa, and Bahar, containing 15 millions of inhabitants, great irregularities are committed by their servants abroad; upon which government interferes, and sends out judges, &c. for the better administration of justice.
The war between the Russians and the Turks proves disgraceful to the latter, who lose the islands in the Archipelago, and by sea are everywhere unsuccessful.
The society of Jesuits suppressed by the pope's bull, Aug. 25.
- 1774 Peace is proclaimed between the Russians and the Turks.
The British parliament having passed an act laying a duty of 3d. per pound upon all teas imported into America, the colonists, considering this as a grievance, deny the right of the British parliament to tax them.
The American colonies send deputies to Philadelphia, who assume the title of *The Congress of the Thirteen United Provinces*, and all the powers of government.
- 1775 The American war commences. Action at Bunker's Hill June 7.
The Spaniards land near Algiers, and are defeated July 8.
- 1776 The congress declare the United States of America independent of the crown and parliament of Great Britain.
The Americans receive a dreadful defeat at Long Island Aug. 27.
- 1777 Philadelphia taken by the British Oct. 3.
General Burgoyne with his army surrenders to the Americans.
- 1778 A most extraordinary eruption of Vesuvius August 8.
The siege of Gibraltar begun by the Spaniards July 8.
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- 1780 Jan. 14th, 6h. A. M. the thermometer suspended in the open air at Glasgow, stood at 46° below 0.
The Spanish fleet defeated by Admiral Rodney Jan. 16th.
Charlestown surrendered to the British May 12th.
A dreadful insurrection in London, and riots in many other places of the kingdom.
A great number of British ships taken by the combined fleets of France and Spain.
Lord Cornwallis defeats the Americans at Camden.
A dreadful hurricane in the Leeward Islands Oct. 9th.
An extraordinary storm of wind in England.
War declared against the Dutch Dec. 20th.
- 1781 A terrible engagement between the Dutch and British fleets near the Dogger Bank August. 5th.
Lord Cornwallis with his army surrenders to the united forces of France and America Oct. 18th.
- 1782 Minorca surrendered to the Spaniards February 4th.
The French fleet under De Grasse defeated and almost destroyed by Admiral Rodney April 12th.
The Spanish floating batteries before Gibraltar entirely destroyed Sept. 12.
- 1783 Preliminaries of a general peace signed. America declared independent Jan. 20th.
A dreadful earthquake, attended with many extraordinary circumstances, in Italy and Sicily.
The sun obscured by a kind of fog during the whole summer.
A volcanic eruption in Iceland surpassing any thing recorded in history. The lava spouted up in three places to the height of two miles perpendicular, and continued thus for two months; during which time it covered a tract of 3600 square miles of ground, in some places more than 100 feet deep.
A large meteor appears to the northward of Shetland, and takes its direction southward, with a velocity little inferior to that of the earth in its annual course round the sun. Its track observed for more than 1000 miles.
Algiers bombarded by the Spaniards.
A great tumult at Philadelphia between the inhabitants and French soldiery.
An extraordinary aurora borealis seen at London.
Bednore taken by the English.
Magazine at Bencoolen blown up.
Bottles made of the lava of volcanoes.
Byrne, the Irish giant, eight feet four inches, dies by intemperance.
Famine in the Carnatic.
Charles Gustavus prince of Sweden dies.
A father kills three of his children with the thigh-bone of a horse after hearing a sermon on the happiness of those who die young.
Sir Eyre Coote defeats Hyder Ally.
Cremnitz in Hungary destroyed by lightning.

- 1783 Dartmouth East Indiaman lost.
Definitive treaties between Britain and France, Spain and America concluded.
The East India house robbed.
Thanks to General Elliot voted by the house of commons.
Embargo on salt in Ireland taken off.
A forest in Poland suddenly disappears.
Island of Formosa destroyed by an earthquake.
Gold and silver lace prohibited in Denmark.
A conspiracy against the Grand Signior discovered.
Grosvenor Indiaman lost.
Mangalore surrenders to the British.
Five meteors or fire-balls seen at different places in England.
Serious mutinies at Portsmouth, Jersey, Guernsey, Dublin, &c.
A plague breaks out at Constantinople.
Powder mills at Ewell blown up.
A man in Moscow has 84 children alive out of 87 by three wives.
Queen Charlotte delivered of a princess.
- 1784 General Cornwallis made constable of the Tower.
Sluices at Lillo opened by the Dutch.
Great earthquakes in Iceland, Grenoble, &c.
Fort Frederick at Grenada blown up.
Commodore Lindsay visited by the king and queen of Naples.
Pennsylvania in extreme distress.
A general thanksgiving for peace with America, &c.
Allan Ramsay, Esq. son of the celebrated poet of the same name, dies at Dover.
St Augustine in Florida declared a free port.
A gang of desperate robbers apprehended at Glasgow.
A volcano discovered in the moon.
- 1785 Melancholy fate of two aeronauts.
A singular calamity at Barbadoes, by the sinking of the surface in different places.
A new comet discovered.
The queen of France is delivered of a son.
A remarkable accident happens in the court of king's bench.
A dreadful inundation happens at Vienna in Germany.
- 1786 The Halfewell East Indiaman struck on the rocks of Purbeck, and about 100 of the crew perished Jan. 6th.
Joiner's works performed by a blind man in such a masterly manner as to astonish the ablest judges, at Hermanstadt in Transilvania.
- 1786 The king of Prussia makes a handsome provision during life for the widow and children of Colonel Vantroske, a deserving officer. April.
The west tower of Hereford church, 125 feet high, built in the 12th century, fell down on the evening of 17th April, but no people then in the church-yard received any injury.
M. Blanchard ascends in a balloon 96 miles in as many minutes. Writes a letter in the air, dated April 18th to the editors of the Paris Journal.

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- To the number of 6398 boys and girls, clothed, educated, and supported by voluntary contributions, assemble under the dome of St Paul's cathedral.
- A small prayer-book composed by Queen Elizabeth, and in her own hand-writing, sold in London for 100 guineas, June 7th.
- The prince of Wales orders his whole stud to be disposed of by auction, to enable him to liquidate his debts.
- 1787 The king of Prussia establishes a court of honour for the purpose of suppressing duelling.
- A meeting of notables convened by the king of France for reforming abuses relating to the subject of finance, January 10th.
- Two ships sailed from Gravesend with black people on board, for a new settlement at Sierra Leone, January 9th.
- The king of Poland has an interview with her imperial majesty at Kiow, March 7th.
- Nine ships sailed for Botany Bay from Spithead with convicts, 21st.
- A motion in parliament for repealing the test and corporation acts, 28th.
- M. de Calonne is dismissed from office, April 10th.
- Mr Hastings impeached at the bar of the house of lords, May 10th.
- petitions to be admitted to bail, 22d.
- The sum of 161,000l. voted for the liquidation of the Prince of Wales's debts, 24th.
- The Hartwell East Indiaman lost off the island of Bona Vista, 24th.
- Two satellites belonging to Georgium Sidus discovered by Dr Herschel, June 7th.
- The Russian ambassador at Constantinople imprisoned, August 16th.
- The Prussian troops under the duke of Brunswick take possession of Utrecht, Sept. 17th.
- Twenty-three sail of the line put into commission, and seventeen new admirals appointed, Sept. 24th.
- The Prussians gain possession of Amsterdam, October, 11th.
- A most remarkable aurora borealis appears, 13th.
- Lord George Gordon apprehended, and committed to Newgate, December 7th.
- 1788 Died at Bryngwyn in Radnorshire six persons during the month of January, whose united ages made up 644 years.
- A new copper coinage of halfpence begins to circulate in Britain, July 19th.
- William Brodie and George Smith tried for breaking into the general excise office for Scotland, and sentenced to be executed September 1st.
- 1788 A dreadful hurricane at Martinico laid many parishes waste, and deprived multitudes of their existence, August 14th.
- The king of France abolished the torture, and ordained that every accused person shall have counsel immediately assigned him, October 18th. He ordered also, that a majority of one may acquit the accused, while three are required to condemn.
- An iron barge built by John Wilkinson, Esq. at Wilby wharf Shrewsbury, was launched, drawing only eight inches water, and moving very easily on that element, November 7th.
- His Britannic majesty is seized with a severe indisposition, October 17th.
- A new comet in the constellation of Urfa Major discovered by M. Messier astronomer at Paris, November 26th.
- 1789 Coins bearing date 1057 were found beneath the foundation of the old markethouse at Farnham.
- Another satellite discovered by Dr Herschel belonging to Saturn.
- Earthquake at Comrie, November 3d.
- Foundation stone of that magnificent structure, the university of Edinburgh, laid by the Right Honourable Francis Lord Napier, grand master-mason of Scotland, November 16th.
- Phipps (father and son) hanged for forgery, September, 5th.
- Revolution of France is begun and gradually advanced.
- General Washington makes a splendid entrance into the city of Philadelphia, where a sumptuous entertainment is provided for him by the joyful citizens, April 22d.
- An excellent and cheap dye invented in Germany.
- Dr Withers sentenced to 12 months imprisonment, to pay a fine of 50l. and to find security for five years, himself in 500l. and two others in 250l. each, for defaming the character of Mrs Fitzherbert, November 21st.
- The sum of 261l. 3s. voted to Brook Watson, Esq. to defray the expences of a new invented method of cultivating hemp, December 14th.
- 1790 Exile of the Duke de Orleans.
- Bed of justice instituted in France.
- Calamitous state of affairs in that country.
- The archbishop of Toulouse dismissed from office.
- A convention signed at the Escorial between his Britannic majesty and the king of Spain, October 28th.
- A memorial of the court of Spain delivered to Mr Fitzherbert, June 13th.
- M. Montmorin's letter to the national assembly of France.
- Louis XVI. delivers a speech to the national assembly.
- A blackbird's nest with four eggs found December 25th, near Nuneham in Oxfordshire.
- 1791 Serious riots at Paris.
- The Tiers Etat constitute themselves a national assembly.
- 1791 Paris is surrounded by the military at the desire of the king.
- Prisons set open by the mob, and a great famine in Paris, whether real or artificial is involved in obscurity.
- M. Necker is dismissed from office, and the Bastile demolished.
- M. La Fayette appointed commander in chief of the national guard.
- M. Necker is recalled with every demonstration of joy.

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A most horrid insurrection takes place on the 5th of October.

The royal family comes from Versailles to Paris. The abolition of orders decreed by the assembly. The island of Corsica united to France.

The unpopular and oppressive tax on salt abolished.

M. Necker again resigns, about which time a riot breaks out at Paris, and a serious mutiny in the harbour of Brest.

Foreign powers combine against France.

The king of France flies, is apprehended, and returns.

The city of Paris put under martial law.

The Netherlands revolt from Germany.

Peace is concluded between Austria and Prussia, and between Prussia and Sweden.

The grand vizier is disgraced, and dies.

A peace concluded between Russia and Constantinople.

A convention is entered into with Spain relative to Nootka Sound.

War carried on in India with Tippoo Saib.

The British parliament is dissolved, and the new parliament is soon after opened by a speech from the throne.

A bill is presented in the British parliament for the relief of Protestant Catholics.

The French constitution settled by the assembly, and presented to the king, September 3d.

Accepted of by the king, 13th.

1792 Washington's speech to both houses of congress, October 25th.

A treaty between Britain and Prussia relative to the marriage of the duke of York with Frederica Charlotte.

Gustavus III. of Sweden is assassinated by Ankarstrom.

General Dillon is inhumanly murdered by his own soldiers.

M. Rochambeau resigns the command of the French army in the north, and is succeeded by M. Luckner.

Horrible outrages are committed in Paris on the 20th June.

The French arms are victorious in the Netherlands.

A petition is presented to the assembly, praying for the deposition of Louis XVI.

The palace is abandoned by the royal family of France, and attacked by the federates, at which time the Swiss guards are massacred.

Louis is deposed, and he and his family imprisoned.

War proclaimed by the assembly of France against the king of Hungary and Bohemia, April 20th.

The king of the French writes a confidential letter to the king of Great Britain.

A manifesto against the French revolution by the emperor of Germany and the king of Prussia.

The French national assembly proceeds to the trial of the king. He is condemned and executed,

Jan. 21. after which M. Chauvelin is dismissed from London.

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Dumourier arrests the commissioners sent to bring him to the bar of the convention, and sends them as prisoners to the Austrians. He finally abandons the cause of France as hopeless and desperate. He is succeeded by General Dampier.

The Brissotine party is denounced by the people of Paris.

Marat is committed to the Abbey, but soon released, and assassinated at last by a female from Normandy.

An expedition is undertaken against Dunkirk, which is rendered abortive.

General Custine, the queen, the deputies of the Gironde, Manuel, Houchard, Bailly, Barnave, Rabaut, the duke of Orleans and Madame Roland, are condemned and executed.

Earl Moira makes an unsuccessful descent on the coast of France.

Toulon surrenders to the British, but is retaken by the French.

1794 Earl Stanhope moves that the French republic be acknowledged by Britain.

Mr Adam proposes to amend the criminal law of Scotland, which gives rise to interesting debates.

The first reading of a bill for suspending the Habeas Corpus act is protested against, May 22. Protest against the vote of thanks to Lord Hood, June 17.

The king of Prussia withdraws from the coalition.

A bill is brought into parliament for the abolition of the slave-trade, and rejected by the lords.

General Fitzpatrick moves for an inquiry into the reasons of M. la Fayette's imprisonment.

A motion for peace with France is made by the duke of Bedford and Mr Fox.

Thanks are voted by both houses to Lord Howe, Sir Charles Grey, and Sir John Jervis.

That valuable instrument the *telegraph* is invented by the French.

The bold eloquence of Billaud Varennes, and Tallien, opens the eyes of France respecting the ambitious views of that sanguinary monster Maximilian Robespierre, who is condemned and executed (28th June), with about 20 of his diabolical coadjutors.

General Clairfait is defeated, and Louvain and Namur are taken by the French.

A treaty is entered into between Sweden and Denmark, and neutral powers oblige Britain to indemnify them for their losses.

1795 La Pique of 38 guns captured by Vice-admiral Caldwell, Jan. 4.

Admiral Hotham captures two French ships, *Caira* of 80, and the *Censeur* of 74 guns, Mar. 6.

Warren Hastings acquitted of the serious charges preferred against him by a majority of the house of peers, April 25.

The *Boyne* of 98 guns is blown up at Spithead, but

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but not so much damage done to adjacent vessels as there was reason to dread, all her guns being loaded, May 4.
 Captain Anthony James Pye Molloy dismissed from the command of the *Cæsar* of 74 guns, for neglect of duty.
 Some ships of war belonging to the French taken by the fleet under the command of Admiral Bridport, 23d June.
 Leopold brother to the emperor of Germany died Aug. 10.
 La Minerve of 42 guns captured by Captain Towry June 24.
 The beautiful church of St Paul's, Covent-garden, totally consumed by fire, Sept. 19.
 A shock of an earthquake felt through most of the town of Birmingham, Nov. 23.
 1796 A stone was thrown at his Britannic majesty's carriage on his way from Pall-mall to Buckingham-house, which broke a window and greatly alarmed Lady Harrington, Feb. 1.
 A reward of 1000l. was offered for the apprehension of the criminal, but without effect.
 Admiral Cornwallis is tried on board the *Orion*, for acting contrary to orders received from the admiralty, and acquitted, April 17.
 Sir Sidney Smith taken by the French at Havre, April.
 L'Unité, a French frigate of 38 guns, taken by Captain Cole, and La Virginie of 44 by Sir Edward Pellew, April 13. and 20.
 Crossfield for attempting to assassinate his majesty, was tried and acquitted, May 20.
 Les Trois Couleurs of 10, and La Blonde of 16 guns, captured by Sir Edward Pellew, May 18.; and La Tribune of 44 guns by Captain Martin, same month.
 Two houses fell down in Clare-market, in the ruins of which 17 persons were unfortunately buried, June 27.
 The Amphion frigate of 32 guns blown up at Plymouth, when about 260 lives were lost, Sept. 22.
 The empress Catharine II. of Russia died at her palace of an apoplectic fit, Nov. 17.
 1797 Part of a French fleet came to anchor in Bantry bay, having on board an army of 25,000 men, under the command of General Hoche; but afterwards weighed and stood out to sea, January 2.
 The steeple of a church near Norwich fell down while the bell was ringing for public worship, Jan. 8.
 La Mufette of 22, and Deux Amis of 14 guns, captured by the British, and sent into Cork, Jan. 14.
 The city of Savannah nearly consumed to ashes by fire.
 Sir John Jervis, with a fleet of 15 sail, engages a Spanish fleet of 27 sail of the line, which he defeats, taking the *Salvador del Mundo* and *San Josef* of 112 guns each; the *San Nicolas* of 80 and *San Ysidro* of 74 guns, February 14.

The island of Trinidad surrenders to the British forces under the command of Sir Ralph Abercrombie.
 Alarming symptoms of a mutiny appear among the seamen of the British fleet, May 7.
 The nuptial ceremonies are solemnized between the prince of Wirtemberg Stutgard, and Charlotte Augusta Matilda, eldest daughter of his Britannic majesty George III. May 18.
 Lord Malmesbury appointed minister plenipotentiary from the court of Britain to France for negotiating a treaty of peace, July 1.
 About 30 French war vessels of different dimensions taken or destroyed by the Squadron under Sir J. B. Warren, between 17th July and 6th of September.
 A desperate engagement off Camperdown between Admirals Duncan and De Winter, when the latter is totally defeated by the former, with the loss of 11 ships.
 1798 Le Duguay Trouin, a French privateer, captured by Captain Frazer of his majesty's ship *Shannon*, Feb. 3.
 A powder-mill belonging to Mr Harvey is blown up, which demolishes several adjacent buildings, and kills three of the workmen, April 25.
 L'Hercule, a French ship of 74 guns, captured by the *Mars*, April 21.
 Rebels in the Curragh of Kildare, Ireland, lay down their arms, May 29.
 Wexford rebels defeated with great loss and slaughter, June 10.
 Proposals of the Irish rebels rejected by General Lake, June 22.
 The Princess Amelia East Indiaman accidentally burnt on the coast of Malabar, and 40 of her crew perished, April 5.
 An engagement at Castlebar between General Lake and a party of French landed in Ireland, Aug. 27.
 A dreadful engagement between the British fleet under the command of Sir Horatio Nelson, and the French fleet commanded by Admiral Bruys, off the mouth of the Nile, when nine sail of the line belonging to the French were taken, three burnt, one sunk, and four escaped, Aug. 1.
 The yellow-fever which carried off 3000 people in New York in a few months, happily ceased to rage, Nov. 15.
 1799 A dreadful shock of an earthquake was felt at Guernsey on the night of the 6th.
 A desperate battle fought between the Archduke Charles and General Jourdan at Stockash, March 25.
 La Vigie of 14, and Anacreon privateer of 16 guns taken by his Britannic majesty's ship *Champion*, Captain Graham commander, July 2.
 Three frigates captured by the *Centaur*, J. Wood commander, June 19.
 Mantua surrenders to the Austrians, June 30.
 The British forces destined to invade Holland, begin to disembark, 27th August.

- Seven ships of war, and 13 Indiamen and transports taken in the Nieuve Diep by Admiral Mitchell, August 27.
- Seringapatam surrenders to the British forces, when Tippoo Sultan is slain, 4th May.
- A Spanish frigate called Thetis, with a valuable cargo on board, surrenders to Captain Young of the Ethalion, 16th October.
- British and Russian forces obliged to evacuate Holland, November.
- La Furet of 14 guns strikes to the Viper cutter, Lieutenant Pengelly commander, 26th December.
- 1800 Three French privateers and one Spanish captured by the Aristocrat, Lieutenant Wray, January.
- A French letter of marque with 12 four pounders and 30 men taken by a British long-boat.
- His Britannic majesty's ship Repulse of 64 guns lost, and a number of the crew perished, 9th March.
- A convention between the ambassadors of the Ottoman Porte and General Defaix, signed at El Arifch, 24th January, by which the French troops were permitted to return to their own country.
- His Britannic majesty's ship Danae carried into Brest by the mutineers on board, 27th March.
- Genereux of 74 guns captured by the Northumberland and Foudroyant, February 18.
- A French privateer of 22 guns captured by the Amethyst, Captain Cook commander, 31st March.
- His Britannic majesty shot at in the theatre, May 16, by a maniac of the name of Hadfield.
- The Queen Charlotte of 100 guns is burnt off Leghorn, and the gallant crew perish, 17th March.
- The French ship of war Guillaume Tell of 86 guns and 1000 men surrenders to the Lion, Penelope, and Foudroyant, March 30.
- Le Cerbere of seven guns and 87 men taken by a boat's crew of 20 men, commanded by Lieutenant Coghlan.
- A number of vessels with valuable cargoes captured by La Gironde French privateer, August.
- Unsuccessful expedition against Ferrol, August.
- The French garrison of La Valette surrendered to the allied forces at Malta, 4th September.
- His Britannic majesty's ship Marlborough, of 74 guns, was completely wrecked off Belleisle, 4th November.
- La Venus of 32 guns captured by the Indefatigable and Fisgard, October 24.
- A most dreadful storm at London, which unroofed many houses, blew down others, tore up numbers of trees by the roots, and by the effects of which some lives were lost, 9th November.
- 1801 An embargo laid on all Russian, Danish, and Swedish vessels in the ports of Great Britain, 14th January.
- The united parliament of Great Britain and Ireland met for the first time, January 22.
- The Invincible of 74 guns ran aground on the coast of Norfolk, and was totally lost, when about 400 souls perished, March.
- A dreadful engagement off Copenhagen, between the Danish line, and the British fleet under Admiral Parker; in which 943 of the British were killed and wounded, April 2.
- Aboukir surrenders to the British under the command of Sir Ralph Abercrombie, who received a mortal wound on the 21st March, of which that great officer died on the 28th.
- The French attacked at Rahmanieh, compelled to retreat towards Cairo, and pursued by General Hutchinson, March 9.
- General Hutchinson takes 550 camels, and 600 French prisoners.
- In an engagement between a French and British squadron in the bay of Algeziras, the Hannibal unfortunately fell into the hands of the enemy by taking the ground. The British squadron rendered useless, two of 84, one of 74 guns, and a large frigate, July 5.
- A cessation of arms by sea and land between Britain and the French republic, resulting from the signing of preliminaries of peace by Lord Hawkesbury and M. Otto, October 1.
- Alexandria surrenders to General Hutchinson on the 2d September.
- The Swiftsure captured by Admiral Gantheaume, who treated the crew with the utmost humanity and tenderness.
- 1802 Joseph Wall, governor of the island of Goree in 1782, was executed for ordering a serjeant to receive 800 lashes, of which he died, January 28.
- Mr Moore arrived with the definitive treaty of peace signed at Amiens on the 27th March, at four in the afternoon.
- The flour mills at Bromley, the property of Messrs Metcalf and company, were burnt to the ground, April 8.
- A dreadful fire broke out (May 13) in the town of Bedford, which destroyed 72 houses, and deprived about 700 persons of their all.
- Intercourse forbidden at Wilmington, Delaware, September 5. with Philadelphia and New York, on account of the yellow fever.
- A decision obliging booksellers to publish no books without the name of the printer at the beginning and end of them, was ratified, 20th October.
- General Andreossi, as ambassador from France, arrived at Calais 3d of November, where he was received with discharges of artillery. Has an audience of his Britannic majesty, 17th.
- Lord Whitworth presented to Bonaparte his letters of credence as minister plenipotentiary from his Britannic majesty, December 5.
- 1803 A serious rebellion suppressed in China, occasioned by the efforts of Ong Fong, a daring chief, at the head of 50,000 men.

After
Christ.

One of the queens of the Rajah at Tanjore burns herself on the funeral pile of her deceased husband, in spite of the tears and intreaties of all her relations.

1804 Active measures taken in Dublin to secure the country against invasion.

A ship of 1200 tons cast ashore.

Admiral Story with two captains declared disgraced, perjured, and infamous, degraded

from their posts, and banished the republic, not to return on the pain of death, January 16.

A splendid meteor seen at Perth, February 7. Duke D'Enghien and other emigrants seized, sent to France, and executed, March 15.

The French fleet under Admiral Linois engaged and pursued by a fleet of East Indiamen, commanded by Captain Dance.

After
Christ.

C H R

Chronome-
ter.

CHRONOMETER, in general, denotes any instrument or machine used in measuring time; such are dials, clocks, watches, &c. See DIAL, &c.

The term *chronometer*, however, is generally used in a more limited sense, for a kind of clock so contrived as to measure a small portion of time with great exactness, even to the sixteenth part of a second; of such a one there is a description in Desagulier's experimental philosophy, invented by the late ingenious Mr George Graham; which must be allowed to be of great use for measuring small portions of time in astronomical observations, the time of the fall of bodies, the velocity of running waters, &c. But long spaces of time cannot be measured by it with sufficient exactness, unless its pendulum be made to vibrate in a cycloid; because otherwise it is liable to err considerably, as all clocks are which have short pendulums that swing in large arches of a circle.

There have been several machines contrived for measuring time, under the name of *chronometers*, upon principles very different from those on which clocks and watches are constructed.

Plate CXXXVII. Vol. V. fig. 1. represents an air-chronometer, which is constructed in the following manner: Provide a glass tube of about an inch in diameter, and three or four feet long: the diameter of the inside of this tube must be precisely equal in every part: at the bottom must be a small hole, closely covered with a valve. In the tube place a piston, E. fig. 2. which is made to fit it exactly, and must be oiled, that it may move in the tube with the greatest freedom; in this piston there is a cock that shuts quite close; and from the top of it there goes a cord F, which passes through the handle G. The cock of the piston being closed, it is to be let down to the bottom of the tube, and being then drawn up to the top, the air will then rush in by the valve at the bottom of the tube, and support the piston. You are then to turn the cock, so as to make a very small vent; and the air passing slowly through that vent, the piston will gradually descend and show the hour, either by lines cut in the tube with a diamond, or marked with paint, or by small slips of paper painted on the glass. If this chronometer should go too fast or too slow, it may be easily regulated by altering the position of the cock in the piston, as it is on that the whole depends.

If, instead of marking the tube, you would have the time shown by a dial, it may be easily effected by placing an axis, to which the hand of the dial is fixed, directly over the tube, and winding the string to

C H R

Chronome-
ter.

which the piston is joined round that axis; for then, as the piston descends, the axis will gradually turn the hand, and show the hour: but it must be observed, that as the descent of the piston is not constantly regular, on account of the decrease of resistance from the quantity of the subjacent air as the piston descends, the axis therefore must not be a regular cylinder, but conical like the fusee of a watch, as in fig. 3. by which means the motion of the hand of the dial will be constant and regular.

Fig. 4. represents a lamp-chronometer. It consists of a chamber lamp A, which is a cylindrical vessel about three inches high, and one inch diameter, placed in the stand B. The inside of this vessel must be everywhere exactly of the same diameter. To the stand B is fixed the handle C, which supports the frame DEFG, about 12 inches high, and four wide. This frame is to be covered with oiled paper, and divided into twelve equal parts by horizontal lines; at the end of which are wrote the numbers for the hours, from 1 to 12, and between the horizontal lines are diagonals that are divided into halves, quarters, &c. On the handle B, and close to the glass, is fixed the style or gnomon H. Now, as the distance of the style from the flame of the lamp is only half an inch, if the distance of the frame from the style is only six inches, then, while the float that contains the light descends by the decrease of the oil, one inch, the shadow of the style on the frame will ascend twelve inches, that is, its whole length, and show by its progression the regular increase of the hours, with their several divisions. It is absolutely necessary, however, that the oil used in this lamp be always of the same sort and quite pure, and that the wick also be constantly of the same size and substance, as it is on these circumstances, and the uniform figure of the vessel, that the regular progress of the shadow depends.

CHRONOMETER, among musicians, an instrument invented by *Loulie*, a French musician, for the purpose of measuring time by means of a pendulum. The form of the instrument, as described by him, is that of an Ionic pilaster, and is thus described by Malcolm in his Treatise of Music, p. 407.—“The chronometer consists of a large ruler or board, six feet or 72 inches long, to be set on end; it is divided into its inches, and the numbers set so as to count upwards; and at every division there is a small round hole through whose centre the line of division runs. At the top of this ruler, about an inch above the division 72, and perpendicular to the ruler, is inserted a small piece of

R 2

wood,

Chronometer wood, in the upper side of which there is a groove, hollowed along from the end that stands out to that which is fixed in the ruler, and near each end of it a hole is made: through these holes a pendulum cord is drawn, which runs in the groove: at that end of the cord which comes through the hole furthest from the ruler, the ball is hung: and at the other end there is a small wooden pin, which can be put in any of the holes of the ruler: when the pin is in the uppermost hole at 72, then the pendulum from the top to the centre of the ball must be exactly 72 inches; and therefore, whatever hole of the ruler it is put in, the pendulum will be just so many inches as that figure at the hole denotes. The manner of using the machine is this: The composer lengthens or shortens his pendulum, till one vibration be equal to the designed length of his bar, and then the pin stands at a certain division, which marks the length of the pendulum; and this number being set with the cliff at the beginning of the song, is a direction for others how to use the chronometer in measuring the time according to the composer's design: for with the number is set the note, crotchet, or minim, whose value he would have the vibration to be; which in brisk duple time is best, a minim or half bar; or even a whole bar, when that is but a minim; and in slow time a crotchet. In triple time, it would do well to be the third part or half, or fourth part of a bar; and in the simple triples that are allegro, let it be a whole bar. And if, in every time that is allegro, the vibration is applied to a whole or half bar, practice will teach us to subdivide it justly and equally. Observe, that, to make this machine of universal use, some canonical measure of the divisions must be agreed upon, that the figure may give a certain direction for the length of the pendulum.

CHROSTASIMA, in *Natural History*, a genus of pellucid gems, comprehending all those which appear of one simple and permanent colour in all lights; such are the diamond, carbuncle, ruby, garnet, amethyst, sapphire, beryl, emerald, and the topaz. See **DIAMOND**, **CARBUNCLE**, &c.

CHRYSA, in *Ancient Geography*, a town of Mysia, on the sinus Adramyttenus; extinct in Pliny's time: it had a temple of Apollo Smintheus, (Homer, Strabo). The country of the fair Chryseis, who gave first rise to the quarrel between Agamemnon and Achilles.

CHRYSalis, or **AURELIA**, in *Natural History*, a state of rest and seeming insensibility, which butterflies, moths, and several other kinds of insects, must pass through, before they arrive at their winged or most perfect state.

In this state, no creatures afford so beautiful a variety as the butterfly kinds, and they all pass through this middle state without one exception. The figure of the aurelia or chrysalis generally approaches to that of a cone; or at least the hinder part of it is in this shape; and the creature, while in this state, seems to have neither legs nor wings, nor to have any power of walking. It seems indeed to have hardly so much as life. It takes no nourishment in this state, nor has it any organs for taking any; and indeed its posterior part is all that seems animated, this having a power of giving itself some motions. The external covering of the chrysalis is cartilaginous, and considerably large, and is

usually smooth and glossy: but some few of them have a few hairs; some are also as hairy as the caterpillars from which they are produced; and others are rough, and, as it were, shagreened all over.

In all these there may be distinguished two sides; the one of which is the back, the other the belly, of the animal. On the anterior part of the latter, there may always be distinguished certain little elevations running in ridges, and resembling the fillets wound about mummies: the part whence these have their origin, is esteemed the head of the animal. The other side, or back, is smooth, and of a rounded figure in most of the chrysalises; but some have ridges on the anterior part, and sides of this part; and these usually terminate in a point, and make an angular appearance on the chrysalis.

From this difference is drawn the first general distinction of these bodies. They are by this divided into two classes; the round and the angular kinds. The first are, by the French naturalists, called *feves*; from the common custom of calling the chrysalis of the silk-worm, which is round, by this name.

There is something more regular in this distinction than might at first be conceived; for the division is continued from the fly-state: the rounded chrysalises being almost all produced by the *phalænæ* or moths; and the angular ones by the *papilio*s, or day-flies. There are several subordinate distinctions of these kinds; but, in general, they are less different from one another than the caterpillars from whence they are produced.

The head of those of the first class usually terminates itself by two angular parts, which stand separate one from the other, and resemble a pair of horns. On the back, eminences and marks are discovered, which imagination may form into eyes, nose, chin, and other parts of the human face.

There is a great variety and a great deal of beauty in the figures and arrangement of the eminences and spots on the other parts of the body of the chrysalises of different kinds. It is a general observation, that those chrysalises which are terminated by a single horn, afford day-butterflies of the kind of those which have buttoned antennæ, and whose wings, in a state of rest, cover the under part of their body, and which use all their six legs in walking, those of many other kinds using only four of them. Those chrysalises which are terminated by two angular bodies, and which are covered with a great number of spines, and have the figure of a human face on their back in the greatest perfection, afford butterflies of the day kind; and of that class the characters of which are, their walking on four legs, and using the other two, that is, the anterior part, in the manner of arms or hands. The chrysalises which have two angular bodies on their heads, but shorter than those of the preceding, and whose back shows but a faint sketch of the human face, and which have fewer spines, and those less sharp, always turn to that sort of butterfly, the upper wings of which are divided into segments, one of which is so long as to represent a tail, and whose under wings are folded over the upper part of the back. A careful observation will establish many more rules of this kind, which are not so perfect, as to be free from all exceptions; yet are of great use, as they teach us in general

Chrysalis.

Chrysalis. ral what sort of fly we are to expect from the chrysalis, of which we know not the caterpillar, and therefore can only judge from appearances.

These are the principal differences of the angular chrysalises; the round ones also have their different marks not less regular than those.

The greater number of the round chrysalises have the hinder part of their body of the figure of a cone; but the upper end, which ought to be its circular plane base, is usually bent and rounded into a sort of knee; this is usually called the head of the chrysalis; but there are also some of this kind, the head of which is terminated by a nearly plane surface: some of the creeping ten-legged caterpillars give chrysalises of this kind, which have each of them two eminences that seem to bring them towards the angular kind.

Among the angular chrysalises there are some whose colours seem as worthy our observation as the shapes of the others. Many of them appear superbly clothed in gold. These elegant species have obtained the name of *chrysalis* and *aurelia*, which are derived from Greek and Latin words, signifying gold; and from these all other bodies of the same kind have been called by the same names, though less, or not at all, entitled to them. As some kinds are thus gilded all over, so others are ornamented with this gay appearance in a more sparing manner, having only a few spots of it in different places on their back and belly. These obvious marks, however, are not to be depended upon as certain characters of distinction; for accidents in the formation of the chrysalis may alter them; and those which naturally would have been gilded all over, may be sometimes only so in part; and either these or the others may, by accident, be so formed, as to show nothing of this kind at all, but be only of a dusky brown. Those, however, which have neither silver nor gold to recommend them to your eyes, do not want other colours, and those beautifully variegated. Some of them are all over of an elegant green, as is the chrysalis of the fennel caterpillar; others of an elegant yellow; and some of a bright greenish tinge, variegated with spots of a shining black: we have a very beautiful instance of this last kind in the chrysalis of the elegant cabbage-caterpillar. The general colour of the chrysalis of the common butterflies, however, is brown.

Some are also of a fine deep black; and of these many are so smooth and glossy, that they are equal to the finest Indian japan. The common caterpillar of the fig-tree gives an instance of one of these most beautiful glossy ones; the caterpillar of the vine affords another of these fine black chrysalises.

The rounded chrysalises do not afford any thing of that variety of colouring so remarkably beautiful in the angular ones; they are usually of a dusky yellow, in different shades, and are often variously spotted with black: but these, as well as all other chrysalises, before they arrive at their fixed colour, pass through several other temporary ones; some being of a different colour when first produced from the caterpillar, from what they are a few days afterwards; and some varying so greatly, though only in degree, as not to be distinguishable, even by the most conversant eye, from what they were when first produced. The

green rough caterpillar of the cabbage has a chrysalis which is green at first; and from that gradually goes through all the shades of green to a faint yellow, which is its lasting colour; and one of the oak caterpillars yields a chrysalis beautifully spotted with red at its first appearance; but these spots change to brown for their fixed colour: the third day from their formation usually fixes their lasting colours; and if they are observed to turn black in any part after this time, it is a sign that they are dead or dying.

The several species of insects, as a fly, spider, and an ant, do not differ more evidently from one another in regard to appearance, than do a caterpillar, its chrysalis, and a butterfly produced from it; yet it is certain, that these are all the product of the same individual egg; and nothing is more certain, than that the creature which was for a while a caterpillar, is, after a certain time, a chrysalis, and then a butterfly. These great changes produced in so sudden a manner, seem like the *metamorphoses* recorded in the fables of the ancients; and indeed it is not improbable that those fables first took their origin from such changes.

The parts being distinguishable in the chrysalis, we easily find the difference of the species of the fly that is to proceed from it. The naked eye shows whether it be one of those that have, or of those that have not, a trunk; and the assistance of a microscope shows the antennæ so distinctly, that we are able to discern whether it belongs to the day or night class; and often to what genus, if not the very species: nay, in the plumose horned kinds, we may see, by the antennæ, whether a male or female phalæna, is to be produced from the chrysalis; the horns of the female being in this state evidently narrower, and appearing less elevated above the common surface of the body, than those of the male.

All these parts of the chrysalis, however, though seen very distinctly, are laid close to one another, and seem to form only one mass; each of them is covered with its own peculiar membrane in this state, and all are surrounded together by a common one; and it is only through these that we see them; or rather we see on these the figures of all the parts moulded within, and therefore it requires attention to distinguish them. The chrysalis is soft when first produced, and is wetted on the front with a viscous liquor; its skin, though very tender at first, dries and hardens by degrees; but this viscous liquor, which surrounds the wings, legs, &c. hardens almost immediately; and in consequence fastens all those limbs, &c. into a mass, which were before loose from one another: this liquor, as it hardens, loses its transparence, and becomes brown; so that it is only while it is yet moist that these parts are to be seen distinct.

It is evident from the whole, that the chrysalis is no other than a butterfly, the parts of which are hid under certain membranes which fasten them together; and when the limbs are arrived at their due strength, they become able to break through these membranes, and then expand and arrange themselves in their proper order.

The first metamorphosis, therefore, differs nothing from the second, except that the butterfly comes from the

Chrysalis. the body of the caterpillar in a weak state, with limbs unable to perform their offices, whereas it comes from the chrysalis perfect.

Hist. of Insects, vol. i. p. 2.—23. M. Reaumur has given us many curious observations on the structure and uses of the several coverings that attend the varieties of the caterpillar-kind in this state.

The creatures in general remain wholly immoveable in this state, and seem to have no business in it but a patient attendance on the time when they are to become butterflies; and this is a change that can happen to them, only as their parts, before extremely soft and weak, are capable of hardening and becoming firm by degrees, by the transpiration of that abundant humidity which before kept them soft: and this is proved by an experiment of M. Reaumur, who, inclosing some chrysalises in a glass tube, found, after some time, a small quantity of water at the bottom of it; which could have come there no other way, but from the body of the inclosed animal. This transpiration depends greatly on the temperature of the air; it is increased by heat, and diminished by cold; but it has also its peculiarities in regard to the several species of butterfly to which the chrysalis belongs.

According to these observations, the time of the duration of the animal in the chrysalis state must be, in different species, very different; and there is indeed this wide difference in the extremes, that some species remain only eight days in this state, and others eight months.

We know that the caterpillar changes its skin four or five times during its living in that state; and that all these skins are at first produced with it from the egg, lying closely over one another. It parts with, or throws off, all these one by one, as the butterfly, which is the real animal, all this time within, grows more and more perfect in the several first changes. When it throws off one, it appears in another skin exactly of the same form; but at its final change from this appearance, that is, when it throws off the last skin, as the creature within is now arrived at such a degree of perfection as to need no farther taking of nourishment, there is no farther need of teeth, or any of the other parts of a caterpillar. The creature, in this last change, proceeds in the very same manner as in all the former, the skin opening at the back, and the animal making its way out in this shape. If a caterpillar, when about to throw off this last skin, be thrown into spirits of wine, and left there for a few days, the membranes within will harden, and the creature may be afterwards carefully opened, and the chrysalis taken out, in which the form of the tender butterfly may be traced in all its lineaments, and its eyes, legs, &c. evidently seen. It is not necessary, however, to seize upon this exact time for proving the existence of the chrysalis or butterfly in the caterpillar: for if one of these animals be thrown into spirit of wine, or into vinegar, some days before that time, and left there for the flesh to harden, it may afterwards be dissected, and all the lineaments of the butterfly traced out in it; the wings, legs, antennæ, &c. being as evident here, and as large, as in the chrysalis.

It is very plain from this, that the change of the caterpillar into chrysalis is not the work of a moment; but is carrying on for a long time before, even from

the very hatching of the creature from the egg. The parts of the butterfly, however, are not disposed exactly in the same manner while in the body of the caterpillar, as when left naked in the form of the chrysalis: for the wings are proportionally longer and narrower, being wound up into the form of a cord; and the antennæ are rolled up on the head; the trunk is also twisted up and laid upon the head; but this in a very different manner from what it is in the perfect animal, and very different from that in which it lies within the chrysalis; so that the first formation of the butterfly in the caterpillar, by time arrives at a proper change of the disposition of its parts, in order to its being a chrysalis. The very eggs, hereafter to be deposited by the butterfly, are also to be found, not only in the chrysalis, but in the caterpillar itself, arranged in their natural, regular order. They are indeed in this state very small and transparent; but after the change into the chrysalis, they have their proper colour.

As soon as the several parts of the butterfly, therefore, are arrived at a state proper for being exposed to the more open air, they are thrown out from the body of the caterpillar surrounded only with their membranes; and as soon as they are arrived after this at a proper degree of strength and solidity, they labour to break through these thinner coverings, and to appear in their proper and natural form. The time of their duration in this state of chrysalis is very uncertain, some remaining in it only a few days, others several months, and some almost a year in appearance. But there is a fallacy in this that many are not aware of. It is natural to think, that as soon as the creature has inclosed itself in its shell, be that of what matter it will, it undergoes its change into the chrysalis state. And this is the case with the generality: yet there are some which are eight or nine months in the shell before they become chrysalises, so that their duration in the real chrysalis state is much shorter than it naturally appears to be. M. Reaumur carefully watched the auriculated caterpillar of the oak in its several changes, and particularly from its chrysalis, which is of this last kind, into the fly; and has given an account of the method of this, as an instance of the general course of nature in these operations.

The membranes which envelope the creature in this chrysalis state are at first tough and firm, and immediately touch the several parts of the inclosed animal; but by degrees, as these parts harden, they become covered, some with hairs, and others with scales. These, as they continue to grow, by degrees fall off the several particular membranes which cover the parts on which they are placed, to a greater distance, and by degrees loosen them from the limbs. This is one reason why those membranes dry and become brittle.

The middle of the upper part of the *CORSELET* is usually marked with a line which runs in a longitudinal direction; and this part is always more elevated than the rest, even in the conic kinds, which are no otherwise angular. This line is in some very bold and plain; in others, it is so faint as not to be distinguishable without glasses; but it is always in the midst of that line that the shell begins to open. The motion of the head

Chrysalis. head of the butterfly backwards first occasions this crack: and a few repetitions of the same motion open it the whole length of the line.

The clearing itself, however, entirely is a work of more time in this case, than is the passing of the chrysalis out of the body of the caterpillar. In that case there is a crack sufficiently large in the skin of the back, and the whole chrysalis being loose comes out at once. But in this case, every particular limb, and part of the body, has its separate case; and these are almost inconceivably thin and tender, yet it is necessary that every part be drawn out of them before it appear naked to the open air. As soon as all this is effected, and the animal is at full liberty, it either continues some time upon the remains of its covering, or creeps a little way distant from it, and there rests. The wings are what we principally admire in this creature. These are at this time so extremely folded up, and placed in so narrow a compass, that the creature seems to have none at all: but they by degrees expand and unfold themselves; and finally, in a quarter of an hour, or half an hour at the utmost, they appear at their full size, and in all their beauty. The manner of this sudden unfolding of the wings is this: the small figure they make when the creature first comes out of its membranes, does not prevent the observing that they are at that time considerably thick. This is owing to its being a large wing folded up in the nicest manner, and with folds so arranged as to be by no means sensible to the eye, for the wing is never seen to unfold; but, when observed in the most accurate manner, seems to grow under the eye to this extent. When the creature is first produced from the shell, it is everywhere moist and tender; even its wings have no strength or stiffness till they expand themselves; but they then dry by degrees, and, with the other parts, become rigid and firm. But if any accident prevents the wings from expanding at their proper time, that is, as soon as the creature is out of its shell, they never afterwards are able to extend themselves; but the creature continues to wear them in their contracted and wholly useless state; and very often, when the wings are in part extended before such an accident happens, it stops them in a partial extension, and the creature must be contented to pass its whole life with them in that manner.

M. Reaumur has proved, that heat and cold make great differences in the time of hatching the butterfly from its chrysalis state: and this he particularly tried with great accuracy and attention, by putting them in vessels in warm rooms, and in ice-houses; and it seemed wholly owing to the hastening or retarding the evaporation of the abundant humidity of the animal in the chrysalis state, that it sooner or later appeared in the butterfly form. He varnished over some chrysalises, in order to try what would be the effect of thus wholly preventing their transpiration; and the consequence was, that the butterfly came forth from these two months later than their natural time. Thus was the duration of the animal in this state lengthened; that is, its existence was lengthened: but without any advantage to the creature, since it was in the time of its state of inaction, and probably of insensibility.

Though this was of no consequence, M. Reaumur deduces a hint from it that seems to be of some use.

He observes, that hen's eggs, of which we make so many uses, and eat in so many forms, are properly a sort of chrysalis of the animal; their germ, after they are impregnated by the cock, containing the young animal alive; and waiting only a due degree of warmth to be hatched, and appear in its proper form. Eggs transpire notwithstanding the hardness of their shells; and when they have been long kept, there is a road found near one of their ends, between the shell and the internal membrane, which is a mark of their being stale, and is the effect of an evaporation of part of their humidity: and the same varnish which had been used to the chrysalis, being tried on eggs, was found to preserve them for two years, as fresh as if laid but the same day, and such as the nicest palate could not distinguish from those that were so. See EGGS.

It is not yet known how much farther this useful speculation might be carried, and whether it might not be of great use even to human life, to invent something that should act in the manner of this varnish, by being rubbed over the body, as the *athlete* did of old, and the savages of the West Indies do at this time, without knowing why. But to return to the insects which are the subjects of this article; their third state, that in which they are winged, is always very short, and seems destined for no other action but the propagation of the species. See ENTOMOLOGY *Index*.

CHRYSANTHEMUM, CORN-MARIGOLD: A genus of the polygama superflua order, belonging to the syngenesia class of plants. See BOTANY *Index*.

CHRYSSES, the priest of Apollo, father of Astynome, called from him *Chryseis*. When Lyrnessus was taken, and the spoils divided among the conquerors, Chryseis fell to the share of Agamemnon. Chryses upon this went to the Grecian camp to solicit his daughter's restoration; and when his prayers were fruitless, he implored the aid of Apollo, who visited the Greeks with a plague, and obliged them to restore Chryseis.

CHRYSIPPUS, a Stoic philosopher, born at Solos in Cilicia, was disciple to Cleanthus, Zeno's successor. He wrote many books, several of which related to logic. None of the philosophers spoke in stronger terms of the fatal necessity of every thing, nor more pompously of the liberty of man, than the Stoics, Chrysippus in particular. He was so considerable among them, as to establish it into a proverb, that if it had not been for Chrysippus, the porch had never been. Yet the Stoics complained, as Cicero relates, that he had collected so many arguments in favour of the sceptical hypothesis, that he could not answer them himself; and thus had furnished Carneades, their antagonist, with weapons against them. There is an apophthegm of this philosopher preserved, which does him honour. Being told that some persons spoke ill of him, "It is no matter (said he), I will live so that they shall not be believed."

CHRYSIS, or GOLDEN-FLY. See ENTOMOLOGY *Index*.

CHRYSITRIX. See BOTANY *Index*.

CHRYSOBALANUS, COCOA PLUM. See BOTANY *Index*.

CHRYSOCOMA, GOLDBY-LOCKS. See BOTANY *Index*.

CHRYSOGONUM. See BOTANY *Index*.

CHRYSOLARUS,

Chrysanthemum
||
Chryfogonum.

Chrysolarius
||
Chrysolarius
||
Chrysolarius

CHRYSOLARUS, EMANUEL, one of those learned men in the 14th century who brought the Greek literature into the west. He was a man of rank; and descended from an ancient family, said to have removed with Constantine from Rome to Byzantium. He was sent into Europe by the emperor of the east to implore the assistance of Christian princes. He afterwards taught at Florence, Venice, Pavia, and Rome; and died at Constantinople, in 1415, aged 47. He wrote a Greek grammar, and some other small pieces.

CHRYSOLITE, or **YELLOWISH-GREEN-TOPAZ**; a precious stone of a grass-green colour, found in the East Indies, Brazil, Bohemia, Saxony, Spain, in Auvergne and Bourbon in France, and in Derbyshire in England. Some are likewise found with volcanic lavas, as in the Vivarais, where some large lumps have been seen of 20 or 30 pounds weight; but it is remarkable, that some of these chrysolites are partly decomposed into an argillaceous substance. All chrysolites, however, are far from being of the same kind. The oriental is the same with the peridot, and differs only by its green hue from the sapphires, topazes, and rubies of the same denomination. This becomes electric by being rubbed; has a prismatic form of six, or sometimes of five, striated faces; and does not lose its colour or transparency in the fire, which the common chrysolite often does; becoming either opaque, or melting entirely in a strong heat. The instant it melts, it emits a phosphoric light like the basis of alum and gypseous spar: with borax it produces a thin colourless glass. Its specific gravity is between 3.600 and 3.700; according to Briffon it is 2.7821, or 2.6923; and that of the Spanish chrysolite 3.0989.

The substance of this precious stone is lamellated in the direction of the axis of its primitive form; but the chrysolite from Saxony is foliated in a perpendicular direction to the same axis. The chrysolite of the ancients was the same gem which is now called *topaz*, and the name, of itself, indicates that it ought to be so.—Pliny says that the colour of the chrysolite is yellow like gold.

CHRYSOLITE-PASTE, a kind of glass made in imitation of natural chrysolite, by mixing two ounces of prepared crystal with ten ounces of red-lead, adding 12 grains of crocus martis made with vinegar; and then baking the whole for 24 hours, or longer, in a well luted cucurbit.

CHRYSOMELA, a genus of insects belonging to the order of coleoptera. See *ENTOMOLOGY Index*.

CHRYSOPHYLLUM, or **BULLY-TREE**. See *BOTANY Index*.

CHRYSOPLENIUM, See *BOTANY Index*.

CHRYSOPRASUS, or **CHRYSOPRASIVUS**, the 10th of the precious stones mentioned in the Revelation, as forming the foundation of the heavenly Jerusalem. The chrysolite is by mineralogists reckoned to be a variety of the chrysolite, and by Cronstedt called the *yellowish green and cloudy topaz*. He conjectures that it may perhaps be the substance which serves as a matrix to the chrysolite; as those that he had seen were like the clear-veined quartz, called in Sweden *milk crystal*, which is the first degree of crystallization.

The chrysolite, according to M. Magellan, is of a green colour, deeper than the chrysolite, but with a yellowish tinge inclining to blue like the green leek.

M. Achard says that it is never found crystallized, and that it is semi-transparent. By others it is reckoned among the quartz, and its colour is supposed to be owing to the mixture of cobalt, as it gives a fine blue glass when melted with borax, or with fixed alkali. M. Achard, however, found the glass of a deep yellow when the fusion was made with borax; and that it really contains some calx of copper instead of cobalt. M. Dutens says, that some gold has been found in this kind of stone; but this last belongs in all probability, says M. Magellan, to another class of substances, viz. the vitreous spars.

To the latter belongs most probably the aventurine, whose colour is generally a yellow brown red; though sometimes it inclines more to the yellow, or greenish, than to the red. These stones are not quite transparent: some indeed shine with such a brilliancy, as to render them of considerable value, but they are very rare. The common aventurine is but an artificial glass of various colours, with which powder of gold has been mixed; and these imitated aventurines so frequently excel the native ones in splendour, that the esteem of the latter is now much lowered. With regard to the chrysolite, its name from *πρασινος*, shows it to be of a greenish-blue colour, like the leaves of a leek; it only differs from the chrysolite in its bluish hue.

CHRYSOSTOM, ST JOHN, a celebrated patriarch of Constantinople, and one of the most admired fathers of the Christian church, was born of a noble family at Antioch, about the year 347. He studied rhetoric under Libavius, and philosophy under Andragathus, after which he spent some time in solitude in the mountains near Antioch; but the austerities he endured having impaired his health, he returned to Antioch where he was ordained deacon by Meletius. Flavian, Meletius's successor, raised him to the office of presbyter five years after; when he distinguished himself so greatly by his eloquence, that he obtained the surname of *Golden Mouth*. Nectarius patriarch of Constantinople dying in 397, St Chrysostom, whose fame was spread throughout the whole empire, was chosen in his room by the unanimous consent of both the clergy and the people. The emperor Arcadius confirmed this election, and caused him to leave Antioch privately, where the people were very unwilling to part with him. He was ordained bishop on the 26th of February 398; when he obtained an order from the emperor against the Eunomians and Montanists; reformed the abuses which subsisted amongst his clergy; retrenched a great part of the expences in which his predecessors had lived, in order to enable him to feed the poor and build hospitals, and preached with the utmost zeal against the pride, luxury, and avarice of the great. But his pious liberty of speech procured him many powerful enemies. He differed with Theophilus of Alexandria, who got him deposed and banished; but he was soon recalled. After this, declaiming against the dedication of a statue erected to the empress, she banished him into Cucufus in Armenia, a most barren inhospitable place; afterwards, as they were removing him from Petyus, the soldiers treated him so roughly, that he died by the way, A. D. 407. The best edition of his works is that published at Paris in 1718, by Montfaucon.

CRYSTAL.

Chrysolite.

CRYSTAL. See CRYSTAL.

CHUB, or CHUBB, in *Ichthyology*. See CYPRINUS, *ICHTHYOLOGY Index*.

The resorts of this fish are easily found, for they are generally holes overshadowed by trees, and this fish will be seen floating in such almost on the surface of the water in a hot day in great numbers. They are but a poor fish for the table, and are very full of bones; but they entertain the angler very much, and are of the number of those that are easily taken.

CHUBB, THOMAS, a noted polemical writer, born at East Harnham, a village near Salisbury, in 1679. He was put apprentice to a glover at Salisbury, and afterwards entered into partnership with a tallow-chandler. Being a man of strong natural parts, he employed all his leisure in reading; and though a stranger to the learned languages, became tolerably versed in geography, mathematics, and other branches of science. His favourite study was divinity; and he formed a little society for the purpose of debating upon religious subjects, about the time that the Trinitarian controversy was so warmly agitated between Clarke and Waterland. This subject, therefore, falling under the cognizance of Chubb's theological assembly, he at their request drew up and arranged his sentiments on it, in a kind of dissertation; which was afterwards published under the title of *The Supremacy of the Father asserted*, &c. In this piece Mr Chubb showed great talents in reasoning, and acquired so much reputation, that the late Sir Joseph Jekyll, master of the rolls, took him into his family to enjoy his conversation: but though he is said to have been tempted to remain with him by the offer of a genteel allowance, he did not continue with him many years; but chose to return to his friends at Salisbury. He published afterwards a 4to volume of tracts, which Mr Pope informs his friend Gay, he "read through with admiration of the writer, though not always with approbation of his doctrine." He died a single man in the 68th year of his age, and left behind him two vols. of posthumous tracts, in which he appears to have had little or no belief in revelation. But however licentious his way of thinking may be deemed, nothing irregular or immoral has been fairly imputed to him in his life and actions.

CHUDLEIGH, LADY MARY, was born in 1656, and married to Sir George Chudleigh, Baronet, by whom she had several children: her poems and essays have been much admired for delicacy of style. She died in 1710; and is said to have written several dramatic pieces, which, though not printed, are preserved in the family.

CHUPMESSAHITES, a sect among the Mahometans, who believe that Jesus Christ is God, and the true Messiah, the Redeemer of the world; but without rendering him any public or declared worship. The word in the Turkish language signifies *Protector of the Christians*. Ricaut says, there are abundance of these Chupmessahites among the people of fashion in Turkey, and some even in the seraglio.

CHURCH, has different significations, according to the different subjects to which it is applied.

1. It is understood of the collective body of Christians, or all those over the face of the whole earth who profess to believe in Christ, and acknowledge him

to be the Saviour of mankind. This is what the ancient writers call the *catholic* or *universal church*. Sometimes the word church is considered in a more extensive sense, and divided into several branches; as the church militant, is the assembly of the faithful on the earth; the church triumphant, that of the faithful already in glory; to which the Papists add the church patient; which, according to their doctrines, is that of the faithful in purgatory.

2. Church is applied to any particular congregation of Christians, who associate together and concur in the participation of all the institutions of Jesus Christ, with their proper pastors and ministers. Thus we read of the church of Antioch, the church of Alexandria, the church of Thessalonica, and the like.

3. Church denotes a particular sect of Christians distinguished by particular doctrines and ceremonies. In this sense, we speak of the Romish church, the Greek church, the Reformed church, the church of England, &c.

The Latin or Western church, comprehends all the churches of Italy, France, Spain, Africa, the north, and all other countries whither the Romans carried their language. Great Britain, part of the Netherlands, of Germany, and of the North, have been separated from hence ever since the time of Henry VIII; and constitute what we call the Reformed Church, and what the Romanists call the western schism.

The Greek, or Eastern church, comprehends the churches of all the countries anciently subject to the Greek or eastern empire, and through which their language was carried; that is, all the space extended from Greece to Mesopotamia and Persia, and thence into Egypt. This church has been divided from the Roman ever since the time of the emperor Phocas.

The Gallican church, denotes the church of France, under the government and direction of their respective bishops and pastors. This church has always enjoyed certain franchises and immunities; not as grants from popes, but as derived to her from her first original, and which she has taken care never to relinquish. These liberties depend upon two maxims; the first, that the pope has no authority or right to command or order any thing, either in general or in particular, in which the temporalities and civil rights of the kingdom are concerned; the second, that, notwithstanding the pope's supremacy is owned in cases purely spiritual, yet in France his power is limited and regulated by the decrees and canons of ancient councils received in that realm.

4. The word *church* is used to signify the body of ecclesiastics, or the clergy, in contradistinction to the laity. See CLERGY.

5. Church is used for the place where a particular congregation or society of Christians assemble for the celebration of divine service. In this sense churches are variously denominated, according to the rank, degree, discipline, &c. as Metropolitan church, Patriarchal church, Cathedral church, Parochial church, Collegiate church, &c. See METROPOLIS, PATRIARCH, &c.

In ecclesiastical writers, we meet with *grand church*, for the chief church of a place; particularly in the Greek liturgy, for the church of St Sophia at Constantinople, the see of the patriarch, founded by Constantine,

Churches. stantine, and consecrated under Justinian. It was at that time so magnificent, that Justinian is said to have cried out in the consecration thereof, *Ενίκησα σε, Σολομων; I have outdone thee, Solomon,* The dome, which is said to have been the first that was built, is 330 feet diameter.

The first church publicly built by the Christians, some authors maintain to be that of St Saviour at Rome founded by Constantine; others contend, that several churches abroad, called by the name of *St Peter Vivus*, were built in honour of that apostle during his lifetime.

CHURCH, with regard to architecture, Daviler defines a large oblong edifice, in form of a ship, with nave, choir, aisles, chapel, belfry, &c. See each part under its proper head.

CHURCH, *Simple*, is that which has only a nave and a choir.

CHURCH with Aisles, that which has a row of porticoes, in form of vaulted galleries, with chapels in its circumference.

CHURCH in a Greek cross, that where the length of the traverse part is equal to that of the nave; so called because most of the Greek churches are built in this form.

CHURCH in a Latin cross, that whose nave is longer than the cross part, as in most of the Gothic churches.

CHURCH in Rotundo, that whose plan is a perfect circle, in imitation of the Pantheon.

For the form of the ancient Greek churches, when they had all their parts, it was as follows: first was a porch, or portico, called the *vaunt-nave*, *προναος*; this was adorned with columns on the outside, and on the inside surrounded with a wall; in the middle whereof was a door, through which they passed into a second portico. The first of these porticoes was destined for the *energumeni*, and penitents in the first stage of their repentance; the second was much longer, destined for penitents of the second class, and the catechumens, and hence called *ναβος*, *ferula*, because those placed in it began to be subject to the discipline of the church. These two porticoes took up about one third of the space of the church. From the second portico they passed into the nave, *ναος*, which took up near another third of the church. In the middle, or at one side of the nave, was the ambo, where the deacons and priests read the gospel and preached. The nave was destined for the reception of the people, who here assisted at prayers.

Near the entrance of this was the baptistery or font. Beyond the nave was the choir, *χορος*, set with seats, and round: the first seat on the right, next the sanctuary, being for the chantor, or *choragus*.

From the choir they ascended by steps to the sanctuary, which was entered at three doors. The sanctuary had three apses in its length; a great one in the middle, under which was the altar, crowned with a baldachin, supported by four columns. Under each of the small apses, was a kind of table or cupboard, in manner of a beaufet.

Though, of the Greek churches now remaining, few have all the parts above described, most of them having been reduced to ruins or converted into mosques.

HIGH-CHURCH was a denomination originally given to those otherwise called *Nonjurors*, who refused to ac-

knowledge the title of William III. to the crown of Great Britain, under a notion that James II. though excluded, was still their rightful sovereign. This appellation was given them, because they entertained high notions of the dignity and power of the church, and the extent of its prerogative and jurisdiction. And those, on the contrary, were called *low-church men*, who disapproved of the secession and obstinacy of the nonjurors, distinguished themselves by their moderation toward dissenters, and were less ardent in extending the limits of church authority. The denomination of *high-church men* is now more generally applied to all who form pompous and ambitious conceptions of the authority and jurisdiction of the church, and who would raise it to an absolute independence on all human power.

CHURCH-Ale. See *WHITSUN-Ale*.

CHURCH Reeves, the same with *CHURCH-Wardens*.

CHURCH-Scot, or *Churchesfet*, a payment or contribution, by the Latin writers frequently called *primitiæ seminum*; being, at first, a certain measure of wheat, paid to the priest on St Martin's day, as the first fruits of harvest. This was enjoined by the laws of King Malcolm IV. and Canute, c. 10. But after this, *Church-scot* came to signify a reserve of corn-rent paid to the secular priests, or to the religious; and sometimes was taken in so general a sense as to include poultry, or any other provision that was paid in kind to the religious. See *TITHES*.

CHURCH-Wardens (*ecclesiæ guardiani*), in the English ecclesiastical polity, are the guardians or keepers of the church, and representatives of the body of the parish. They are sometimes appointed by the minister, sometimes by the parish, sometimes by both together, as custom directs. They are taken, in favour of the church, to be, for some purposes, a kind of corporation at the common law; that is, they are enabled, by that name, to have a property in goods and chattels, and to bring actions for them, for the use and profit of the parish. Yet they may not waste the church goods, but may be removed by the parish, and then called to account by actions at common law: but there is no method of calling them to account but by first removing them; for none can legally do it but those who are put in their place. As to lands, or other real property, as the church, churchyard, &c. they have no sort of interest therein; but if any damage is done thereto, the parson only or vicar shall have the action. Their office also is to repair the church, and make rates and levies for that purpose: but these are recoverable only in the ecclesiastical courts. They are also joined with the overseers in the care and maintenance of the poor. They are to levy a shilling forfeiture on all such as do not repair to church on Sundays and holidays; and are empowered to keep all persons orderly while there; to which end it has been held that a church-warden may justify the pulling off a man's hat, without being guilty of either an assault or a trespass. There are also a multitude of other petty parochial powers committed to their charge by divers acts of parliament.

CHURCHILL, SIR WINSTON, the father of the great duke of Marlborough, was descended from an ancient and honourable family in Dorsetshire. He was born at Wotton Glanville in that county in 1610; and

Churches,
Churchill.

Churchill.

and educated at St John's college at Oxford. He engaged in the cause of his unfortunate sovereign Cha. I. for which he suffered severely in his fortune; and having married, while young, Elizabeth, the daughter of Sir John Drake of Ashe in Devonshire, she was forced to seek a refuge in her father's house, when Mr Churchill's misfortunes left him none that he could call his own; and there most of his children were born. After the restoration, he was elected a Burgess to serve in parliament for the borough of Weymouth; and, in 1669, his majesty was pleased to confer on him the honour of knighthood. The next year he was made one of the commissioners of claims in Ireland; and upon his return from thence, was constituted one of the clerks comptrollers of the green cloth: but writing a kind of political essay upon the History of England, which gave great offence to the parliament, he was, in 1678, dismissed from his post. He was, however, soon restored to it again; and lived to see his eldest surviving son raised to the peerage, and the rest of his children in a fair way to promotion. He died in 1688.

CHURCHILL, *John*, duke of Marlborough, and prince of the holy Roman empire, a most renowned general and statesman, was born at Ashe in Devonshire in 1650. He was eldest son of Sir Winston Churchill, who carried him to court while very young, and where he was particularly favoured by James duke of York, afterwards King James II. when only twelve years of age. In 1666, he was made an ensign of the guards during the first Dutch war; and afterwards improved himself greatly in the military art at Tangier. In 1672, Mr Churchill attended the duke of Monmouth, who commanded a body of auxiliaries in the French service, and was soon after made a captain in the duke's own regiment. At the siege of Nimwegen, which happened in that campaign, he distinguished himself so much that he was taken notice of by the celebrated Marshal Turenne, who bestowed on him the name of the *handsome Englishman*.—In 1673, he was at the siege of Maestricht, where he gained such applause, that the king of France made him a public acknowledgment of his service; and the duke of Monmouth, who had the direction of the attack, told King Charles II. that he owed his life to Mr Churchill's bravery. In 1681, he married Sarah daughter and co-heiress (with her sister the countess of Tyrconnel) of Richard Jennings Esq. of Sandrich, in Hertfordshire. The duke of York recommended him in a very particular manner to the king; who, in 1682, created him baron of Eyemouth in the county of Berwick, in Scotland, and made him colonel of the third troop of guards. A little after King James's accession, he was created Baron Churchill of Sandrich in the county of Hertford, and made brigadier-general of his majesty's army in the west; where, when the duke of Monmouth came to surprise the king's army while the earl of Feversham and the majority of the officers were in their beds, he kept the enemy in play, till the king's forces had formed themselves, and thereby saved the whole army. When James showed an intention of establishing the Catholic religion in Britain, Lord Churchill, notwithstanding the great obligations he owed him, thought it his duty to abandon the royal cause; but even then did not leave him

Churchill.

without acquainting him by letter with the reason of his so doing. Lord Churchill was graciously received by the prince of Orange; and was by him employed first to re-assemble the troop of guards at London, and afterwards to reduce some lately raised regiments, and to new-model the army; for which purpose he was invested with the rank and title of lieutenant-general. In 1689, he was sworn one of the privy council, and one of the gentlemen of the king's bed chamber; and on the 9th of April following, was raised to the dignity of earl of Marlborough in the county of Wilts. He assisted at the coronation of their majesties; and was soon after made commander in chief of the English forces sent over to Holland; and here he first laid the foundation of that fame which was afterwards spread over all Europe. In 1690, he was made general of the forces sent to Ireland; where he made the strong garrisons of Cork and Kinsale prisoners of war. The year following, King William showed the good opinion he had of his conduct, by sending him to Flanders to put all things in readiness, and to draw the army together before his arrival. In 1692, he was dismissed from all his employments; and, not long after, was with some other peers committed to the tower on an accusation of high treason; which, however, was afterwards found to be a false and malicious report, the authors of which were punished. Marlborough was soon restored to favour, and in 1698 was appointed governor to the earl of Gloucester; with this extraordinary compliment from King William, "My lord, make him but what you are, and my nephew will be all I wish to see him." The same day he was again sworn one of the privy council; and in July following was declared one of the lords justices of England, for the administration of the government, in which great trust he was three times successively in the king's absence. In 1701 he was appointed general of the foot, commander in chief of the English forces, and ambassador extraordinary and plenipotentiary at the Hague. Upon the accession of Queen Anne to the throne, he was elected into the order of the garter, declared captain-general of all her majesty's forces, and sent ambassador extraordinary and plenipotentiary to Holland. After several conferences about a war, he put himself at the head of the army, where all the other generals had orders to obey him. His exploits in the field have been taken notice of under the article BRITAIN, N^o 344—370: we shall therefore only take notice in this place of the rewards and honours conferred upon him for these exploits. After his first campaign he was created marquis of Blandford and duke of Marlborough, with a pension of 5000l. out of the post-office, to devolve for ever upon those enjoying the title of duke of Marlborough. In 1703, he met Charles III. late emperor, going to Spain, who presented him with a sword set with diamonds. In 1704, having forced the enemy's lines at Schellenberg, he received a letter of thanks from the emperor Leopold, written with his own hand; an honour seldom done to any but sovereign princes. After the battle of Blenheim, he received congratulatory letters from most of the potentates in Europe, particularly from the states-general, and from the emperor, who desired him to accept of the dignity of a prince of the empire, which with the queen's leave was conferred upon him

Churchill. by the title of *Prince of Mildenheim in the province of Suabia*. After the campaign was ended, he visited the court of Prussia, where he laid such schemes as suspended the disputes with the Dutch about King William's estate; which wise conduct caused the whole confederacy to acknowledge that he had done the greatest service possible to the common cause. Upon his return to England, the queen, to perpetuate his memory, granted the interest of the crown in the honour and manor of Woodstock and hundred of Wotton to him and his heirs for ever. In 1705 he made a tour to Vienna, upon an invitation of the emperor Joseph; who highly caressed him, and made him a grant of the lordship of Mildenheim. After the campaign of 1708, the speaker of the house of commons was sent to Brussels on purpose to compliment him; and on his return to England he was again complimented in the house of lords by Lord Chancellor Cowper. All his services, however, and all the honours conferred upon him, were not sufficient to preserve him from being disgraced. After the change of the ministry in 1710, his interest daily declined; and in 1712, on the first day of the new year, he was removed from all his places. Finding all arts used to render him obnoxious in his native country, he visited his principality of Mildenheim, and several towns in Germany; after which he returned to England, and arrived there on the day of the queen's death. After being welcomed by the nobility and foreign ministers, he attended on King George I. in his public entry through London, who appointed him captain-general, colonel of the first regiment of foot-guards, one of the commissioners for the government of Chelsea hospital, and master-general of the ordnance. Some years before his death, he retired from public business. He died at Windsor-lodge in 1722, aged 73; leaving behind him a very numerous posterity, allied to the noblest and greatest families in these kingdoms. Upon his demise all parties united in doing honour or rather justice to his merit, and his corpse was interred the 9th of August following, with all the solemnity due to a person who had deserved so highly of his country, in Westminster-abbey. The noble pile near Woodstock, which bears the name of Blenheim-house, may be justly styled his monument: but without pretending to the gift of prophecy, one may venture to foretel, that his glory will long survive that structure; and that so long as our histories remain, or indeed the histories of Europe, his memory will live and be the boast of Britain, which by his labours was raised to be the first of nations, as during the age in which he lived he was deservedly esteemed the first of men. If he had foibles, as these are inseparable from human nature, they were so hidden by the glare of his virtues as to be scarcely perceived, or were willingly forgotten. A certain parasite, who thought to please Lord Bolingbroke by ridiculing the avarice of the duke, was stopped short by his lordship; who said, "He was so very great a man, that I forget he had that vice."

Out of a variety of anecdotes and testimonies concerning this illustrious personage, collected in the new edition of the *Biographia Britannica*, the following selection may serve to illustrate more particularly his disposition and manners.

One of the first things which he did, when very

young, was to purchase a box to put his money in; an indication this of the economical, not to say avaricious, temper that accompanied him through life. Dr Joseph Warton relates, that, on the evening of an important battle, the duke was heard to chide his servant for having been so extravagant as to light four candles in his tent when Prince Eugene came to confer with him. Mr Tyers, on the other hand, mentioned a circumstance, which, if well founded, redounds to his grace's generosity; though in a different respect it is much to his discredit: It is, that during the rebellion 1715 he sent 10,000l. to the earl of Mar. We consider the story as only a traditional report, which has not in itself any great degree of probability; and therefore we are by no means convinced of its truth. The late Mr Richardson junior, the painter, hath recorded a pleasing instance of the duke's calmness of disposition; for which, indeed, he was always remarkable. "The duke of Marlborough (says the writer), riding out once with Commissary Marriot, near the commissary's house in the country, it began to rain, and the duke called for his cloak; Marriot having his put on by his servant immediately. The duke's servant not bringing the cloak, he called for it again; but the man was still puzzling about the straps and buckles. At last, it raining now very hard, the duke called again, and asked him, "what he was about that he did not bring his cloak?" "You must stay (grumbles the fellow), if it rains cats and dogs, till I can get at it." The duke only turned to Marriot and said, "I would not be of that fellow's temper." The duke of Marlborough (adds Mr Richardson) did by nature and constitution, what Seneca judged by philosophy ought to be done. *Quid est quare ego servi mei hilarius responsum, et contumaciorem vultum, flagellis et compedibus expiem?*

Dr Swift, in one of his letters to Stella, relates the following particulars concerning the duke of Marlborough. "I was early this morning with Secretary St John, and gave him a memorial to get the queen's letter for the first-fruits, who has promised to do it in a very few days. He told me 'he had been with the duke of Marlborough, who was lamenting his former wrong steps in joining with the Whigs, and said he was worn out with age, fatigue, and misfortunes.' I swear it pited me; and I really think they will not do well in too much mortifying that man, although indeed it is his own fault. He is covetous as hell, and ambitious as the prince of it: he would fain have been general for life, and has broken all endeavours for peace, to keep his greatness and get money. He told the queen 'he was neither covetous nor ambitious.' She said, 'if she could have conveniently turned about, she would have laughed, and could hardly forbear it in his face.' He fell in with all the abominable measures of the late ministry, because they gratified him for their own designs. Yet he has been a successful general, and I hope he will continue his command."

Various characters have been drawn of the duke of Marlborough; most of which we shall omit, as either already sufficiently known, or as not meriting particular notice. That which is given of him by Dr Swift, in his "History of the four last years of the queen," has all the malignity and meanness of a party pamphlet. It is even so foolish as to insinuate, that the duke's

Churchill. duke's military accomplishments were problematical, and that he was destitute of personal courage. Mr Macpherson's character of his grace is very elaborately composed, and displays no small degree of ability and penetration; though it is not, perhaps, entirely free from prejudice. The historian considers it as a fact, that Lord Churchill, at the time of the revolution, had a design of placing his unfortunate master King James II. a prisoner in the hands of his rival the prince of Orange. But this story must be regarded as wholly unworthy of credit. It is founded upon suggestions and informations so groundless, and even ridiculous, that it cannot deserve a formal refutation. On the other hand, Mr Macpherson has done justice to the duke of Marlborough's prosecution of the war in Flanders, and hath shown that he conducted it upon the principles of sound wisdom and good policy.

There are two testimonies to the honour of the duke's memory, by two celebrated noble writers, which cannot be passed over. One is by Lord Bolingbroke, in his letters on the Study and Use of History. Speaking of the consternation raised among the allies of the grand confederacy by the death of King William, and of the joy which that event gave to the French, his lordship observes, that "a short time showed how vain the fears of some and the hopes of others were. By his death, the duke of Marlborough was raised to the head of the army, and indeed of the confederacy: where he, a new, a private man, a subject, acquired, by merit and by management, a more deciding influence than high birth, confirmed authority, and even the crown of Great Britain, had given to King William. Not only all the parts of that vast machine, the grand alliance, were kept more compact and entire, but a more rapid and vigorous motion was given to the whole: and instead of languishing out disastrous campaigns, we saw every scene of the war full of action. All those wherein he appeared, and many of those wherein he was not then an actor, but abettor however of their action, were crowned with the most triumphant success. I take, with pleasure, this opportunity of doing justice to that great man, whose faults I knew, whose virtues I admired; and whose memory, as the greatest general, and as the greatest minister, that our country, or perhaps any other, has produced, I honour."

The other testimony to the duke's accomplishments is by the earl of Chesterfield, in his Letters to his Son. "Of all the men (says his lordship) that ever I knew in my life (and I knew him extremely well), the late duke of Marlborough possessed the graces in the highest degree, not to say engrossed them: and indeed he got the most by them; for I will venture (contrary to the custom of profound historians, who always assign deep causes for great events) to ascribe the better half of the duke of Marlborough's greatness and riches to those graces. He was eminently illiterate; wrote bad English, and spelled it still worse. He had no share of what is commonly called *parts*; that is, he had no brightness, nothing shining in his genius. He had, most undoubtedly, an excellent good plain understanding, with sound judgment. But these alone would probably have raised him but something higher than they found him, which was page to King James II.'s

queen. There the graces protected and promoted Churchill. him: for while he was an ensign of the guards, the duchess of Cleveland, then favourite mistress to King Charles II. struck by those very graces, gave him 5000l.; with which he immediately bought an annuity for his life of 500l. of my grandfather Halifax; which was the foundation of his subsequent fortune. His figure was beautiful; but his manner was irresistible by either man or woman. It was by this engaging graceful manner that he was enabled, during all his war, to connect the various and jarring powers of the grand alliance, and to carry them on to the main object of the war, notwithstanding their private and separate views, jealousies, and wrongheadednesses. Whatever court he went to (and he was often obliged to go himself to some testy and refractory ones), he as constantly prevailed, and brought them into his measures. The pensionary Heinsius, a venerable old minister, grown gray in business, and who had governed the republic of the United Provinces for more than 40 years, was absolutely governed by the duke of Marlborough, as that republic feels to this day. He was always cool; and nobody ever observed the least variation in his countenance: he could refuse more gracefully than other people could grant; and those who went away from him the most dissatisfied as to the substance of their business, were yet personally charmed with him, and in some degree comforted by his manner. With all his gentleness and gracefulness, no man living was more conscious of his situation, nor maintained his dignity better."

A perusal of the above passage will convince us of the frivolous turn of the earl of Chesterfield's mind. His lordship, in his zeal to exalt the duke of Marlborough's external accomplishments, either forgets or depreciates the far greater talents of which he was possessed. There is an observation upon the subject in the British Biography, with which we entirely concur. "That the duke of Marlborough (says the writer) was eminently distinguished by the gracefulness of his manners, cannot be questioned; but the earl of Chesterfield appears to have attributed too much to their influence, when he ascribes—the better half of the duke of Marlborough's greatness and riches to those graces. That the uncommon gracefulness of his manners facilitated his advancement, and contributed to the success of his negotiations, may readily be admitted; but surely it must have been to much higher qualities that he owed the esteem of King William and of Prince Eugene, his reputation throughout all Europe, and his many victories and conquests. It was not by a polite exterior that he obtained his laurels at Schellenberg, at Oudenarde, at Ramillies, and at Blenheim."

How much the duke of Marlborough has been celebrated by our poets, is well known by Addison's "Campaign;" and by Philip's "Blenheim." Mr Addison, in his Rosamond, has properly assumed another and voluntary occasion of paying a fine compliment to his grace's military exploits, and the glory by which they would be followed. Upon the duke's removal from his places, an ode was inscribed to him by Mr Somerville, animated with all the zeal of whiggish enthusiasm, and containing some passages that are truly poetical. Another ode, not much inferior in spirit,

Churchill. was addressed to his grace, on occasion of his embarking for Ostend in the year 1712.

The duke of Marlborough's Scots title of Baron Eyemouth, being to heirs male, died with himself; but his English title going to his daughters and their heirs-male, went into the Spencer family, who retain their own surname of Spencer.

CHURCHILL, *Charles*, a celebrated satirist, the son of Mr Charles Churchill, curate and lecturer of St John's, Westminster, was educated at Westminster school, and received some applause for his abilities from his tutors in that famous seminary. His capacity, however, was greater than his application, so that he acquired the character of a boy that could do good if he would. As the slightest accounts of persons so noted are agreeable, it may not be amiss to observe, that having one day got an exercise to make, and from idleness or inattention having failed to bring it at the time appointed, his master thought proper to chastise him with some severity, and even reproached his stupidity: what the fear of stripes could not effect, the fear of shame soon produced, and he brought his exercise the next day, finished in such a manner, that he received the public thanks of all the masters. Still, however, his progress in the learned languages was but slow; nor is it to be wondered at, if we consider how difficult it was for a strong imagination, such as he was possessed of, to conform and walk tamely forward in the trammels of a school education: minds like his are ever starting aside after new pursuits; desirous of embracing a multiplicity of amusing objects; eager to come at an end, without the painful investigation of the means. In short, for want of proper skill in these languages, he was rejected from Oxford, whither his father had sent him; and probably this might have given occasion to the frequent invectives we find in his works against that most respectable university. Upon his return from thence, he again applied to his studies in Westminster school, where, at 17 years of age, he contracted an intimacy with a lady, to whom he was married, and their mutual regard for each other continued for several years. At the usual age of going into orders, Mr Churchill was ordained by the late bishop of London, and obtained a small curacy in Wales of 30*l.* a-year. Thither he carried his wife; they took a small house; and he passed through the duties of his station with assiduity and cheerfulness. Happy had it been for him had he continued there to enjoy the fruits of piety, peace, and simplicity of manners. He was beloved and esteemed by his parishioners; and though his sermons were rather above the level of his audience, they were commended and followed. But endeavouring to advance his fortune, by keeping a cyder cellar, it involved him in difficulties which obliged him to leave Wales and come to London. His father dying soon after, he stepped into the church in which he had officiated; and in order to improve his income, which scarcely produced 100*l.* a-year, he taught young ladies to read and write English at a boarding-school, kept by Mrs Dennis, where he behaved with that decency and decorum which became his profession. His method of living, however, bearing no proportion to his income, he contracted several debts in the city; which being unable to pay, a jail, the terror of indi-

gent genius, seemed ready to complete his misfortunes; but from this state of wretchedness he was relieved by the benevolence of Mr Lloyd, father to the poet of that name. Meanwhile, Mr Lloyd, the son, wrote a poetical epistle called the *Astor*, which being read and approved by the public, gave the author a distinguished place among the writers of his age. This induced Mr Churchill to write the *Rosciad*. It first came out without the author's name; but the justness of the remarks, and the severity of the satire, soon excited public curiosity. Though he never disowned his having written this piece, and even openly gloried in it; yet the public, unwilling to give so much merit to one alone, ascribed it to a combination of wits; nor were Messrs Lloyd, Thornton, or Colman, left unnamed upon this occasion. This misplaced praise soon induced Mr Churchill to throw off the mask, and the second edition appeared with his name at full length. As the *Rosciad* was the first of this poet's performances, so many are of opinion that it is the best. In it we find a very close and minute discussion of the particular merit of each performer; their defects pointed out with candour, and their merits praised without adulation. This poem, however, seems to be one of those few works which are injured by succeeding editions; when he became popular, his judgment began to grow drunk with applause; and we find, in the later editions, men blamed whose merit was incontestable, and others praised that were at that time in no degree of esteem with the judicious. His next performance was his *Apology to the Critical Reviewers*. This work is not without its peculiar merit; and as it was written against a set of critics whom the world was willing enough to blame, the public read it with their usual indulgence. In this performance he showed a particular happiness of throwing his thoughts, if we may so express it, into poetical paragraphs; so that the sentence swells to the break or conclusion, as we find in prose.

But while his writings amused the town, his actions disgusted it. He now quitted his wife, with whom he had cohabited many years; and resigning his gown and all clerical functions, commenced a complete *man of the town*, got drunk, frequented stewes; and, giddy with false praise, thought his talents a sufficient atonement for all his follies. In some measure to palliate the absurdities of his conduct, he now undertook a poem called *Night*, written upon a general subject indeed, but upon false principles; namely, that whatever our follies are, we should never attempt to conceal them. This, and Mr Churchill's other poems, being shown to Dr Johnson, and his opinion being asked, he allowed them but little merit; which being told to the author, he resolved to requite this private opinion with a public one. In his next poem, therefore, of the *Ghost*, he has drawn this gentleman under the character of Pomposo; and those who disliked Mr Johnson allowed it to have merit. Mr Johnson's only reply to Churchill's abuse was, "that he thought him a shallow fellow in the beginning, and could say nothing worse of him still." The poems of *Night* and the *Ghost* had not the rapid sale the author expected; but his *Prophecy of Famine* soon made ample amends for the late paroxysm in his fame. In this piece, written in the spirit of the famous North Briton,

Churching
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Churning.

ton, he exerted his virulent pen against the whole Scottish nation, adopting the prejudices of the mob, and dignifying scurrility by the aid of a poetic imagination. It had a rapid and extensive sale, as prophesied by Mr Wilkes; who said before its publication that he was sure it must take, as it was at once personal, poetical, and political. After its appearance, it was asserted by his admirers, that Mr Churchill was a better poet than Pope. This exaggerated adulation, as it had before corrupted his morals, began now to impair his mind: several succeeding pieces were published, which, being written without effort, are read without pleasure. His *Gotham, Independence, The Times*, seem merely to have been written by a man who desired to avail himself of the avidity of the public curiosity in his favour, and are rather aimed at the pockets than the hearts of his readers. Mr Churchill died in 1764, of a miliary fever, with which he was seized at Boulogne in France, whither he had gone on a visit to Mr Wilkes. After his death his poems were collected and printed together in two volumes 8vo.

CHURCHING OF WOMEN AFTER CHILD-BIRTH, took its rise from the Jewish rite of purification. In the Greek church it was limited to the 40th day after delivery; but in the western parts of Europe no certain time was observed. There is an office in the liturgy for this purpose.

CHURCHYARD, a piece of ground adjoining to a church, set apart for the interment or burial of the dead.—In the church of Rome they are blessed or consecrated with great solemnity. If a churchyard, which has been thus consecrated, shall afterwards be polluted by any indecent action, or profaned by the burial of an infidel, a heretic, an excommunicated or unbaptized person, it must be *reconciled*; and the ceremony of the reconciliation is performed with the same solemnity as that of the blessing or consecration.

CHURCHYARD, *Thomas*, a poet who flourished in the reigns of Henry VIII. Edward VI. Queen Mary, and Queen Elizabeth, was born at Shrewsbury; and inherited a fortune, which he soon exhausted in a fruitless attendance on the court, by which he only gained the favour of being retained a domestic in the family of Lord Surrey; when, by his lordship's encouragement, he commenced poet. Upon his patron's death, he betook himself to arms; was in many engagements; was frequently wounded, and was twice made prisoner. He published 12 pieces, which he afterwards printed together in one volume, under the title of *Churchyard's Chips*; and also the tragedy of *Thomas Moubray* duke of Norfolk. He died in 1570.

CHURLE, CEORLE, or CARL, in the Saxon times, signified a tenant at will, who held of the thanes or nobles on condition of rent and service. They were of two sorts: one rented the estate like our farmers; the other tilled and manured the demesnes, and were called ploughmen. See CEORLE.

CHURNING, in country affairs, the operation of making butter by agitating milk in a well known vessel called a *churn*. For accelerating this operation, a correspondent in the Bath Society Papers recommends a little distilled vinegar to be poured into the churn; and the butter will be produced in an hour afterwards. He acknowledges, however, that his experiments have not as yet ascertained the exact quantity of the acid

which is necessary to the proper effect, nor the precise time of its being mixed with the cream. But he apprehends a table spoonful or two to a gallon of cream will be sufficient; nor would he recommend it to be applied till the cream has undergone some considerable agitation. His first trial was after the churning had been going forward half a day: whether he observed the same rule afterwards he does not say; but all his trials proved successful, the butter being uniformly obtained in about an hour after the mixture. See AGRICULTURE and CHEMISTRY *Index*.

CHUS, or *Chuscb*, (Bible). It is a tradition of an ancient standing, that the *Chus* of the Scriptures denotes *Ethiopia*, and *Chuschi* an *Ethiopian*: the Septuagint and Vulgate constantly translate it so; and in this they are followed by most interpreters, and by Josephus and Jerome. And yet what Bochart urges to the contrary is of no inconsiderable weight, from Ezekiel xxix. 10. in which the two opposite extremes of Egypt are designed; and therefore *Chus*, which is opposite to Syene, must be Arabia: but this is more strongly pointed out by Xenophon, by whom Ethiopia is said to be the south boundary of Cyrus's empire; and Herodotus distinguishes between the Ethiopians of Asia and Africa, conjoining the former with the Arabians.

CHYLE, in the animal economy, a milky fluid secreted from the aliments by means of digestion. See ANATOMY and CHEMISTRY *Index*.

CHYLIFICATION, the formation of the chyle, or the act whereby the food is changed into chyle.

The chyle has by some authors been thought to have a great resemblance in its nature and chemical analysis to milk. The subject, however, hath as yet been but little inquired into. See the article MILK.

CHYME, or CHYMUS, in the common signification of the word, denotes every kind of humour which is increased by concoction; under which notion it comprehends all the humours fit or unfit for preserving and nourishing the body, whether good or bad. It frequently imports the finest parts of the chyle, when separated from the fæces, and contained in the lacteal and thoracic duct.

CHYMISTRY. See CHEMISTRY.

CHYMOLOGI, an appellation given to such naturalists as have employed their time in investigating the properties of plants from their taste and smell.

CHYMOSIS, in *Medicine*, the act of making or preparing chyme. The word comes from *χυμος*, *sucus*, of *χυνω*, *fundo*, "I pour out." Chymosis, according to some, is the second of the concoctions made in the body; being a repeated preparation of the most impure and gross parts of the chyle, which being rejected by the lacteals, is imbibed by the meseraics, and thence carried to the liver, to be there elaborated, purified, and subtilized afresh. It is of this, according to Rogers, that the animal spirits are formed.

CHYMOSIS is also a distortion of the eye-lids, arising from an inflammation; also an inflammation of the tunica cornea in the eye.

CHYTLA, in antiquity, a liquor made of wine and oil, and sometimes used in divination.

CHYTRI, among the Athenians, a festival in honour of Bacchus and Mercury, kept on the 13th of the month Anthesterion.

CHYTRIUM,

Chus
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Chytri.

Chytrium
||
Cibdelo-
placia.

CHYTRIUM, in *Ancient Geography*, a place in Ionia, in which formerly stood Clazomene; the Clazomenians, through fear of the Persians, removing from the continent to an adjacent island (Pausanias). Alexander reduced the island, by a mole or causeway, to a peninsula.

CHYTRUS, in *Ancient Geography*, an inland town of Cyprus, to the north of Citium; famous for its excellent honey.

CIANUS SINUS, in *Ancient Geography*, a bay of Bithynia, named from the town and river Cius.

CIBALÆ, or **CIBALIS**, in *Ancient Geography*, a town of Pannonia Inferior, on an eminence, near the lake Hiulka, to the north-west of Sirmium; the country of the emperor Gratian, where he was brought up to rope-making: a place rendered famous for the surprisal and defeat of Licinius by Constantine.

CIBBER, **COLLEY**, a celebrated comedian, dramatic writer, and poet laureate to the king, was born at London in 1671. His father Caius Gabriel Cibber, was a native of Holstein, and a skilful statuary, who executed the basso relievo on the pedestal of the monument, and the two admired figures of lunatics over the piers of the gate to Bethlehem Hospital in Moorfields. Colley, who derived his Christian name from the surname of his mother's family, was intended for the church, but betook himself to the stage, for which he conceived an early inclination; and he was some time before he acquired any degree of notice, or even a competent salary. His first essay in writing, was the comedy of *Love's last Shift*, acted in 1695, which met with success; as did his own performance of the character of the fop in it. From that time, as he says himself, "My muse and my spouse were so equally prolific, that the one was seldom the mother of a child, but in the same year the other made me the father of a play. I think we had a dozen of each sort between us; of both which kinds some died in their infancy, and near an equal number of each were alive when we quitted the theatre." The *Careless Husband*, acted in 1704, met with great applause, and is reckoned his best play; but none was of more importance to him than the *Non-juror*, acted in 1717, and levelled against the Jacobites. This laid the foundation of the misunderstanding between him and Mr Pope, raised him to be the hero of the Dunciad, and made him poet-laureate in 1730. He then quitted the stage, except a few occasional performances; and died in 1757. Cibber neither succeeded in acting nor in writing tragedy; and his odes were not thought to partake of the genius or spirit he showed in his comedies.

His son *Theophilus*, also a comic actor after him, was born during a great storm in 1703; and after passing a life of extravagance, distrels, and perplexity, perished in another storm in 1758, in the passage between Dublin and England. Theophilus married the sister of Thomas Augustine Arne, the famous musical composer; who became a celebrated tragic actress, and whose honour was sacrificed to her husband's extravagance.

CIBDELOPLACIA, in *Natural History*; a genus of spars debated by a very large admixture of earth; they are opaque, formed of thin crusts, covering vegetables and other bodies, by way of incrustations.

Of this genus we have the following species: 1. A grayish-white one, with a rough surface. 2. A whitish brown one: both these are friable. 3. A hard, pale-brown kind, which is the osteocolla of the shops. 4. The whitish-gray kind, with a smooth surface: this is the unicornu fossil and ceratites of authors. 5. The whitish-brown corralloide kind.

CIBDELOSTRACIA, in *Natural History*, terrene spars, destitute of all brightness and transparency, formed into thin plates, and usually found coating over the sides of fissures, and other cavities of stones, with congeries of them of great extent, and of plain or botryoid surfaces.

Of these there are usually reckoned seven kinds: the first the hard, brownish-white cibdelostracium, found in Germany: the second is the hard, whitish cibdelostracium, with thin crusts, and a smoother surface, found also in the Harts-forest in Germany: the third is the hard, pale-brown cibdelostracium, with numerous very thin crusts, found in subterranean caverns in many parts of England as well as Germany: the fourth is the white, light, and friable cibdelostracium, found also in Germany, but very rarely in any part of England: the fifth is the light, hard, pale-brown cibdelostracium, with a smooth surface, found in almost all parts of the world: the sixth is the whitish, friable, crustaceous cibdelostracium, with a rougher surface, frequent in Germany and England; and the seventh is the brownish-white friable cibdelostracium, with a dusty surface, found in several parts of Ireland as well as Germany.

CIBORIA, in antiquity, the large husks of Egyptian beans, which are said to have been so large as to serve for drinking-cups: whence they had their name *ciborium*, signifying a cup, in the Egyptian language.

CIBORIUM, in ecclesiastical writers, the covering for the altar. This covering is supported by four high columns, and forms a kind of tent for the eucharist, in the Romish churches. Some authors call it *turris gestatoria*, and others *pyxis*; but the *pyxis* is properly the box in which the eucharist is preserved.

CIBUS FERALIS, in antiquity, an entertainment peculiar to a funeral; for which purpose, beans, parsley, lettuce, bread, eggs, lentils, and salts, were in use.

CICADA, the FROG HOPPER or FLEA-LOCUST, a genus of insects belonging to the order of hemiptera. See *ENTOMOLOGY Index*.

CICATRICULA, among natural historians, denotes a small whitish speck in the yolk of an egg, supposed to be the first rudiments of the future chick.

CICATRIX, in *Surgery*, a little seam or elevation of callous flesh rising on the skin, and remaining there after the healing of a wound or ulcer. It is commonly called a *scar*.

CICATRIZANTS, in *Pharmacy*, medicines which assist nature to form a cicatrix. Such are Armenian bole, powder of tutty, &c.

Cicatrizzants are otherwise called *escharotics*, *epulotics*, *incarnatives*, *agglutinants*, &c.

CICCA, in *Botany*, a genus of the tetrandria order, belonging to the monœcia class of plants. The male calyx is tetraphyllous; there is no corolla: the female calyx triphyllous; no corolla; four stiles; the capsule quadricoccus, or four-berried.

CICELY, in *Botany*, the English name of a species of

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stracia
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Cicer,
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of chaerophyllum. See CHÆROPHYLLUM, BOTANY Index.

CICERO, or CHICK-PEA. See BOTANY Index.

CICERO, MARCUS TULLIUS, the celebrated Roman orator, was born in the year of Rome 647, about 105 years before Christ. His father Marcus Tullius, who was of the equestrian order, took great care of his education, which was directed particularly with a view to the bar. Young Tully, at his first appearance in public, declaimed with such vehemence against Sylla's party, that it became expedient for him to retire into Greece; where he heard the Athenian orators and philosophers, and greatly improved both in eloquence and knowledge. Here he met with T. Pomponius, who had been his school-fellow; and who, from his love to Athens, and spending a great part of his days in it, obtained the surname of *Atticus*; and here they revived and confirmed that noted friendship which subsisted between them through life with so celebrated a constancy and affection. From Athens he passed into Asia; and after an excursion of two years came back again into Italy.

Cicero was now arrived at Rome; and, after one year more spent at the bar, obtained, in the next place, the dignity of questor. Among the causes which he pleaded before his questorship, was that of the famous comedian Roscius, whom a singular merit in his art had recommended to the familiarity and friendship of the greatest men in Rome. The questors were the general receivers or treasurers of the republic, and were sent annually into the provinces distributed to them, as they always were, by lot. The island of Sicily happened to fall to Cicero's share; and that part of it, for it was considerable enough to be divided into two provinces, which was called *Lilybæum*. This office he received, not as a gift, but a trust; and he acquitted himself so well in it, that he gained the love and admiration of all the Sicilians. Before he left Sicily, he made the tour of the island, to see every thing that was curious, and especially the city of Syracuse; where he discovered the tomb of Archimedes to the magistrates who were showing him the curiosities of the place, but who, to his surprise, knew nothing of any such tomb.

We have no account of the precise time of Cicero's marriage with Terentia; but it is supposed to have been celebrated immediately after his return from his travels to Italy, when he was about 30 years old. He was now disengaged from his questorship in Sicily, by which first step, in the legal gradation and ascent of public honours, he gained an immediate right to the senate, and an actual admission into it during life; and settled again in Rome, where he employed himself constantly in defending the persons and properties of its citizens, and was indeed a general patron. Five years were almost elapsed since Cicero's election to the questorship, which was the proper interval prescribed by law before he could hold the next office of ædile; to which he was now, in his 37th year, elected by the unanimous suffrages of all the tribes, and preferably to all his competitors. After Cicero's election to the ædileship, but before his entrance upon the office, he undertook the famed prosecution of C. Verres, the late prætor of Sicily, who was charged with many flagrant acts of injustice, rapine, and cruelty, during his tri-

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ennial government of that island. This was one of the most memorable transactions of his life, for which he was greatly and justly celebrated by antiquity, and for which he will, in all ages, be admired and esteemed by the friends of mankind. The result was, that, by his diligence and address, he so confounded Hortensius, though the reigning orator at the bar, and usually styled *the king of the forum*, that he had nothing to say for his client. Verres, despairing of all defence, submitted immediately, without expecting the sentence, to a voluntary exile; where he lived many years, forgotten and deserted by all his friends. He is said to have been relieved in this miserable situation by the generosity of Cicero; yet was proscribed and murdered after all by Mark Antony, for the sake of those fine statues and Corinthian vessels of which he had plundered the Sicilians.

After the usual interval of two years from the time of his being chosen ædile, Cicero offered himself a candidate for the prætorship; and, in three different assemblies convened for the choice of prætors, two of which were dissolved without effect, he was declared every time the first prætor by the suffrages of all the centuries. He was now in the career of his fortunes, and in sight, as it were, of the consulship, the grand object of his ambition; and therefore, when his prætorship was at an end, he would not accept any foreign province, the usual reward of that magistracy, and the chief fruit which the generality proposed from it. He had no particular love for money, nor genius for arms; so that those governments had no charms for him: the glory which he pursued was to shine in the eyes of the city as the guardian of its laws, and to teach the magistrates how to execute, and the citizens how to obey, them.

Being now in his 43d year, the proper age required by law, he declared himself a candidate for the consulship along with six competitors, L. Sulpicius Galba, L. Sergius Catilina, C. Antonius, L. Cassius Longinus, Q. Cornificius, and C. Licinius Sacerdos. The two first were patricians; the two next plebeians, yet noble; the two last the sons of fathers who had first imported the public honours into their families: Cicero was the only *new man*, as he was called, among them, or one of the equestrian rank. These were the competitors; and in this competition the practice of bribing was carried on as openly and as shamefully by Antonius and Catiline as it usually is at our elections in Britain. However, as the election approached, Cicero's interest appeared to be superior to that of all the candidates: for the nobles themselves, though always envious and desirous to depress him, yet out of regard to the dangers which threatened the city from many quarters, and seemed ready to burst out into a flame, began to think him the only man qualified to preserve the republic, and break the cabals of the desperate by the vigour and prudence of his administration. The method of choosing consuls was not by an open vote, but by a kind of ballot, or little tickets of wood distributed to the citizens, with the names of the several candidates inscribed upon each; but in Cicero's case the people were not content with this secret and silent way; but before they came to any scrutiny, loudly and universally proclaimed Cicero the first consul, so that, as he himself says, "he was not chosen

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by the votes of particular citizens, but the common suffrage of the city; nor declared by the voice of the crier, but of the whole Roman people."

Cicero had no sooner entered upon his office than he had occasion to exert himself against P. Servilius Rullus, one of the new tribunes, who had been alarming the senate with the promulgation of an agrarian law; the purpose of which was to create a decemvirate, or ten commissioners, with absolute power for five years over all the revenues of the republic, to distribute them at pleasure to the citizens, &c. These laws used to be greedily received by the populace, and were proposed therefore by factious magistrates as oft as they had any point to carry with the multitude against the public good; so that Cicero's first business was to quiet the apprehensions of the city, and to baffle, if possible, the intrigues of the tribune. Accordingly, in an artful and elegant speech from the rostra, he gave such a turn to the inclination of the people, that they rejected this law with as much eagerness as they had ever received one. But the grand affair of all, which constituted the glory of his consulship, and has transmitted his name with such lustre to posterity, was the skill he showed, and the unwearied pains he took, in suppressing that horrid conspiracy which was formed by Catiline and his accomplices for the subversion of the commonwealth. For this great service he was honoured with the glorious title of *pater patriæ*, "the father of his country," which he retained for a long time after.

Cicero's administration was now at an end; but he had no sooner quitted his office, than he began to feel the weight of that envy which is the certain fruit of illustrious merit. He was now, therefore, the common mark, not only of all the factious, against whom he had declared perpetual war, but of another party not less dangerous, the envious too, whose united spleen never left him from this moment till they had driven him out of that city which he had so lately preserved. Cicero, upon the expiration of his consulship, took care to send a particular account of his whole administration to Pompey, who was finishing the Mithridatic war in Asia, in hopes to prevent any wrong impressions there from the calumnies of his enemies, and to draw from him some public declaration in praise of what he had been doing. But Pompey being informed by Metellus and Cæsar of the ill humour that was rising against Cicero in Rome, answered him with great coldness, and instead of paying him any compliment, took no notice at all of what had passed in the affair of Catiline, upon which Cicero expostulates with him in a letter which is still extant.

About this time Cicero bought a house of M. Crassus on the Palatine-hill, adjoining to that in which he had always lived with his father, and which he is now supposed to have given up to his brother Quintius. The house cost him near 30,000l. and seems to have been one of the noblest in Rome. It was built about 30 years before by the famous tribune M. Livius Drusus; on which occasion we are told, that when the architect promised to build it for him in such a manner that none of his neighbours should overlook him; "But if you have any skill (replied Drusus), contrive it rather so that all the world may see what I am

doing." The purchase of so expensive a house raised some censure on his vanity; and especially as it was made with borrowed money. This circumstance he himself does not dissemble, but says merrily upon it, that "he was now plunged so deeply in debt, as to be ready for a plot, only that the conspirators would not trust him."

The most remarkable event that happened in this year, which was the 45th of Cicero's life, was the pollution of the mysteries of the *bona dea* by P. Clodius, which, by an unhappy train of consequences, involved Cicero in a great and unexpected calamity. Clodius had an intrigue with Cæsar's wife Pompeia, who, according to annual custom, was now celebrating in her house those awful sacrifices of the goddesses, to which no male creature ever was admitted, and where every thing masculine was so scrupulously excluded, that even pictures of that sort were covered during the ceremony. It flattered Clodius's imagination greatly to gain access to his mistress in the midst of her holy ministry; and with this view he dressed himself in a woman's habit, that by the benefit of his smooth face, and the introduction of one of the maids, he might pass without discovery; but by some mistake between him and his guide, he lost his way when he came within the house, and fell unluckily among the other female servants. Here he was detected by his voice, and the servants alarmed the whole company by their shrieks, to the great amazement of the matrons, who threw a veil over their sacred mysteries, while Clodius found means to escape. The story was presently spread abroad, and raised a general scandal and horror throughout the city. The whole defence which Clodius made when, by order of the senate, he was brought to a trial, was to prove himself absent at the time of the fact, for which purpose he produced two men to swear that he was then at Interamna, about two or three days journey from the city. But Cicero being called upon to give his testimony, deposed, that Clodius had been with him that very morning at his house in Rome. Irritated by this, Clodius formed a scheme of revenge. This was to get himself chosen tribune, and in that office to drive Cicero out of the city, by the publication of a law, which, by some stratagem or other, he hoped to obtrude upon the people. But as all patricians were incapable of the tribunate by its original institution, so his first step was to make himself a plebeian, by the pretence of an adoption into a plebeian house, which could not yet be done without the suffrage of the people. The first triumvirate was now formed, which was nothing else in reality but a traitorous conspiracy of three of the most powerful citizens of Rome, to extort from their country by violence what they could not obtain by law. Pompey's chief motive was to get his acts confirmed by Cæsar in his consulship, which was now coming on; Cæsar, by giving way to Pompey's glory, to advance his own; and Crassus, to gain that ascendance by the authority of Pompey and Cæsar, which he could not sustain alone. Cicero might have made what terms he pleased with the triumvirate, and been admitted even a partner of their power, and a fourth in their league; but he would not enter into any engagements with the three whose union he and all the friends of the republic abhorred. Clodius, in the mean time, had been pushing

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ing on the business of his adoption, which at last he effected, and began soon after to threaten Cicero with all the terrors of his tribunate, to which he was now advanced without any opposition. Both Cæsar and Pompey secretly favoured his scheme; not that they intended to ruin Cicero, but only to keep him under the lash; and if they could not draw him into their measures, or make him at least keep quiet, to let Clodius loose upon him. Cæsar, in particular, wanted to distress him so far as to force him to a dependence on himself; for which end, while he was privately encouraging Clodius to pursue him, he was proposing expedients to Cicero for his security. But though his fortunes seemed now to be in a tottering condition, and his enemies to gain ground daily upon him, yet he was unwilling to owe the obligation of his safety to any man, far less to Cæsar, whose designs he always suspected, and whose schemes he never approved. This stiffness in Cicero so exasperated Cæsar, that he resolved immediately to assist Clodius with all his power to oppress him; while Pompey was all the while giving him the strongest assurances that there was no danger, and that he would sooner be killed himself than suffer him to be hurt.

Clodius, in the mean time, was obliging the people with several new laws, contrived chiefly for their advantage; the design of all which was only to introduce, with a better grace, the ground-plot of the plan, the banishment of Cicero. In short, having caused a law to be enacted, importing, that any who had condemned a Roman citizen, unheard, should himself be banished, he soon after impeached Cicero upon it. It was in vain that this great man went up and down the city soliciting his cause in the habit of a suppliant, and attended by many of the first young noblemen whom he had taught the rules of eloquence; those powers of speaking which had so often been successful in defending the cause of others, seemed totally to forsake his own: he was banished by the votes of the people 400 miles from Italy; his houses were ordered to be demolished, and his goods set up to sale. It cannot be denied, that in this great calamity he did not behave himself with that firmness which might reasonably be expected from one who had borne so glorious a part in the republic; conscious of his integrity, and suffering in the cause of his country; for his letters are generally filled with such lamentable expressions of grief and despair, that his best friends, and even his wife, were forced sometimes to admonish him to rouse his courage, and remember his former character. Atticus was constantly putting him in mind of it; and sent him word of a report that was brought to Rome by one of Cassius's freed-men, that his affliction had disordered his senses. He was now indeed attacked in his weakest part; the only place in which he was vulnerable. To have been as great in affliction as he was in prosperity, would have been a perfection not given to man; yet his very weakness flowed from a source which rendered him the more amiable in all the other parts of his life; and the same tenderness of disposition which made him love his friends, his children, and his country, more passionately than other men, made him feel the loss of them more sensibly. When he had been gone a little more than two months, a motion was made in the senate by one of the tribunes,

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who was his friend, to recal him, and repeal the laws of Clodius, to which the whole house readily agreed. Many obstructions, as may be easily imagined, were given to it by the Clodian faction; but this made the senate only more resolute to effect it. They passed a vote, therefore, that no other business should be done till Cicero's return was carried; which at last it was, and in so splendid and triumphant a manner, that he had reason, he says, to fear, lest people should imagine that he himself had contrived his late flight for the sake of so glorious a restoration.

Cicero, now in his 50th year, was restored to his former dignity, and soon after to his former fortunes; satisfaction being made to him for the ruin of his estates and houses, which last were built up again by himself with more magnificence than before. But he had domestic grievances about this time which touched him very nearly, and which, as he signifies obscurely to Atticus, were of too delicate a nature to be expressed in a letter: They arose chiefly from the petulant humour of his wife, which began to give him frequent occasions of chagrin, and, by a series of repeated provocations, confirmed in him that settled disgust which at last ended in a divorce.

In the 56th year of his age, he was made proconsul of Cilicia, and his administration there gained him great honour. About this time the expectation of a breach between Cæsar and Pompey engaged the general attention. Crassus had been destroyed with his army some years before in the war with the Parthians; and Julia the daughter of Cæsar, whom Pompey married, and who, while she lived, was the cement of their union, was also dead in child-bed. Cæsar had put an end to the Gallic war, and reduced the whole province to the Roman yoke; but though his commission was near expiring, he seemed to have no thoughts of giving it up and returning to the condition of a private subject. He pretended that he could not possibly be safe if he parted with his army, especially while Pompey held the province of Spain prolonged to him for five years. This disposition to a breach Cicero soon learned from his friends, as he was returning from his province of Cilicia. But as he foresaw the consequences of a war more clearly and fully than any of them, so his first resolution was to apply all his endeavours and authority to the mediation of a peace; though, in the event of a breach, he was determined within himself to follow Pompey. He clearly foresaw, what he declared without scruple to his friends, that which side soever got the better, the war must necessarily end in a tyranny. The only difference, he said, was, that if their enemies conquered, they should be proscribed; if their friends, they would be slaves.

He no sooner arrived at the city, however, than he fell, as he tells us, into the very flame of civil discord, and found the war in effect proclaimed; for the senate had just voted a decree, that Cæsar should disband his army by a certain day, or be declared an enemy; and Cæsar's sudden march towards Rome effectually confirmed it. In the midst of all this hurry and confusion, Cæsar was extremely solicitous about Cicero; not so much to gain him, for that was not to be expected, as to prevail with him to stand neuter. He wrote to him several times to that effect and

Cicero. employed all their common friends to press him with letters on that subject; all which was done; but in vain, for Cicero was impatient to be gone to Pompey. In the mean time, these letters give us a most sensible proof of the high esteem and credit in which Cicero flourished at this time in Rome; when in a contest for empire, which force alone was to decide, we see the chiefs on both sides so solicitous to gain a man to their party, who had no peculiar skill in arms or talents for war. Pursuing, however, the result of all his deliberations, he embarked at length to follow Pompey, who had been obliged to quit Italy some time before, and was then at Dyrrhachium; and arrived safely in his camp with his son, his brother, and his nephew, committing the fortunes of the whole family to the issue of that cause. After the battle of Pharsalia, in which Pompey was defeated, Cicero returned into Italy, and was afterwards received into great favour by Cæsar, who was now declared dictator the second time, and Mark Antony his master of horse. We may easily imagine, what we find indeed from his letters, that he was not a little disconcerted at the thoughts of an interview with Cæsar, and the indignity of offering himself to a conqueror against whom he had been in arms; for though upon many accounts he had reason to expect a kind reception from Cæsar, yet he hardly thought his life, he says, worth begging, since what was given by a master might always be taken away again at pleasure. But at their meeting he had no occasion to say or do any thing that was below his dignity; for Cæsar no sooner saw him than he alighted, ran to embrace him, and walked with him alone, conversing very familiarly, for several furlongs.

Cicero was now in his 61st year, and forced at last to part with his wife Terentia, whose humour and conduct had been long uneasy to him. She was a woman of an imperious and turbulent spirit, and though he had borne her perverseness in the vigour of health, and flourishing state of his fortunes; yet, in a declining life, soured by a continual succession of mortifications from abroad, the want of ease and quiet at home was no longer tolerable to him. But he was immediately oppressed by a new and most cruel affliction, the death of his beloved daughter Tullia, who died in child-bed soon after her divorce from her third husband Dolabella. She was about 32 years old at the time of her death; and, by the few hints which are left of her character, appears to have been an excellent and admirable woman. She was most affectionately and piously observant of her father, and, to the usual graces of her sex, having added the more solid accomplishments of knowledge and polite letters, was qualified to be the companion and delight of his age; and was justly esteemed, not only as one of the best, but the most learned, of the Roman ladies. His affliction for the death of this daughter was so great, that to shun all company as much as he could, he removed to Atticus's house, where he lived chiefly in his library, turning over every book he could meet with on the subject of moderating grief. But finding his residence here too public, and a greater resort to him than he could bear, he retired to Asturia, one of his seats near Antium; a little island on the Latian shore, at the mouth of a river of the same name, cover-

ed with wood and groves cut into shady walks; a scene of all others the fittest to indulge melancholy, and where he could give a free course to his grief. "Here (says he to Atticus) I live without the speech of man; every morning early I hide myself in the thickest of the wood, and never come out till the evening. Next to yourself, nothing is so dear to me as this solitude; and my whole conversation is with my books." Indeed his whole time was employed in little else than reading and writing during Cæsar's administration, which he could never cheerfully submit to; and it was within this period that he drew up one of the gravest of those philosophical pieces which are still extant in his works.

Upon the death of Cæsar, Octavius his nephew and heir coming into Italy, was presented to Cicero by Hirtius and Pansa, with the strongest professions on the part of the young man that he would be governed entirely by his direction. Indeed Cicero thought it necessary to cherish and encourage Octavius, if for nothing else, yet to keep him at a distance from Antony; but could not yet be persuaded to enter heartily into his affairs. He suspected his youth and want of experience; and that he had not strength enough to deal with Antony; and, above all, that he had no good disposition towards the conspirators. He thought it impossible he should ever be a friend to them; and was persuaded rather, that if ever he got the upper hand, his uncle's acts would be more violently enforced, and his death more cruelly revenged, than by Antony himself. And when Cicero did consent at last to unite himself to Octavius's interests, it was with no other view but to arm him with a power sufficient to oppress Antony; yet so checked and limited, that he should not be able to oppress the republic.

In the hurry of all these politics, he was still prosecuting his studies with his usual application; and, besides some philosophical pieces, now finished his book of offices, or the duties of man, for the use of his son: A work admired by all succeeding ages as the most perfect system of Heathen morality, and the noblest effort and specimen of what reason could do in guiding man through life with innocence and happiness. However, he paid a constant attention to public affairs; missed no opportunities, but did every thing that human prudence could do for the recovery of the republic: for all that vigour with which it was making this last effort for itself, was entirely owing to his counsels and authority. This appears from those memorable Philippics which from time to time he published against Antony, as well as from other monuments of antiquity. But all was in vain; for though Antony's army was entirely defeated at the siege of Modena, which made many people imagine that the war was at an end, and the liberty of Rome established; yet the death of the consuls Pansa and Hirtius in that action gave the fatal blow to all Cicero's schemes, and was the immediate cause of the ruin of the republic.

Octavius having subdued the senate to his mind, marched towards Gaul to meet Antony and Lepidus; who had already passed the Alps, and brought their armies into Italy, in order to have a personal interview with him; which had been privately concerted for settling the terms of a triple league, and dividing the power and provinces of Italy among themselves.

Cicero. themselves. The place appointed for this interview was a small island about two miles from Bononia, formed by the river Rhenus which runs near that city. Here they met, and spent three days in a close conference to adjust the plan of their accommodation; and the last thing they adjusted was the list of a proscription which they were determined to make of their enemies. This, as the writers tell us, occasioned much difficulty and warm contests among them, till each in his turn consented to sacrifice some of his best friends to the revenge and resentment of his colleagues. Cicero was at his Tusculan villa, when he first received the news of the proscription, and of his being included in it. It was the design of the triumvirate to keep it a secret, if possible, to the moment of execution, in order to surprise those whom they had destined to destruction, before they were aware of their danger, or had time to make their escape. But some of Cicero's friends found means to give him early notice of it; upon which he set forward to the sea-side, with a design to transport himself out of the reach of his enemies. There, finding a vessel ready, he presently embarked; but the winds being adverse, and the sea uneasy to him, after he had sailed about two leagues along the coast, he was obliged to land, and spend the night on shore. From whence he was forced, by the importunity of his servants, on board again; but was soon afterwards obliged to land at a country-seat of his a mile from the shore, weary of life, and declaring he was resolved to die in that country which he had so often saved. Here he slept soundly for some time, till his servants once more forced him away in a litter towards the ship, having heard that he was pursued by Antony's assassins. They were scarce departed when the assassins arrived at his house; and, perceiving him to be fled, pursued him immediately towards the sea, and overtook him in a wood that was near the shore. Their leader was one Popilius Lenas, a tribune of the army, whose life Cicero had formerly defended and saved. As soon as the soldiers appeared, the servants prepared to defend their master's life at the hazard of their own; but Cicero commanded them to set him down and make no resistance. They soon cut off his head and his hands, returning with them to Rome as the most agreeable present to their cruel employer. Antony, who was then at Rome, received them with extreme joy, rewarding the murderer with a large sum of money, and ordered the head to be fixed upon the rostra between the two hands; a sad spectacle to the city, and what drew tears from every eye, to see those mangled members which used to exert themselves so gloriously from that place in defence of the lives, the fortunes, and the liberties of the Roman people, so lamentably exposed to the scorn of sycophants and traitors. The deaths of the rest, says an historian of that age, caused only a private and particular sorrow; but Cicero's an universal one. It was a triumph over the republic itself; and seemed to confirm and establish the perpetual slavery of Rome.

A modern writer*, however, is of opinion, that posterity has been too much seduced by the name of Cicero, and that better citizens were sacrificed to the jealousy of the triumvirs without exciting so much indignation. If we take an impartial survey of Cicero's conduct and principles, avowed in his own epistolary

correspondence, and trace him through all the labyrinths of his contradictory letters, we shall find more to blame than to admire; and discover, that the desire of advancing his fortunes, and making himself a name, were, from his outset in life, the only objects he had in view. The good of his country, and the dictates of stern steady virtue, were not, as in Brutus and Cato, the constant springs of his actions. The misfortunes that befel him after his consulship, developed his character, and showed him in his true colours; from that time to his death, pusillanimity, irresolution, and unworthy repining, tainted his judgment, and perplexed every step he wished to take. He flattered Pompey and cringed to Cæsar, while in his private letters he abused them both alternately. He acknowledges in a letter to his friend, the time-serving Atticus, that, although he was at present determined to support the cause of Rome and liberty, and to bear misfortune like a philosopher, there was one thing which would gain him over to the triumvirs, and that was their procuring for him the vacant augurship; so pitiful was the bribe to which he would have sacrificed his honour, his opinion, and the commonwealth. By his wavering imprudent conduct, he contributed greatly towards its destruction. After reproaching the conspirators for leaving him out of the secret, and loading them with the most flattering compliments on their delivering Rome from Cæsar's tyranny, he calls Casca an *assassin*, to pay his court to the boy Octavius, by whom he was completely duped. His praises of this triumvir are in the highest strain of panegyric. Mark Antony well knew, that the virulent abuse which Cicero was continually pouring out against him, was not an effusion of patriotic zeal or virtuous indignation, but merely the ebullitions of personal hatred. He therefore caused Cicero to be killed, as an angry man that has been stung, stamps on a venomous animal that comes within reach of his foot. The cloak he threw over the body of Brutus, and the speech he pronounced at the sight of that hero when dead, differ widely from the treatment he gave the remains of Cicero; and show, that he made a distinction between a Roman who opposed him from political motives, and one whose enmity arose from private pique.

Cicero's death happened on the 7th of December, in the 64th year of his age, about ten days from the settlement of the first triumvirate; and with him expired the short empire of eloquence among the Romans. As an orator he is thus characterized by Dr Blair. "In all his orations his art is conspicuous. He begins commonly with a regular exordium, and with much address prepossesses the hearers, and studies to gain their affections. His method is clear, and his arguments are arranged with exact propriety. In a superior clearness of method, he has an advantage over Demosthenes. Every thing appears in its proper place. He never tries to move till he has attempted to convince; and in moving, particularly the softer passions, he is highly successful. No one ever knew the force of words better than Cicero. He rolls them along with the greatest beauty and magnificence; and in the structure of his sentences is eminently curious and exact. He is always full and flowing, never abrupt. He amplifies every thing; yet though his manner is generally diffuse, it is often happily varied and accommodated to the subject. When

Cicero.

* Swinburne's Travels in Sicily, vol. ii. p. 502.

Cichorium
||
Cicuta.

an important public object roused his mind, and demanded indignation and force, he departs considerably from that loose and declamatory manner to which he at other times is addicted, and becomes very forcible and vehement. This great orator, however, is not without his defects. In most of his orations there is too much art, even carried to a degree of ostentation. He seems often desirous of obtaining admiration rather than of operating conviction. He is sometimes, therefore, showy rather than solid, and diffuse where he ought to have been urgent. His sentences are always round and sonorous. They cannot be accused of monotony, since they possess variety of cadence; but from too great a fondness for magnificence, he is on some occasions deficient in strength. Though the services which he had performed to his country were very considerable, yet he is too much his own panegyrist. Ancient manners, which imposed fewer restraints on the side of decorum, may in some degree excuse, but cannot entirely justify, his vanity."

CICHORIUM, SUCCORY. See BOTANY *Index*.

CICINDELA, the SPARKLER, in *Zoology*, a genus of insects belonging to the order of coleoptera. See ENTOMOLOGY *Index*.

CICISBEO, an Italian term, which in its etymology signifies a *whisperer*; a term bestowed in Italy both on lovers, and those who to outward appearance act as such, waiting on married ladies with as much attention and respect as if they were their lovers. This Italian custom has been spoken of very reproachfully by some writers: Mr Baretta has taken great pains to vindicate it. He ascribes it to a spirit of gallantry, derived from the ages of chivalry, and much heightened and refined by the revival of the Platonic philosophy in Italy, about the thirteenth century; and by the verses of Petrarch in compliment to the beautiful Laura, and his numerous imitators.

CICLUT, or CICLUCH, a strong frontier town of Dalmatia, situated on the river Narenta, in E. Long. 18. 22. N. Lat. 43. 29. It is surrounded with walls built in the ancient manner, and was taken by the Venetians from the Turks in 1604.

CICONES, a people of Thrace near the Hebrus. Ulysses at his return from Troy conquered them, and plundered their chief city Ismarus. They tore to pieces Orpheus for his obscene indulgencies.

CICUTA, properly signifies a hollow intercepted between two knots, of the stalks or reeds of which the ancient shepherds used to make their pipes. It is now, however, generally used to signify the water hemlock, and also the common fort; but Linnæus has described the latter under the old name of *Conium*. See that article.

There are three species of water-hemlock; the *virosa*, the *bulbifera*, and the *maculata*. Of these the first is the only one remarkable, and that for the poisonous qualities of its roots, which have been often known to destroy children who ate them for parsnips.

CICUTA is also used, chiefly among the ancients, for the juice or liquor expressed from the above plant, being the common poison wherewith the state criminals at Athens were put to death: Though some have suggested, that the poisonous draught to which the Athenians doomed their criminals was an inspissated

juice compounded of the juice of *cicuta* and some other corrosive herbs.

Socrates drank the *cicuta*.—Plato, in his dialogue on the immortality of the soul, observes, that "The executioner advised Socrates not to talk, for fear of causing the *cicuta* to operate too slowly." M. Petit, in his *Observations Miscellanæ*, remarks, that this advice was not given by the executioner out of humanity, but to save the *cicuta*; for he was only allowed so much poison per ann. which, if he exceeded, he was to furnish at his own expence. This construction is confirmed by a passage in Plutarch: the executioner who administered the *cicuta* to Phocion, not having enough, Phocion gave him money to buy more; observing by the way, "that it was odd enough, that at Athens a man must pay for every thing, even for his own death."

CID, RODERIGO DIAS LE, a Castilian officer, who was very successful against the Moors, under Ferdinand II. king of Castile; but whose name would hardly been remembered, if Corneille had not made his passion for Chimene the subject of an admired tragedy, founded on a simple but affecting incident. The Cid is desperately in love with Chimene, daughter of the count de Gomes; but he is at variance with the Count, and being challenged by him, kills him in a duel. The conflict between love and honour in the breast of Chimene, who at length pardons and marries the Cid, forms the beauty of the piece. He died in 1098.

CIDARIS, in antiquity, the mitre used by the Jewish high-priests. The Rabbins say, that the bonnet used by priests in general was made of a piece of linen cloth 16 yards long, which covered their heads like a helmet or turban; and they allow no other difference between the high-priest's bonnet and that of other priests, than that the one is flatter, and more in the form of a turban; whereas that worn by ordinary priests rose something more in a point.

CIGNANI, CARLO, an Italian painter, was born at Bologna in 1628; and was the disciple of Albani. He was esteemed by Pope Clement XI. who nominated him prince of the academy of Bologna, and loaded him with favours. Cignani died at Forli in 1719. The cupola of la Madona del Fuoco at Forli, in which he represented Paradise, is an admirable work. His principal pictures are at Rome, Bologna, and Forli.

CIGOLI, or CIVOLI, the painter. See CIVOLI.

CILIA, the EYE LASHES. See ANATOMY *Index*.

CILIATED LEAF, among botanical writers, one surrounded with parallel filaments somewhat like the hairs of the eye-lids.

CILICIA, an ancient kingdom of Asia, lying between the 36th and 40th degree of north latitude: bounded on the east by Syria, or rather by Mount Amanus, which separates it from that kingdom; by Pamphylia on the west; by Iauria, Cappadocia, and Armenia Minor, on the north; and by the Mediterranean sea on the south. It is so surrounded by steep and craggy mountains, chiefly Taurus and Amanus, that it may be defended by a handful of resolute men against a numerous army, there being but three narrow passes leading into it, commonly called *Pyla Cilicia*, or the gates of Cilicia; one on the side of Cappadocia,

Cid

Cilicia.

Cilicia.

padocia, called the *Pafs of Mount Taurus*; and the other two called the *Pafs of Mount Amanus*, and the *Pafs of Syria*. The whole country was divided by the ancients into Cilicia Aspera, and Cilicia Campestris; the former called by the Greeks *Trachæa* or *Stony*, from its abounding so with stones; and to this day the whole province is called by the Turks, *Tas Wileieth*, or the *Stony Province*.

According to Josephus, Cilicia was first peopled by Tarshish the son of Javan, and his descendants, whence the whole country was named *Tarsus*. The ancient inhabitants were in process of time driven out by a colony of Phœnicians, who under the conduct of *Cilix*, first settled in the island of Cyprus, and from thence passed into the country which, from the leader, they called *Cilicia*. Afterwards several other colonies from different nations settled in this kingdom, particularly from Syria and Greece; whence the Cilicians in some places used the Greek tongue, in others the Syriac; but the former greatly corrupted by the Persian, the predominant language of the country being a dialect of that tongue. We find no mention of the kings of Cilicia after their settlement in that country, till the time of Cyrus, to whom they voluntarily submitted, continuing subject to the Persians till the overthrow of that empire; but governed to the time of Artaxerxes Mnemon, by kings of their own nation. After the downfall of the Persian empire, Cilicia became a province of that of Macedon; and, on the death of Alexander, fell to the share of Seleucus, and continued under his descendants till it was reduced to a Roman province by Pompey. As a proconsular province, it was first governed by Appius Claudius Pulcher, and after him by Cicero, who reduced several strong holds on Mount Amanus, in which some Cilicians had fortified themselves, and held out against his predecessor. It was on this occasion that the division, formerly mentioned, into *Trachæa* and *Campestris*, took place. The latter became a Roman province; but the former was governed by kings appointed by the Romans, till the reign of Vespasian, when the family of Tracondementus being extinct, this part also made a province of the empire, and the whole divided into *Cilicia Prima*, *Cilicia Secunda*, and *Isauria*; the first took in all *Cilicia Campestris*, the second the coast of *Cilicia Trachæa*, and the last the inland parts of the same division. It is now a province of Asiatic Turkey; and is called *Caramania*, having been the last province of the Caramanian kingdom which held out against the Ottoman race.

That part of Cilicia called by the ancients *Cilicia Campestris*, was, if we believe Ammianus Marcellinus, one of the most fruitful countries of Asia; but the western part equally barren, though famous, even to this day, for an excellent breed of horses, of which 600 are yearly sent to Constantinople for the special use of the Grand Signior. The air in the inland parts is reckoned wholesome; but that on the sea-coast very dangerous, especially to strangers.

The rivers of any note are the *Pyramus*, which rises on the north side of Mount Taurus, and empties itself into the Mediterranean between *Iffus* and *Magarassus*; and the *Cydnus*, which springs from the *Antitaurus*, passes through *Tarsus*, and disembogues itself into the Mediterranean. This last is famous for the rapidity of

its stream, and the coldness of its waters which proved very dangerous to Alexander the Great.

The Cilicians, if we believe the Greek and Roman historians, were a rough unpolished race of people, unfair in their dealings, cruel, and liars even to a proverb. In the Roman times they became greatly addicted to piracy. They first began, in the time of the Mithridatic war, to infest the neighbouring provinces along with the Pamphylians; and, being emboldened with success, they soon ventured as far as the coasts of Greece and Italy, where they took a vast number of slaves, whom they sold to the Cypriots and the kings of Egypt and Syria. They were, however, at last defeated and entirely suppressed by Pompey the Great. See (*History of*) ROME.

CILICIA Terra, in the natural history of the ancients, a bituminous substance improperly called an earth, which, by boiling, became tough like bird-lime, and was used instead of that substance to cover the stocks of the vines for preserving them from the worms. It probably served in this office in a sort of double capacity, driving away these animals by its nauseous smell, and entangling them if they chanced to get amongst it.

CILICIUM, in Hebrew antiquity, a sort of habit made of coarse stuff, formerly in use among the Jews in times of mourning and distress. It is the same with what the Septuagint and Hebrew versions called sackcloth.

CILLEY, an ancient and famous town of Germany, in the circle of Austria, and in Stiria. It is the capital of a county of the same name, and is situated on the river Saan, in E. Long. 15. 15. N. Lat. 46. 31.

CILURNUM, (Notitia); a town of Britain: thought to be Collerton, or Collierford, in Northumberland; but Walwic, or Scilicester, according to Camden.

CIMA, or *SIMA*, in *Architecture*, the same with *Cymatium*, or *OGEE*.

CIMABUE, GIOVANI, a renowned painter, born at Florence in 1240, and the first who revived the art of painting in Italy. He painted, according to the custom of those times, in fresco and in distemper; colours in oil not being then found out. He excelled in architecture as well as in painting; and was concerned in the fabric of *Sancta Maria del Fior* at Florence, during which employment he died at the age of 60, and left many disciples.

CIMBRI, an ancient Celtic nation, inhabiting the northern parts of Germany. They are said to have been descended from the Asiatic *Cimmerians*, and to have taken the name of *Cimbri* when they changed their old habitations. When they first became remarkable, they inhabited chiefly the peninsula now called *Jutland*, and by the ancients *Cimbrica Chersonesus*. About 113 years before Christ, they left their peninsula with their wives and children; and joining the Teutones, a neighbouring nation, took their journey southward in quest of a better country. They first fell upon the Boii, a Gaulish nation situated near the Hercynian forest. Here they were repulsed, and obliged to move nearer the Roman provinces. The republic being then alarmed at the approach of such multitudes of barbarians, sent an army against them
ander

Cilicia

Cimbri.

Cimbri.

under the consul Papius Carbo. On the approach of the Roman army, the Cimbri made proposals of peace. The consul pretended to accept of it; but having thrown them into a disadvantageous situation, treacherously attacked their camp. His perfidy was rewarded as it deserved; the Cimbri ran to arms, and not only repulsed the Romans, but, attacking them in their turn, utterly defeated them, and obliged the shattered remains of their forces to conceal themselves in the neighbouring forests. After this victory the Cimbri entered Transalpine Gaul, which they quickly filled with slaughter and desolation. Here they continued five or six years, when another Roman army under the consul Silanus marched against them. This general met with no better success than Carbo had done. His army was routed at the first onset; in consequence of which, all Narbonne Gaul was exposed at once to the ravages of these barbarians.

About 105 years before Christ, the Cimbri began to threaten the Roman empire itself with destruction. The Gauls marched from all parts with a design to join them, and to invade Italy. The Roman army was commanded by the proconsul Cæpio, and the consul Mallius; but as these two commanders could not agree, they were advised to separate, and divide their forces. This advice proved the ruin of the whole army. The Cimbri immediately fell upon a strong detachment of the consular army commanded by M. Aurelius Scaurus, which they cut off to a man, and made Scaurus himself prisoner. Mallius being greatly intimidated by this defeat, desired a reconciliation with Cæpio, but was haughtily refused. He moved nearer the consul, however, with his army, that the enemy might not be defeated without his having a share in the action. The Cimbri, by this movement, imagining the commanders had made up their quarrel, sent ambassadors to Mallius with proposals of peace. As they could not help going through Cæpio's camp, he ordered them to be brought before him; but finding they were empowered to treat only with Mallius, he could scarce be restrained from putting them to death. His troops, however, forced him to confer with Mallius about the proposals sent by the barbarians: but as Cæpio went to the consul's tent against his will, so he opposed him in every thing; contradicted with great obstinacy, and insulted him in the grossest manner. The deputies on their return acquainted their countrymen that the misunderstanding between the Roman commanders still subsisted; upon which the Cimbri attacked the camp of Cæpio, and the Gauls that of Mallius. Both were forced, and the Romans slaughtered without mercy. Eighty thousand citizens and allies of Rome, with 40,000 servants and sutlers, perished on that fatal day. In short, of the two Roman armies only 10 men, with the two generals, escaped to carry the news of so dreadful a defeat. The conquerors destroyed all the spoil, pursuant to a vow they had made before the battle. The gold and silver they threw into the Rhone, drowned the horses they had taken, and put to death all the prisoners.

The Romans were thrown into the utmost consternation on the news of so terrible an overthrow. They saw themselves threatened with a deluge of Cimbri and Gauls, numerous enough to overrun the whole country. They did not, however, despair. A new

army was raised with incredible expedition; no citizen whatever who was fit to bear arms being exempted. On this occasion also, fencing-masters were first introduced into the Roman camp; by which means the soldiers were soon rendered in a manner invincible. Marius, who was at that time in high reputation on account of his victories in Africa, was chosen commander, and waited for the Cimbri in Transalpine Gaul: but they had resolved to enter Italy by two different ways; the Cimbri over the eastern, and the Teutones and other allies over the western Alps. The Roman general therefore marched to oppose the latter, and defeated the Ambrones and Teutones with great slaughter*. The Cimbri, in the mean time, entered Italy, and struck the whole country with terror. Catullus and Sylla attempted to oppose them; but their soldiers were so intimidated by the fierce countenances and terrible appearance of these barbarians, that nothing could prevent their flying before them. The city of Rome was now totally defenceless; and, had the Cimbri only marched briskly forwards, they had undoubtedly become masters of it; but they waited in expectation of being joined by their allies the Ambrones and Teutones, not having heard of their defeat by Marius, till the senate had time to recal him to the defence of his country. By their order he joined his army to that of Catullus and Sylla; and upon that union was declared commander in chief. The Roman army consisted of 52,300 men. The cavalry of the Cimbri were no more than 15,000, but their foot seemed innumerable; for, being drawn up in a square, they are said to have covered 30 furlongs. The Cimbri attacked the Romans with the utmost fury; but, being unaccustomed to bear the heats of Italy, they soon began to lose their strength, and were easily overcome. But they had put it out of their power to fly; for, that they might keep their ranks the better, they had, like true barbarians, tied themselves together with cords fastened to their belts, so that the Romans made a most terrible havoc of them. The battle was therefore soon over, and the whole day employed only in the most terrible butchery. An hundred and twenty thousand were killed on the field of battle, and 60,000 taken prisoners. The victorious Romans then marched to the enemy's camp, where they had a new battle to fight with the women, whom they found more fierce than even their husbands had been. From their carts and waggons, which formed a kind of fortification, they discharged showers of darts and arrows on friends and foes without distinction. They first suffocated their children in their arms and then put an end to their own lives. The greatest part of them hanged themselves on trees. One was found hanging at a cart with two of her children at her heels. Many of the men, for want of trees and stakes, tied strings in running knots about their necks, and fastened them to the tails of their horses, and the horns and feet of their oxen, in order to strangle themselves that way; and thus the whole multitude was destroyed.

The country of the Cimbri, which, after this terrible catastrophe, was left a mere desert, was again peopled by the Scythians; who, being driven by Pompey out of that vast space between the Euxine and the Caspian sea, marched towards the north and west of Europe,

Cimbri.

* See Ambrones and Teutones.

Cimex
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Cimolia.

Europe, subduing all the nations they met with in their way. They conquered Russia, Saxony, Westphalia, and other countries as far as Finland, Norway, and Sweden. It is pretended that Wodin their leader traversed so many countries, and endeavoured to subdue them, only with a view to excite the people against the Romans; and that the spirit of animosity which he had excited operated so powerfully after his death, that the northern nations combined to attack it, and never ceased their incursions till it was totally subverted.

CIMEX, or BUG, in *Zoology*, a genus of insects belonging to the order of hemiptera. See ENTOMOLOGY *Index*.

The methods of expelling house-bugs are various, as oil of turpentine, the smoke of corn-mint, of narrow-leaved wild cress, of herb-robert, of the reddish agaric, of mustard, Guinea pepper, peats or turf, &c. See also BUG and CIMICIFUGA.

CIMICIFUGA. See BOTANY *Index*.

The cimicifuga foetida has obtained the name of *cimicifuga*, or *bugbane*, both in Siberia and Tartary, from its property of driving away those insects; and the botanists of those parts of Europe which are infested by them, have long desired to naturalise it in their several countries. Gmelin mentions, that in Siberia the natives also use it as an evacuant in dropsy; and that its effects are violently emetic and drastic.

CIMMERII, anciently a people near the Palus Mæotis. They invaded Asia Minor 1284 years before Christ, and seized upon the kingdom of Cyaxares. After they had been masters of the country for 28 years, they were driven back by Alyates king of Lydia. The name also of another nation on the western coast of Italy. The country which they inhabited was supposed to be so gloomy, that to express a great obscurity the expression of *Cimmerian darkness* has proverbially been used; and Homer, according to Plutarch, drew his images of hell and Pluto from the gloomy and dismal country where they dwelt.

CIMMERIUM, in *Ancient Geography*, a town at the mouth of the Palus Mæotis; from which the Bosphorus Cimmerius is named; that strait which joins the Euxine and the Palus Mæotis. *Cimmerii* was the name of the people, (Homer): and here stood the Promontorium Cimmerium, (Ptolemy); and hence probably the modern appellation *Crim*.

CIMMERIUM, in *Ancient Geography*, a place near Baiæ, in Campania, where formerly stood the cave of the sibyl. The people were called *Cimmerii*, who living in subterraneous habitations, from which they issued in the night to commit robberies and other acts of violence, never saw the light of the sun (Homer). To give a natural account of this fable, Festus says, there was a valley surrounded with a pretty high ridge, which precluded the morning and evening sun.

CIMOLIA TERRA, in *Natural History*, a name by which the ancients expressed a very valuable medicinal earth; but which later ages have supposed to be no other than our tobacco-pipe clay and fuller's earth.

The cimolia terra of the ancients was found in several of the islands of the Archipelago, particularly in the island of Cimolus, from whence it has its name. It was used with great success in the erysipelas, in-

flammations, and the like, being applied by way of cataplasm to the part. They also used, as we do, what we call *cimolia*, or fuller's earth, for the cleansing of clothes. This earth of the ancients, though so long disregarded, and by many supposed to be lost, is yet very plentiful in Argentiere (the ancient Cimolus), Sphanto, and many of those islands. It is a matl of a lax and crumbly texture, and a pure bright white colour, very soft to the touch. It adheres firmly to the tongue, and, if thrown into water, raises a little hissing and ebullition, and moulders to a fine powder. It makes a considerable effervescence with acids, and suffers no change of colour in the fire. These are the characters of what the ancients called simply *terra cimolia*; but besides this, they had from the same place another earth which they called by the same general name, but distinguished by the epithet purple, *purpurefscens*. This they described to be fattish, cold to the touch, of a mixed purple colour, and nearly as hard as a stone. And this was evidently the substance we call *sealites*, or the *soap-rock*, common in Cornwall, and also in the island of Argentiere, or Cimolus.

CIMOLIA Alba, the officinal name of the earth of which we now make tobacco-pipes. Its distinguishing characters are, that it is a dense, compact, heavy earth, of a dull white colour, and very close texture; it will not easily break between the fingers, and slightly stains the skin in handling. It adheres firmly to the tongue; melts very slowly in the mouth, and is not readily diffusible in water. It is found in many places. That of the isle of Wight is much esteemed for its colour. Great plenty of it is found near Pole in Dorsetshire, and near Wedensbury in Staffordshire.

CIMOLIA Nigra, is of a dark lead colour, hard, dry, and heavy; of a smooth compact texture, and not viscid: it does not colour the hands; crumbles when dry; adheres to the tongue; diffuses slowly in water; and is not acted upon by acids. It burns perfectly white, and acquires a considerable hardness. The chief pits for this clay are near Northampton, where it is used in the manufacture of tobacco-pipes. It is also mixed with the critche clay of Derbyshire, in the proportion of one part to three, in the manufacture of the hard reddish brown ware.

CIMOLUS, in *Ancient Geography*, one of the Cyclades, now called *Argentiere*.

CIMON, an Athenian, son of Miltiades and Hegesippyle. He was famous for his debaucheries in his youth, and the reformation of his morals when arrived to years of discretion. He behaved with great courage at the battle of Salamis, and rendered himself popular by his munificence and valour. He defeated the Persian fleet, took 200 ships, and totally routed their land army, the very same day, A. U. C. 284. The money that he obtained by his victories was not applied for his own private use, but with it he fortified and embellished the city. He some time after lost all his popularity, and was banished by the Athenians, who declared war against the Lacedæmonians. He was recalled from his exile, and at his return he made a reconciliation between Lacedæmon and his countrymen. He was afterwards appointed to carry on the war against Persia in Egypt and Cyprus, with a fleet of 200 ships, and on the coast of Asia he gave battle to the enemy, and totally ruined their fleet, A. U. C. 304.

Cimolia
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Cimon.

Cinaloa
||
Cinchona.

He died as he was besieging the town of Citium in Cyprus. He may be called the last of the Greeks whose spirit and boldness defeated the armies of the barbarians. He was such an inveterate enemy to the Persian power, that he formed a plan of totally destroying it; and in his wars he had so reduced the Persians, that they promised in a treaty not to pass the Chelidonian islands with their fleet, or to approach within a day's journey of the Grecian seas. See ARTICA.

CINALOA, a province of Mexico in South America, abounding in corn, cattle, and cotton; and rendered extremely picturesque by a number of beautiful cascades of clear water that fall down from the mountains. It lies on the eastern coast of the sea of California, and has a town of the same name, situated in N. Lat. 26°.

CINARA, in *Botany*, the ARTICHOKE. See CYNARA, BOTANY *Index*.

CINCHONA. See BOTANY *Index*.

According to some, the Peruvians learned the use of the bark of this tree by observing certain animals affected with intermittents instinctively led to it; while others say, that a Peruvian having an ague, was cured by happening to drink of a pool which, from some trees having fallen into it, tasted of cinchona; and its use in gangrene is said to have originated from its curing one in an aguish patient. About the year 1640, the lady of the Spanish viceroy, the Comitissa del Cinchon, was cured by the bark, which has therefore been called *Cortex* or *Pulvis Comitissæ Cinchona*, *Chinachina*, or *Chinchina*, *Kinakina* or *Kinkina*, *Quinaquina* or *Quinquina*; and from the interest which the cardinal de Lugo and the Jesuit fathers took in its distribution, it has been called *Cortex* or *Pulvis Cardinalis de Lugo*, *Jesuiticus*, *Patrum*, &c.

On its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became very universally established. For a number of years, the bark which is rolled up into short thick quills, with a rough coat, and a bright cinnamon colour, in the inside, which broke brittle, and was found, had an aromatic flavour, a bitterish astringent taste, with a degree of aromatic warmth, was esteemed the best; though some esteemed the large pieces as of equal goodness. During the time of the late war, in the year 1779, the *Huffar* frigate took a Spanish ship, loaded principally with Peruvian bark, which was much larger, thicker, and of a deeper reddish colour than the bark in common use. Soon after it was brought to London, it was tried in St Bartholomew's hospital, and in other hospitals about town, and was said to be more efficacious than the quill bark. This put practitioners on examining into the history of the bark, on trying experiments with it, and on making comparative trials of its effects with those of the bark in common use on patients labouring under intermittent complaints. In July 1782, Dr William Saunders published an account of this red bark, in which he says, that the small quill bark used in England is either the bark of young trees, or of the twigs or branches of the old ones; and that the large bark, called the *red bark* from the deep colour, is the bark of the trunk of the old trees;

and he mentions a Mr Arnot, who himself gathered the bark from the trees in Peru; and Mons. Condamine, who gives an account of the tree in the Memoirs of the Academy of Sciences at Paris in the year 1738; who both say, that taking the bark from an old tree effectually kills it; but that most of the young trees which are barked, recover, and continue healthy; and that for these reasons the Spaniards now barked the younger trees for foreign markets, though they still imported into Spain some of the bark of the old trees, which they esteemed to be much more efficacious than what was got from the young. From these accounts Dr Saunders concludes, that the large red bark brought to London in the year 1779 was of the same kind as that used by Sydenham and Morton, as it answers to the description of the bark used in their time, which is given by Dale and other writers on the materia medica, who were their contemporaries. Dr Saunders says, that it is not only stronger and more resinous, but likewise more efficacious and certain in its effect, than the common bark, and had cured many agues after the other had failed.

A species of cinchona has also been discovered in the West India islands, particularly in Jamaica. It is accurately described by Dr Wright, under the title of *Cinchona Jamaicaensis*, in a paper published in the Philosophical Transactions. In Jamaica it is called the *sea-side beech*, and grows from 20 to 40 feet high. The white, furrowed, thick outer bark is not used; the dark-brown inner bark has the common flavour, with a mixed kind of a taste, at first of horse-radish and ginger, becoming at last bitter and astringent. It seems to give out more extractive matter than the cinchona officinalis. Some of it was imported from St Lucia, in consequence of its having been used with advantage in the army and navy during the last war; and it has lately been treated of at considerable length by Dr Kentish, under the title of *St Lucia bark*. The fresh bark is found to be considerably emetic and cathartic, which properties it is said to lose on drying.

The pale and the red are chiefly in use in Britain. The pale is brought to us in pieces of different sizes, either flat or quilled, and the powder is rather of a lighter colour than that of cinnamon. The red is generally in much larger, thicker, flattish pieces, but sometimes also in the form of quills, and its powder is reddish like that of Armenian bole. As already observed, it is much more resinous, and possesses the sensible qualities of the cinchona in a much higher degree, than the other sorts; and the more nearly the other kinds resemble the red bark, the better they are now considered. The red bark is heavy, firm, sound, and dry; friable between the teeth; does not separate into fibres; and breaks, not shivery, but short, close, and smooth. It has three layers; the outer is thin, rugged, of a reddish brown colour, but frequently covered with mossy matter; the middle is thicker, more compact, darker coloured, very resinous, brittle, and yields first to the pestle; the inmost is more woody, fibrous, and of a brighter red.

The Peruvian bark yields its virtues both to cold and boiling water; but the decoction is thicker, gives out its taste more readily, and forms an ink with a chalybeate more suddenly than the fresh cold infusion. This infusion, however, contains at least as much extractive

Cinchona.

Cinchona. tractive matter, but more in a state of solution; and its colour, on standing sometime with the chalybeate, becomes darker, while that of the decoction becomes more faint. When they are of a certain age, the addition of a chalybeate renders them green; and when this is the case, they are found to be in a state of fermentation, and effete. Mild or caustic alkalis, or lime, precipitate the extractive matter, which in the case of the caustic alkali is redissolved by a farther addition of the alkali. Lime-water precipitates less from a fresh infusion than from a fresh decoction; and in the precipitate of this last some mild earth is perceptible. The infusion is by age reduced to the same state with the fresh decoction, and then they deposit nearly an equal quantity of mild earth and extractive matter; so that lime-water, as well as a chalybeate, may be used as a test of the relative strength, and perishable nature of the different preparations, and of different barks. Accordingly cold infusions are found by experiments to be less perishable than decoctions; infusions and decoctions of the red bark than those of the pale; those of the red bark, however, are found by length of time to separate more mild earth with the lime-water, and more extractive matter. Lime-water, as precipitating the extractive matter, appears an equally improper and disagreeable menstruum.

Water is found to suspend the resin by means of much less gum than has been supposed. Alcohol extracts a bitterness, but no astringency, from a residuum of 20 affusions of cold water; and water extracts astringency, but no bitterness from the residuum of as many affusions of alcohol. The residuum in both is insipid.

From many ingenious experiments made on the Peruvian bark by Dr Irvine, which are now published in a dissertation which gained the prize-medal given by the Harveian Society of Edinburgh for 1783, the power of different menstrua, as acting upon Peruvian bark is ascertained with greater accuracy than had before been done; and it appears, that with respect to comparative power, the fluids after mentioned act in the order in which they are placed.

Dulcified spirit of vitriol.
Caustic ley.
French brandy.
Rhenish wine.
Soft water.
Vinegar and water.
Dulcified spirit of nitre.
Mild volatile alkali.
Alcohol.
Mild vegetable alkali.
Lime-water.

The antiseptic powers of vinegar and bark united are double the sum of those taken separately. The astringent power of the bark is increased by sulphuric acid; the bitter taste is destroyed by it.

The official preparations of the bark are, 1. The powder: of this, the first parcel that passes the sieve being the most resinous and brittle layer, is the strongest. 2. The extract: the watery and spirituous extract conjoined form the most proper preparations of this kind. 3. The resin: this cannot perhaps be obtained separate from the gummy part, nor would it be

desirable. 4. Spirituous tincture: this is best made with proof-spirit. 5. The decoction: this preparation, though frequently employed, is yet in many respects inferior even to a simple watery infusion.

The best form is that of powder, in which the constituent parts are in the most effectual proportion. The cold infusion, which can be made in a few minutes by agitation, the spirituous tincture, and the extract, are likewise proper in this respect. For covering the taste, different patients require different vehicles; liquorice, aromatics, acids, port-wine, small beer, porter, milk, butter-milk, &c. are frequently employed; and those who dislike the taste of the bark itself, vary in their accounts to which the preference is due; or it may be given in form of electuary with currant-jelly, or with brandy or rum.

Practitioners have differed much with regard to the mode of operation of the Peruvian bark. Some have ascribed its virtues entirely to a stimulant power. But while the strongest and most permanent stimuli have by no means the same effect with bark in the cure of diseases, the bark itself shows hardly any stimulant power, either from its action on the stomach, or on other sensible parts to which it is applied. From its action on dead animal fibres, there can be no doubt of its being a powerful astringent; and from its good effects in certain cases of disease, there is reason to presume that it is a still more powerful tonic. To this tonic power some think that its action as an antiseptic is to be entirely attributed; but that, independently of this, it has a very powerful effect in resisting the septic process to which animal substances are naturally subjected, appears beyond all dispute, from its effects in resisting putrefaction, not only in dead animal solids, but even in animal fluids, when entirely detached from the living body.

But although it be admitted that the Peruvian bark acts powerfully as an astringent, as a tonic, and as an antiseptic; yet these principles will by no means explain all the effects derived from it in the cure of diseases. And accordingly, from no artificial combination in which these powers are combined, or in which they exist even to a higher degree, can the good consequences resulting from Peruvian bark be obtained. Many practitioners, therefore, are disposed to view it as a specific. If by a specific we mean an infallible remedy, it cannot indeed be considered as intitled to that appellation; but in as far as it is a very powerful remedy, of the operation of which no satisfactory explanation has yet been given, it may with great propriety be denominated a specific. But whatever its mode of operation may be, there can be no doubt that it is daily employed with success in a great variety of different diseases.

It was first introduced, as has already been said, for the cure of intermittent fevers; and in these, when properly exhibited, it rarely fails of success. Practitioners, however, have differed with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it in the quantity of an ounce, between the fits; the dose being the more frequent and larger according to the frequency of the fits; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than

Cinchona. is necessary, we consider as upon the whole preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents it seems even hardly necessary.

It often pukes or purges, and sometimes oppresses the stomach. These, or any other effects that may take place, are to be counteracted by remedies particularly appropriated to them. Thus, vomiting is often restrained by exhibiting it in wine; looseness by combining it with opium; and oppression at stomach, by the addition of an aromatic. But unless for obviating particular occurrences, it is more successful when exhibited in its simple state than with any addition; and there seems to be little ground for believing that its powers are increased by crude sal ammoniac, or any other additions which have frequently been made.

It is now given, from the very commencement of the disease, without previous evacuations, which, with the delay of the bark, or under doses of it, by retarding the cure, often seem to induce abdominal inflammation, scirrhus, jaundice, hectic, dropsy, &c. symptoms formerly imputed to the premature or immoderate use of the bark, but which are best obviated by its early and large use. It is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion, return. Its use is then to be gradually left off, and repeated at proper intervals to secure against a relapse; to which, however unaccountable, independently of the recovery of vigour, there often seems to be a peculiar disposition; and especially when the wind blows from the east. Although, however, most evacuations conjoined with the Peruvian bark in intermittents are rather prejudicial than otherwise, yet it is of advantage, previous to its use, to empty the alimentary canal, particularly the stomach; and on this account good effects are often obtained from premising an emetic.

It is a medicine which seems not only suited to both formed and latent intermittents, but to that state of fibre on which all rigidly periodical diseases seem to depend; as periodical pain, inflammation, hemorrhagy, spasm, cough, loss of external sense, &c.

Bark is now used by some in all continued fevers: at the same time attention is paid to keep the bowels clean, and to promote when necessary the evacuation of redundant bile; always, however, so as to weaken as little as possible.

In confluent smallpox, it promotes languid eruption and suppuration, diminishes the fever through the whole course of it, and prevents or corrects putrescence and gangrene.

In gangrenous sore throats it is much used, as it is externally and internally in every species of gangrene.

In contagious dysentery, after due evacuation, it has been used by the mouth, and by injection with and without opium.

In all those hemorrhagies called *passive*, and which it is allowed all hemorrhagies are very apt to become, and likewise in other increased discharges, it is much used; and in certain undefined cases of hæmoptysis, some allege that it is remarkably effectual when joined with an absorbent.

It is used for obviating the disposition to nervous and

convulsive diseases; and some have great confidence in it joined with sulphuric acid, in cases of phthisis, scrophula, ill-conditioned ulcers, rickets, scurvy, and in states of convalescence.

In these cases in general, notwithstanding the use of the acid, it is proper to conjoin it with a milk diet.

In dropsy, not depending on any particular local affection, it is often alternated or conjoined with diuretics, or other evacuants; and by its early exhibition after the water is once drawn off, or even begins to be freely discharged, a fresh accumulation is prevented, and a radical cure obtained. In obstinate venereal cases, particularly those which appear under the form of pains in the bones, the Peruvian bark is often successfully subjoined to mercury, or even given in conjunction with it.

CINCINNATUS, the Roman dictator, was taken from the plough, to be advanced to the dignity of consul, in which office he restored public tranquillity, and then returned to his rural employments. Being called forth a second time to be dictator, he conquered the enemies of Rome, and, refusing all rewards, retired again to his farm, after he had been dictator only 16 days. The same circumstance appeared once more in the 80th year of his age. He died 376 years before Christ.

Order of CINCINNATUS, or the Cincinnati, a society which was established in America soon after the peace, and consists of the generals and officers of the army and navy of the United States. This institution, called after the name of the Roman dictator mentioned in the preceding article, was intended to perpetuate the memory of the revolution, the friendship of the officers, and the union of the states; and also to raise a fund for the relief of poor widows and orphans whose husbands and fathers had fallen during the war, and for their descendants. The society was subdivided into state societies, which were to meet on the 4th of July, and with other business depute a number of their members to convene annually in general meetings. The members of the institution were to be distinguished by wearing a medal, emblematical of the design of the society; and the honours and advantages were to be hereditary in the eldest male heirs, and, in default of male issue, in the collateral male heirs. Honorary members were to be admitted, but without the hereditary advantages of the society, and provided their number should never exceed the ratio of one to four of the officers or their descendants. Though the apparent designs of this society were harmless and honourable, it did not escape popular jealousy. Views of a deeper nature were imputed to the framers, and the institution was censured and opposed as giving birth to a military nobility, of a dangerous aristocratic power, which might ultimately prove ruinous to the liberties of the new empire. But the principal ground of apprehension was the supposed right of inheritance connected with this honour to render it hereditary; which, however, hath been given up and totally disclaimed by the society.

CINCTURE, in *Architecture*, a ring, list, or orlo, at the top and bottom of the shaft of a column, separating the shaft at one end from the base, and at the other from the capital.

CINEAS, a Thessalian, minister and friend to Pyrrhus

Cineritious
||
Cinnabar

thus king of Epirus. He was sent to Rome by his master to sue for a peace, which he, however, could not obtain. He told Pyrrhus that the Roman senate was a venerable assembly of kings; and observed, that to fight with them was to fight against another Hydra. He was of such a retentive memory, that the day after his arrival at Rome he could call every senator and knight by his name.

CINERITIOUS, an appellation given to different substances, on account of their resembling ashes either in colour or consistence; hence it is that the cortical part of the brain has sometimes got this epithet.

CINNA, L. CORN. a Roman who oppressed the republic with his cruelties. He was banished by Octavius for attempting to make the fugitive slaves free. He joined himself with Marius, and with him at the head of the slaves he defeated his enemies, and made himself consul even to a fourth time. He massacred so many citizens at Rome, that his name became odious, and one of his officers assassinated him at Ancona, as he was preparing war against Sylla.

CINNA, C. *Helvius*, a poet intimate with Cæsar. He went to attend the obsequies of Cæsar, and being mistaken by the populace for the other Cinna, he was torn to pieces.—Also a grandson of Pompey's. He conspired against Augustus, who pardoned him, and made him one of his most intimate friends. He was consul A. U. C. 758, and made Augustus his heir.

CINNABAR, in *Natural History*, is either native or factitious.

The *native* cinnabar is an ore of quicksilver, moderately compact, very heavy, and of an elegant striated red colour.

Factitious cinnabar is a mixture of mercury and sulphur sublimed, and thus reduced into a fine red glebe. The best is of a high colour, and full of fibres like needles. See *CHEMISTRY Index*.

The chief use of cinnabar is for painting. Although the body is composed of sulphur, which is of a light colour, and mercury which is white as silver, it is nevertheless of an exceeding strong red colour. Lumps of it are of a deep brown red without brilliancy; but when the too great intensity of its colour is diminished by bruising and dividing it into small parts, (which is a method generally used to lessen the intensity of all colours), the red of the cinnabar becomes more and more exalted, flame-coloured, and exceedingly vivid and brilliant: in this state it is called *vermilion*.

Cinnabar is often employed as an internal medicine. Hoffman greatly recommends it as a sedative and antispasmodic, and Stahl makes it an ingredient in his *temperant powder*. Other intelligent physicians deny that cinnabar taken internally has any medicinal quality. Their opinion is grounded on the insolubility of this substance in any menstruum. This question concerning its internal utility cannot be decided without further researches and experiments; but cinnabar is certainly used with success to procure a mercurial fumigation, when that method of cure is proper in venereal diseases. For this purpose it is burnt in an open fire on red-hot coals, by which the mercury is disengaged and forms vapours, which, being applied to the body of the diseased person, penetrate through the

pores of the skin, and produce effects similar to those of mercury administered by friction.

CINNAMON, the bark of two species of *laurus*. The true cinnamon is from the *laurus cinnamomum*; and the base cinnamon, which is often sold for the true, is from the *laurus cassia*. See LAURUS, *BOTANY Index*.

CINNAMON Water, is made by distilling the bark first intuted in alcohol, brandy, or white-wine.

Clove-CINNAMON, is the bark of a tree growing in Brazil, which is often substituted for real cloves.

White CINNAMON; called also *Winter's bark*, is the bark of a tree frequent in the isles of St Domingo, Guadaloupe, &c. of a sharp biting taste like pepper. Some use it instead of nutmeg; and in medicine it is esteemed a stomachic and antiscorbutic. See CANELLA.

CINNAMUS, a Greek historian, wrote a history of the eastern empire, during the reigns of John and Manuel Commenes, from 1118 to 1143. His style is reckoned the best of the modern Greek authors. He died after 1183.

CINNERETH, CINERETH, *Chinnereth*, (Moses); or *Gennesareth*, in *Ancient Geography*, a lake of the Lower Galilee, called the *Sea of Galilee*, (Matthew); of *Tiberius*, (John). Its name *Gennesareth* is from a small cognominal district upon it. In breadth 40 stadia, in length 140. The water fresh and fit to drink, and abounding in fish.

CINQUEFOIL, in *Botany*. See POTENTILLA.

CINQUE-PORTS, five havens that lie on the east part of England, towards France; thus called by way of eminence on account of their superior importance, as having been thought by our kings to merit a particular regard for their preservation against invasion. Hence they have a particular policy, and are governed by a keeper with the title of *Lord-warden of the Cinque-ports*.

Cambden tells us, that William the Conqueror first appointed a warden of the Cinque-ports; but King John first granted them their privileges, and that upon condition they should provide 80 ships at their own charge for 40 days, as often as the king should have occasion in the wars, he being then straitened for a navy to recover Normandy.

The five ports are Hastings, Romney, Hythe, Dover, and Sandwich.—Thorn tells us, that Hastings provided 21 vessels, and in each vessel 21 men. To this port belong Seaford, Pevensey, Hedney, Winchelsea, Rye, Hamine, Wakebourn, Creneth, and Fotherclife.—Romney provided five ships, and in each 24 men. To this belonged Bromhal, Lyde, Oswardstone, Dangemares, and Romenhal.—Hythe furnished five ships, and in each 21 seamen. To this belongs Westmeath.—Dover the same number as Hastings. To this belongs Folkston, Feverham, and Marge.—Lastly, Sandwich furnished the same with Hythe. To this belong Fordiwic, Reculver, Serre, and Deal.

The privileges granted to them in consequence of these services were very great. Amongst others, they were each of them to send two barons to represent them in parliament; their deputies were to bear the canopy over the king's head at the time of his coronation, and to dine at the uppermost table in the great

Cinnamoa
||
Cinque-
Ports.

Cintra
||
Cipher.

great hall on his right hand; to be exempted from subsidies and other aids; their heirs to be free from personal wardship, notwithstanding any tenure; to be impleaded in their own towns, and not elsewhere; not to be liable to tolls, &c.

The Cinque-ports give the following titles: Hastings, a barony to the ancient family of Huntington; Romney, to the Marshams; Dover, new barony, to a branch of the York family; formerly a dukedom (now extinct) to the Queensberry family; Sandwich, an earldom to a branch of the Montagues.

CINTRA, a cap and mountain of Portugal, in the province of Estremadura, usually called the *Rock of Lisbon*. It lies on the north side of the entrance of the river Tajo; and there is a town of the same name situated thereon. W. Long. 10. 15. N. Lat. 59. 0.

CINUS, or CYNUS, a famous civilian of Pistoia in the 14th century. His commentary on the Code was finished in 1313; he also wrote on some parts of the digest. He was no less famous for his Italian poems, and is ranked among those who first gave graces to the Tuscan lyric poetry.

CINYRA, in the Jewish antiquities, a musical instrument. This, and the Hebrew *cinnor*, which is generally translated *cithera*, *lyra*, or *psalterium*, are the same. It was made of wood, and was played on in the temple of Jerusalem. Josephus says that the *cinyra* of the temple had ten strings, and that it was touched with a bow. In another place he says that Solomon made a great number of them with a precious kind of metal called *electrum*, wherein he contradicts the Scriptures, which inform us that Solomon's *cinnors* were made of wood.

CINYRAS, in fabulous history, a king of Cyprus, son of Paphus. He married Cenchreis, by whom he had a daughter called *Myrrha*. Myrrha fell in love with her father, and in the absence of her mother she introduced herself into his bed by means of her nurse. Cinyras had by her a son called *Adonis*; and when he knew the incest he had committed, he attempted to stab his daughter, who escaped his pursuit and fled to Arabia, where, after she had brought forth, she was changed into a tree which still bears her name. Cinyras, according to some, stabbed himself.

CION, or CYON, in *Gardening*, a young shoot, sprout, or sprig, put forth by a tree. Grafting is performed by the application of the cion of one plant upon the stock of another. To produce a stock of cions for grafting, planting, &c. the gardeners sometimes cut off the bodies of trees a little above the ground, and only leave a stump or root standing: the redundant sap will not fail next spring to put forth a great number of shoots. In dressing dwarf-trees, a great many cions are to be cut off.

CIOTAT, a sea-port town of Provence in France; famous for Muscadine wine. It is seated on the bay of Laquea, between Marseilles and Toulon; and the harbour is defended by a strong fort. E. Long. 5. 30. N. Lat. 43. 10.

CIPHER, or CYPHER, one of the Arabic characters or figures used in computation, formed thus, 0. See ARITHMETIC.

CIPHER is also a kind of enigmatic character, composed of several letters interwoven, which are generally the initial letters of the persons names for whom

the ciphers are intended. These are frequently used on seals, coaches, and other moveables.—Anciently, merchants and tradesmen were not allowed to bear arms: in lieu thereof, they bore their ciphers, or the initial letters of their names, artfully interwoven about a cross, of which we have divers instances on tombs, &c. See DEVISE.

CIPHER, denotes likewise certain secret characters disguised and varied, used in writing letters that contain some secret, not to be understood but by those between whom the cipher is agreed on.

De la Guilletiere, in his *Lacedæmon ancient and modern*, endeavours to make the ancient Spartans the inventors of the art of writing in cipher. Their scytala, according to him, was the first sketch of this mysterious art: these scytalæ were two rollers of wood, of equal length and thickness; one of them kept by the ephori, the other by the general of the army sent on any expedition against the enemy. Whensoever those magistrates would send any secret orders to the general, they took a slip of parchment, and rolled it very justly about the scytala which they had reserved, and in this state wrote their intentions, which appeared perfect and consistent while the parchment continued on the roll: when taken off, the writing was maimed, and without connexion, but was easily retrieved by the general, upon his applying it to his scytala.

Polybius says, that Æneas Tacitus, 2000 years ago, collected together 20 different manners of writing so as not to be understood by any but those in the secret; part whereof were invented by himself, and part used before his time.—Trithemius, Cap. Porta, Vigenere, and P. Nicéron, have written expressly on the subject of *ciphers*.

As the writing in *cipher* is become an art, so is the reading or unravelling thereof, called *deciphering*.—The rules of deciphering are different in different languages. By observing the following, you will soon make out any common cipher written in English.

1. Observe the letters or characters that most frequently occur, and set them down for the six vowels, including *y*, and of these the most frequent will generally be *e*, and the least frequent *u*.
2. The vowels that most frequently come together are *ea*, and *ou*.
3. The consonant most common at the ends of words is *s*, and the next frequent *r* and *t*.
4. When two familiar characters come together, they are most likely to be the consonants *f*, *l*, or *s*, or the vowels *e* or *o*.
5. The letter that precedes or follows two similar characters is either a vowel, or *l*, *m*, *n*, or *r*.
6. In deciphering, begin with the words that consist of a single letter, which will be either *a*, *I*, *o*, or *o*.
7. Then take the words of two letters, one of which will be a vowel. Of these words the most frequent are, *an*, *to*, *be*, *by*, *of*, *on*, *or*, *no*, *so*, *as*, *at*, *if*, *in*, *is*, *it*, *he*, *me*, *my*, *us*, *we*, *am*.
8. In words of three letters there are most commonly two consonants. Of these words the most frequent are, *the*, *and*, *not*, *but*, *yet*, *for*, *tho'*, *how*, *why*, *all*, *you*, *she*, *his*, *her*, *our*, *who*, *may*, *can*, *did*, *was*, *are*, *has*, *had*, *let*, *one*, *two*, *six*, *ten*, &c.—Some of these, or those of two letters, will be found in every sentence.
9. The most common words of four letters are, *this*, *that*,

Cipher. *that, then, thus, with, when, from, here, some, most, none, they, them, whom, mine, your, self, must, will, have, been, were, four, five, nine, &c.*

10. The most usual words of five letters, are, *there, these, those, which, where, while, since, there, shall, might, could, would, ought, three, seven, eight, &c.*

11. Words of two or more syllables frequently begin with double consonants, or with a preposition; that is, a vowel joined with one or more consonants. The most common double consonants are *bl, br, dr, fl, fr, gl, gr, ph, pl, pr, sb, sb, sp, st, th, tr, wh, wr, &c.* and the most common prepositions are *com, con, de, dis, ex, im, in, int, mis, per, pre, pro, re, sub, sup, un, &c.*

12. The double consonants most frequent at the end of long words, are, *ck, ld, lf, mn, nd, ng, rl, rm, rn, rp, rt, sm, st, &c.* and the most common terminations are *ed, en, er, es, et, ing, ly, son, sion, tion, able, ence, ent, ment, full, less, ness, &c.*

On Plate CXLIV. in Vol. V. fig. 7. is given an example of a cipher wrote in arbitrary characters as is commonly practised. It will be easily deciphered by observing the rules: but when the characters are all placed close together, as in the example fig. 8. and as they always should be, the deciphering is much more difficult.

To decipher a writing of this sort, you must first look for those characters that most frequently occur, and set them down for vowels as before. Then observe the similar characters that come together; but you must remember that two such characters may here belong to two words. You are next to remember the combinations of two or three characters that are most frequent; which will be some of the words in the seventh and eighth of the foregoing rules; and by observing the other rules, you will infallibly discover, with time and attention, any cipher wrote on these principles.

When the words are wrote all close together, if the key to the cipher were to be changed every word, according to a regular method agreed on between the parties, as might be done by either of the methods mentioned in N^o II. below, with very little additional trouble, the writing would then be extremely difficult to decipher. The longer any letter written in cipher is, the more easy it is to decipher, as then the repetitions of the characters and combinations are the more frequent.

The following are the contents of the two foregoing ciphers, in which we have inverted the order of the words and letters, that they who are desirous of trying their talent at deciphering, may not, inadvertently, read the explanation before the cipher.

enil eno ton dna shtnom elohw eerht, suoidifrep dna leurc o noitnac & ecnedurp fo klat lliw uoy: on, rotiaart, tcelgen & ecneressidni si ti. yltrohs rettel a em dnes ot suaem emof dnif rehtie, traeh eht morf semoc ti taht ees em tel &, erom ecaf ym ees ot erad reven ro.

evlewt fo ruoh eht ta thgin siht, ledatic eht fo etag eht erofeb elbmessa lliw sdneirf ruo lla. ruoh eht ot lautcnup eb: deraperp llew emoc dna, ytrebil ruoy niager ot, ylevarb eid ro. thgin eht si siht, su sekam rehtie taht, etiuq su seodnu ro.

Contrivances for communicating intelligence by CIPHER.

I. By means of a pack of cards. The parties must pre-

viously agree in what manner the cards shall be first placed, and then how they shall be shuffled. Thus suppose the cards are to be first placed in the order as hereafter follows, and then shuffled by taking off 3 from the top, putting the next 2 over them, and the following 3 under them*, and so alternately. Therefore the party who sends the cipher first writes the contents of it on a separate paper, and then copies the first 32 letters on the cards, by writing one letter on every card; he then shuffles them, in the manner described, and writes the second 32 letters: he shuffles them a second time, and writes the third 32 letters, and so of the rest. An example will make this plain. Suppose the letter to be as follows.

Cipher. * By shuffling the cards in this manner, there will remain only 2 to put under at last.

I am in full march to relieve you; within three days I shall be with you. If the enemy in the mean time should make an assault, remember what you owe to your country, to your family, and yourself. Live with honour, or die with glory.

Order of the cards before the 1st shuffle.

Ace spade	i a d u y i
Ten diamonds	a l e u l
Eight hearts	m l m o i u
King spades	i s u m t
Nine clubs	n h l e o
Seven diamonds	f b m r i
Nine diamonds	u e a c t n
Ace clubs	l w k r y i
Knave hearts	l s e e a e
Seven spades	m i a r m w
Ten clubs	a i t h e r
Ten hearts	r r b o f
Queen spades	c h e e i
Eight diamonds	h a b y w
Eight clubs	t y o o o l
Seven hearts	o y a o h o
Queen clubs	r o n u y h
Nine spades	e u i y f y
King hearts	l e t e u o
Queen diamonds	i d s o e
Eight spades	e i n w s o
Knave clubs	v f a n t g
Seven clubs	e t s l y
Ace hearts	y r e b r
Nine hearts	o l n w o t
Ace diamonds	u h s t & d
Knave spades	w l m a l
Ten spades	i e y t r r
King diamonds	t i i b u r
Queen hearts	b h m m u
King clubs	i n a t h
Knave diamonds	n e u r o

The person that receives these cards first places them in the order agreed on, and transcribes the first letter on every card. He then shuffles them, according to order, and transcribes the second letter on each card. He shuffles them a second time, and transcribes the third letters, and so of the rest.

If the cards were to be shuffled the second time by threes and fours, the third time by twos and fours, &c. it would make the cipher still more difficult to discover:

Cipher. ver: though as all ciphers depend on the combination of letters, there are scarce any that may not be deciphered with time and pains; as we shall show further on. Those ciphers are the best that are by their nature most free from suspicion of being ciphers; as for example, if the letters were there written with sympathetic ink, the cards might then pass for a common pack.

II. *By a dial.* On a piece of square pasteboard ABCD, fig. 3. 4. draw the circle EFGH, and divide it into 26 equal parts, in each of which must be written one of the letters of the alphabet.

On the inside of this there must be another circle of pasteboard, ILMN, moveable round the centre O, and the extremity of this must be divided into the same number of equal parts as the other. On this also must be written the letters of the alphabet, which, however, need not be disposed in the same order. The person with whom you correspond must have a similar dial, and at the beginning of your letter you must put any two letters that answer to each other when you have fixed the dial.

Exam. Suppose you would write as follows: "If you will come over to us, you shall have a pension, and you may still make a sham opposition." You begin with the letters *Ma*, which show how the dial is fixed: then for *If you*, you write *un juc*, and so for the rest, as you will see at fig. 6.

The same intention may be answered by a ruler, the upper part of which is fixed, and the lower part made to slide; but in this case the upper part must contain two alphabets in succession, that some letter of that part may constantly correspond to one in the lower part. The divisions standing directly over each other in a straight line will be much more obvious than in the circumference of a circle. Or two straight pieces of pasteboard regularly divided, the one containing a single, and the other a double alphabet, would answer exactly the same purpose. In this case a blank space may be left at each end of the single alphabet, and one or two weights being placed on both the pieces will keep them steady.

III. *The corresponding spaces.* Take two pieces of pasteboard or stiff paper, through which you must cut long squares, at different distances, as you will see in the following example. One of these pieces you keep yourself, and the other you give to your correspondent. When you would send him any secret intelligence, you lay the pasteboard upon a paper of the same size, and in the spaces cut out, you write what you would have understood by him only, and then fill up the intermediate spaces with somewhat that makes with those words a different sense.

[I shall be] much obliged to you, as reading [alone] engages my attention [at] present, if you will lend me any one of the [eight] volumes of the Spectator. I hope you will excuse [this] freedom, but for a winter's [evening] I [don't] know a better entertainment. If I [fail] to return it soon, never trust me for the time [to come.]

A paper of this sort may be placed four different ways, either by putting the bottom at the top, or by turning it over; and by these means the superfluous

words may be the more easily adapted to the sense of the others.

This is a very eligible cipher, as it is free from suspicion, but it will do only for short messages; for if the spaces be frequent, it will be very difficult to make the concealed and obvious meanings agree together; and if the sense be not clear, the writing will be liable to suspicion.

IV. *The musical cipher.* The construction of this cipher is similar to that of N° II. The circle EFGH (fig. 3.) is to be divided into twenty-six equal parts, in each part there must be written one of the letters of the alphabet, and on the anterior circle ILMN, moveable round the centre O, there is to be the same number of divisions: the circumference of the inner circle must be ruled in the manner of a music paper; and in each division there is to be placed a note, differing either in figure or position. Lastly, within the musical lines place the three keys, and on the outer circle, the figures that are commonly used to denote the time.

Then provide yourself with a ruled paper, and place one of the keys, as suppose that of *ge re sol*, against the time two-fourths at the beginning of the paper, which will inform your correspondent how to fix his circle. You then copy the notes that answer to the several letters of the words you intend to write, in the manner expressed at fig. 5.

A cipher of this sort may be made more difficult to discover by frequently changing the key, and that will not in the least embarrass the reader. You may likewise add the mark \times or \flat to the note that begins a word, which will make it more easy to read, and at the same time give the music a more natural aspect. This cipher is preferable to that of N° II. above, as it may be inclosed in a letter about common affairs, and pass unsuspected.

CIPPUS, in antiquity, a low column, with an inscription, erected on the high roads, or other places, to show the way to travellers; to serve as a boundary; to mark the grave of a deceased person, &c.

CIR, ST, a village of France, two miles from Versailles, which was remarkable for a nunnery founded by Louis XIV. The nuns were obliged to take care of the education of 250 girls, who could prove their families to have been noble from the 4th generation on the father's side. They could not enter before 7, nor after 12 years of age; and they continued till they were 20 years and 3 months old. The house was formerly a most magnificent structure.

CIRCÆA, ENCHANTER'S NIGHT-SHADE. See BOTANY Index.

CIRCASSIA, a large country of Asia, situated between 45 and 50 degrees of north latitude, and between 40 and 50 of east longitude. It is bounded by Russia on the north; by Astracan and the Caspian sea on the east; by Georgia and Dagistan on the south; and by the river Don, the Palus Mæotis, and the Black sea, on the West. This country has long been celebrated for the extraordinary beauty of its women; and here it was that the practice of inoculating for the smallpox first began. Terki, the principal city, is seated in a very spacious plain, very swampy, towards the sea-side, in 43° 23' north latitude: it is about three wersts in compass, well fortified with ramparts and

Circassia. and bastions in the modern style, well stored with cannon, and has always a considerable garrison in it, under the command of a governor. The Circassian prince who resides here, is allowed 500 Russians for his guard, but none of his own subjects are permitted to dwell within any part of the fortifications. Ever since the reduction of those parts to the obedience of Russia, they have put in all places of strength, not only Russian garrisons and governors, but magistrates, and priests for the exercise of the Christian religion; yet the Circassian Tartars are governed by their own princes, lords, and judges; but these administer justice in the name of the emperor, and in matters of importance, not without the presence of the Russian governors, being all obliged to take the oath of allegiance to his imperial majesty. The apparel of the men of Circassia is much the same with that of the Nagayans, only their caps are something larger; and their cloaks being likewise of coarse cloth or sheep skins, are fastened only at the neck with a string, and as they are not large enough to cover the whole body, they turn them round according to the wind and weather. The men here are much better favoured than those of Nagaya, and the women extremely well shaped, with exceeding fine features, smooth clear complexions, and beautiful black eyes, which, with their black hair hanging in two tresses, one on each side the face, give them a most lovely appearance. They wear a black coil on their heads, covered with a fine white cloth tied under the chin. During the summer they all wear only a smock of divers colours, and that open so low before, that one may see below their navels: this, with their beautiful faces always uncovered (contrary to the custom of most of the other provinces in these parts), their good humour and lively freedom in conversation, altogether render them very attracting: notwithstanding which they have the reputation of being very chaste, though they seldom want opportunity; for according to the accounts of a late traveller, it is an established point of good manners among them, that as soon as any person comes in to speak to the wife, the husband goes out of the house, but whether this continency of theirs proceeds from their own generosity, to recompense their husbands for the confidence they put in them, or has its foundation only in fame, he pretends not to determine. Their language they have in common with the other neighbouring Tartars, although the chief people among them are also not ignorant of the Russian. Their religion is Paganism; for notwithstanding they use circumcision among them, they have neither priest, alcoran, nor mosque, like other Mahometans. Every body here offers his own sacrifice at pleasure; for which, however, they have certain days, established rather by custom than any positive command: their most solemn sacrifice is offered at the death of their nearest friends, upon which occasion both men and women meet in the field to be present at the offering, which is a he-goat; and having killed, they flay it, and stretch the skin with the head and horns on, upon a cross at the top of a long pole, placed commonly in a quickset hedge (to keep the cattle from it); and near the place the sacrifice is offered by boiling and roasting the flesh, which they afterwards eat. When the feast is over, the men rise, and having paid their adoration to the skin, and muttered over certain

prayers, the women withdraw, and the men conclude the ceremony with drinking a great quantity of spirits; and this generally ends in a quarrel before they part. The face of the country is pleasantly diversified with mountains, valleys, woods, lakes, and rivers; and, though not much cultivated, is far from being unfruitful. In summer the inhabitants quit the towns, and encamp in the fields like the neighbouring Tartars, occasionally shifting their stations along with their flocks and herds. Besides game, in which the country greatly abounds, the Circassians eat beef and mutton; but that which they prefer to all others is the flesh of a young horse. Their bread consists of thin cakes of barley meal, baked upon the hearth, which they always eat new; and their usual drink is water or mare's milk, from the latter of which they distil a spirit, as do most of the Tartar nations. They allot no fixed hours for the refreshments of the table or sleep, which they indulge irregularly, as inclination or convenience dictates. When the men make excursions into an enemy's country, they pass several days and nights successively without sleeping; but, at their return, devote as much time to repose as the space in which they had before withheld from that gratification. When they eat, they sit cross-legged on the floor, the skin of some animal serving them instead of a carpet. In removing from one part of the country to another, the women and children are carried in waggons, which are a kind of travelling houses, and drawn by oxen or camels: they never use horses for draught. Their breed of the latter, however, is reckoned exceeding good; and they are accustomed to swim almost any river on horseback. The women and children smoke tobacco as well as the men; and this is the most acceptable commodity which a traveller can carry with him into the Tartar countries. There are here no public inns, which indeed are unnecessary; for so great is the hospitality of the people, that they will contend with each other who shall entertain any stranger that happens to come among them.—The principal branch of their traffic is their own children, especially their daughters, whom they sell for the use of the seraglios in Turkey and Persia, where they frequently marry to great advantage, and make the fortune of their families. The merchants who come from Constantinople to purchase those girls, are generally Jews, who, as well as the mothers, are said to be extremely careful of preserving the chastity of the young women, knowing the value that is set by the Turks upon the marks of virginity. The greater part of the Circassians are Christians of the Greek church; but there are also both Mahometans and Pagans among them.

CIRCE, in fabulous history, a daughter of Sol and Perseis, celebrated for her knowledge of magic and venomous herbs. She was sister to Æetes king of Colchis, and to Pasiphae the wife of Minos. She married a Sarmatian prince of Colchis, whom she murdered to obtain the kingdom. She was expelled by her subjects, and carried by her father upon the coasts of Italy in an island called Ææa. Ulysses, at his return from the Trojan war, visited her coasts, and all his companions, who ran headlong into pleasure and voluptuousness, were changed by Circe's potions into filthy swine. Ulysses, who was fortified against all enchantments by an herb called *moly*, which he had received from Mer-

Circensian
games,
Circle.

cury, went to Circe, and demanded sword in hand the restoration of his companions to their former state. She complied, and loaded the hero with pleasures and honours. In this voluptuous retreat Ulysses had by Circe one son called Telegonus, or two, according to Hesiod, called Agrius and Latinus. For one whole year Ulysses forgot his glory in Circe's arms. At his departure the nymph advised him to descend to hell and to consult the manes of Tiresias concerning the fates that attended him. Circe showed herself cruel to Scylla her rival, and to Picus.

CIRCENSIAN GAMES, a general term under which was comprehended all combats exhibited in the Roman circus, in imitation of the Olympic games in Greece. Most of the feasts of the Romans were accompanied with Circensian games; and the magistrates, and other officers of the republic, frequently presented the people with them, in order to procure their favour. The grand games were held five days, commencing on the 13th of September. See **CIRCUS**.

CIRCLE, in *Geometry*, a plane figure comprehended by a single curve line, called its circumference, to which right lines drawn from a point in the middle, called the centre, are equal to each other. See **GEOMETRY**.

CIRCLES of the Sphere, are such as cut the mundane sphere, and have their periphery either on its moveable surface, or in another immoveable, conterminous, and equidistant surface. See **SPHERE**. Hence arise two kinds of circles, moveable and immoveable. The first, those whose peripheries are in the moveable surface, and which therefore revolve with its diurnal motion; as, the meridians, &c. The latter having their periphery in the immoveable surface, do not revolve; as the ecliptic, equator, and its parallels, &c. See **GEOGRAPHY**.

CIRCLES of Altitude, otherwise called *almucantars*, are circles parallel to the horizon, having their common pole in the zenith, and still diminishing as they approach the zenith. See **ALMUCANTAR**.

Diurnal CIRCLES, are immoveable circles, supposed to be described by the seven stars, and other points of the heavens, in their diurnal rotation round the earth; or rather, in the rotation of the earth round its axis. The diurnal circles are all unequal: the equator is the biggest.

Horary CIRCLES, in *Dialing*, are the lines which show the hours on dials; though these be not drawn circular, but nearly straight. See **DIALING**.

CIRCLES of Latitude, or *Secondaries of the Ecliptic*, are great circles parallel to the plane of the ecliptic, passing through the poles thereof, and through every star and planet. They are so called, because they serve to measure the latitude of the stars, which is nothing but an arch of one of these circles intercepted between the star and the ecliptic. See **LATITUDE**.

CIRCLES of Longitude, are several lesser circles, parallel to the ecliptic; still diminishing, in proportion as they recede from it. On the arches of these circles, the longitude of the stars is reckoned.

CIRCLE of perpetual Apparition, one of the lesser circles, parallel to the equator, described by any point of the sphere touching the northern point of the horizon, and carried about with the diurnal motion. All

the stars included within this circle never set, but are ever visible above the horizon.

CIRCLE of perpetual Occultation, is another circle at a like distance from the equator, and contains all those stars which never appear in our hemisphere. The stars situated between these circles alternately rise and set at certain times.

Polar CIRCLES, are immoveable circles, parallel to the equator, and at a distance from the poles equal to the greatest declination of the ecliptic. That next the northern pole is called the **ARCTIC**; and that next to the southern one the **ANTARCTIC**.

Fairy-CIRCLE. See **FAIRY-CIRCLE**.

Druidical CIRCLES, in British topography, a name given to certain ancient inclosures formed by rude stones circularly arranged, in the manner represented on Plate CXLV. These, it is now generally agreed, were temples, and many writers think also, places of solemn assemblies for councils or elections, and seats of judgment. Mr Borlase is of this opinion. "Instead, therefore (says he), of detaining the reader with a dispute, whether they were places of worship or council, it may with great probability be asserted, that they were used for both purposes; and having for the most part been first dedicated to religion, naturally became afterwards the curiæ and foræ of the same community." These temples, though generally circular, occasionally differ as well in figure as magnitude: with relation to the first, the most simple were composed of one circle: Stonehenge consisted of two circles and two ovals, respectively concentric, whilst that at Botolph near St Just in Cornwall is formed by four intersecting circles. And the great temple at Avebury in Wiltshire, it is said, described the figure of a seraph or fiery flying serpent, represented by circles and right lines. Some besides circles have avenues of stone pillars. Most, if not all of them, have pillars or altars within their penetralia or centre. In the article of magnitude and number of stones, there is the greatest variety, some circles being only twelve feet diameter and formed only of twelve stones, whilst others, such as Stonehenge and Avebury, contained, the first 140, the second 652, and occupied many acres of ground. All these different numbers, measures and arrangements had their pretended reference; either to the astronomical divisions of the year, or some mysteries of the druidical religion. Mr Borlase, however, supposes, that those very small circles, sometimes formed of a low bank of earth, sometimes of stones erect, and frequently of loose small stones thrown together in a circular form, inclosing an area of about three yards diameter, without any larger circle round them, were originally places of burial.

CIRCLE, in *Logic*, or *Logical CIRCLE*, is when the same terms are proved *in orbem* by the same terms; and the parts of the syllogism alternately by each other, both directly and indirectly.

CIRCLES of the Empire, such provinces and principalities of the German empire as have a right to be present at diets. Maximilian I. divided the empire into six, and some years after into ten circles. This last division was confirmed by Charles V. The circles, as they stand in the Imperial Matricula, are as follow: Austria, Burgundy, the Lower Rhine, Bavaria, Upper

Circle.

Circoncellionēs.

per Saxony, Franconia, Swabia, Upper Rhine, Westphalia, and the Lower Saxony.

CIRCONCELLIONĒS, a species of fanatics, so called because they were continually rambling round the houses in the country. They took their rise among the donatists, in the reign of the emperor Constantine. It is incredible what ravages and cruelties these vagabonds committed in Africa through a long series of years. They were illiterate savage peasants, who understood only the Punic language. Intoxicated with a barbarous zeal, they renounced agriculture, professed continence, and assumed the title of "Vindicators of justice, and protectors of the oppressed." To accomplish their mission, they enfranchised slaves, scourged the roads, forced masters to alight from their chariots, and run before their slaves whom they obliged to mount in their place; and discharged debtors, killing the creditors if they refused to cancel the bonds. But the chief objects of their cruelty were the Catholics, and especially those who had renounced donatism. At first they used no swords, because God had forbidden the use of one to Peter; but they were armed with clubs, which they called the *clubs of Israel*, and which they handled in such a manner as to break a man's bones without killing him immediately, so that he languished a long time and then died. When they took away a man's life at once, they looked upon it as a favour. They became less scrupulous afterwards, and made use of all sorts of arms. Their shout was *Praise be to God*. These words in their mouths were the signal of slaughter, more terrible than the roaring of a lion. They had invented an unheard-of punishment; which was to cover with lime diluted with vinegar the eyes of those unhappy wretches whom they had crushed with blows, and covered with wounds, and to abandon them in that condition. Never was a stronger proof what horrors superstition can beget in minds destitute of knowledge and humanity. These brutes, who had made a vow of chastity, gave themselves up to wine and all sorts of impurities, running about with women and young girls as drunk as themselves, whom they called *sacred virgins*, and who often carried proofs of their incontinence. Their chiefs took the name of *Chiefs of the Saints*. After having glutted themselves with blood, they turned their rage upon themselves, and sought death with the same fury with which they gave it to others. Some scrambled up to the tops of rocks, and cast themselves down headlong in multitudes; others burned themselves, or threw themselves into the sea. Those who proposed to acquire the title of martyrs, published it long before, upon which they were feasted and fattened like oxen for the slaughter; after these preparations they set out to be destroyed. Sometimes they gave money to those whom they met, and threatened to murder them if they did not make them martyrs. Theodoret gives an account of a stout young man, who meeting with a troop of these fanatics, consented to kill them, provided he might bind them first; and having by this means put it out of their power to defend themselves, whipped them as long as he was able, and then left them tied in that manner. Their bishops pretended to balance them, but in reality made use of them to intimidate such as might be tempted to forsake their sect; they even honoured

them as saints. They were not, however, able to govern those furious monsters, and more than once found themselves under a necessity of abandoning them, and even of imploring the assistance of the secular power against them. The counts Ursacius and Taurinus were employed to quell them; they destroyed a great number of them, of whom the donatists made as many martyrs. Ursacius, who was a good Catholic and a religious man, having lost his life in an engagement with the barbarians, the donatists did not fail to triumph in his death, as an effect of the vengeance of heaven. Africa was the theatre of these bloody scenes during a great part of Constantine's life.

CIRCUIT, in *Law*, signifies a longer course of proceedings than is needful to recover the thing sued for.

CIRCUIT, also signifies the journey or progress which the judges take twice every year, through the several counties of England and Wales, to hold courts and administer justice, where recourse cannot be had to the king's courts at Westminster; hence England is divided into six circuits, viz. the Home circuit; Norfolk circuit; Midland circuit; Oxford circuit; Western circuit, and Northern circuit. In Wales there are but two circuits, North and South Wales: two judges are assigned by the king's commission to every circuit.

In Scotland, the judges of the supreme criminal court, or court of justiciary, are divided into three separate courts, consisting of two judges each; and the kingdom into as many districts. In certain boroughs of every district, each of these courts by rotation are obliged to hold two courts in the year, in spring and autumn; which are called *circuit-courts*.

Electrical Circuit, denotes the course of the electric fluid from the charged surface of an electric body, to the opposite surface into which the discharge is made. Some of the first electricians apprehended, that the same particles of the electric fluid, which were thrown on one side of the charged glass, actually made the whole circuit of the intervening conductors, and arrived at the opposite side; whereas Dr Franklin's theory only requires, that the redundancy of electric matter on the charged surface should pass into the bodies forming that part of the circuit which is contiguous to it, driving forward that part of the fluid which they naturally possess; and that the deficiency of the exhausted surface should be supplied by the neighbouring conductors, which form the last part of the circuit. On this supposition, a vibrating motion is successively communicated through the whole length of the circuit. This circuit is always formed of the best conductors, let the length of it be ever so great. Many attempts were made, both in France and England, at an early period in the history of electricity, to ascertain the distance to which the electric shock might be carried, and the velocity of its motion. The French philosophers, at different times, made it to pass through a circuit of 900 toises, and of 2000 toises, or about two English miles and a half; and they discharged the Leyden phial through a basin of water, the surface of which was about an acre. And M. Mounier found, that, in passing through an iron wire of 950 toises in length, it did not spend a quar-

Circuit.

Circular, Circulation ter of a second; and that its motion was instantaneous through a wire of 1319 feet. In 1747, Dr Watson, and other English philosophers, after many experiments of a similar kind, conveyed the electric matter through a circuit of four miles; and they concluded from this and another trial, that its velocity is instantaneous.

CIRCULAR, in a general sense, any thing that is described, or moved in a round, as the circumference of a circle, or surface of a globe.

CIRCULAR Numbers, called also *spherical ones*, according to some, are such whose powers terminate in the roots themselves. Thus, for instance, 5 and 6, all whose powers do end in 5 and 6, as the square of 5 is 25; the square of 6 is 36, &c.

CIRCULAR Sailing, is the method of sailing by the arch of a great circle. See NAVIGATION.

CIRCULATION, the act of moving round, or in a circle; thus we say, the circulation of the blood, &c.

CIRCULATION of the Blood, the natural motion of the blood in a living animal, whereby that fluid is alternately carried from the heart into all parts of the body, by the arteries, from whence it is brought back to the heart again by the veins. See ANATOMY Index.

In a foetus, the apparatus for the circulation of the blood is somewhat different from that in adults. The septum, which separates the two auricles of the heart, is pierced through with an aperture, called the *foramen ovale*; and the trunk of the pulmonary artery, a little after it has left the heart, sends out a tube into the descending aorta, called the *communicating canal*. The foetus being born, the foramen ovale closes by degrees, and the canal of communication dries up, and becomes a simple ligament.

As to the velocity of the circulating blood, and the time wherein the circulation is completed, several computations have been made. By Dr Keil's account, the blood is driven out of the heart into the aorta with a velocity which would carry it twenty-five feet in a minute; but this velocity is continually abated in the progress of the blood, in the numerous sections or branches of the arteries; so that before it arrives at the extremities of the body, its motion is greatly diminished. The space of time wherein the whole mass of blood ordinarily circulates is variously determined. Some state it thus: Supposing the heart to make two thousand pulses in an hour, and that at every pulse there is expelled an ounce of blood; as the whole mass of blood is not ordinarily computed to exceed twenty-four pounds, it must be circulated seven or eight times over in the space of an hour.

The curious, in microscopic observations, have found an easy method of seeing the circulation of the blood in the bodies of animals: for these inquiries it is necessary to choose such animals as are small, and easily manageable, and which are either wholly or in part transparent. The observations made by this means are preferable to any others we can have recourse to, since, in dissections, the animal is in a state of pain, or dying; whereas in animals small enough to be thus viewed, all is left in its usual course, and we see what nature does in her own undisturbed method. In these creatures also, after viewing, as long as we please, the natural state and current of the blood, we may, by

pressure, and several other ways, impede its course; and by putting various mixtures into the creature's water, induce a morbid state, and finally see the creature die, either by means of this or by any other method; and we may thus accurately observe all the changes it undergoes, and see what occasions the trembling pulse, &c. of dying people.

The current of the blood in small animals, that is, its passing on through the vessels, either to or from the heart, is very easily seen by the microscope; but its circulation, that is, its running to the extremities of the parts, and thence returning is more difficult; because the vessels where this should be seen are so extremely minute, as not easily to come under observation. The larger arteries are easily distinguished from the veins by the motion of the blood through them, which in the veins is always smooth and regular; but in the arteries by several propulsions after the manner of pulsation. But this difference is not to be found in the more minute vessels, in all which, as well arteries as veins, the motion of the blood is even and regular.

The transparent membrane, or web between the toes of a frog's hinder foot, is a very proper object to observe the circulation of the blood in. The tails or fins of fishes are also very fine objects; and when the fish is very small, these are manageable, and afford a view of a great number of veins and arteries, with a very quick and beautiful succession of blood through them. The tail of a flounder may be very conveniently placed before the double microscope on a plate of glass; and its body being supported by something of equal height, the fish will lie still, and the circulation may be seen very agreeably. In the minutest vessels thus examined, the blood always appears pale or colourless, but in the large ones it is manifestly red. The arteries usually branch out extremely before they join the veins to carry the blood back to the heart; but this is not always the case; for Mr Leuwenhoek has observed, that on each side of the little gillles which give a stiffness to the tail of a flounder, there may be seen a very open communication of the veins and arteries; the blood running towards the extremities through arteries, and returning back again through veins, which were evidently a continuation of those arteries, and of the same diameter with them. The whole fish on the tail of which this examination was made, was not more than half an inch in length; it is easy to conceive, therefore, how small the tail must be; and yet in it there were 68 vessels which carried and returned the blood; and yet these vessels were far from being the most minute of all. How inconceivably numerous then must the *circulations* in the whole human body be? Mr Leuwenhoek is of opinion, that a thousand different circulations are continually carried on in every part of a man's body in the breadth of a finger nail.

The tail of a newt or water-lizard affords also a very entertaining prospect of the circulation of the blood through almost numberless small vessels; but no object shows it so agreeably as one of these animals while so young as not to be above an inch long; for then the whole body is so very transparent, that the circulation may be seen in every part of it, as well as

Circulation in the tail; and, in these objects, nothing is more beautiful than the course of the blood into the toes and back again, where it may be traced all the way with great ease. Near the head there are also found three small fins which afford a very delightful prospect: these are all divided like the leaves of polypody; and in every one of the branches of these, the blood may be very accurately traced, running to the end through the artery, and there returning back again by a vein of the same size, and laid in the same direction; and as the vessels are very numerous and large in this part, and the third or fourth magnifier may be used, there are sometimes seen 30 or 40 channels of running blood at once; and this the more as the globules of blood in the newt are large, and fewer in number, in proportion to the quantity of serum, than in any other animal: and their figure, as they are protruded through the vessels, changes in a very surprising manner. The impetus occasioning the circulation is great enough in some animals to raise the blood six, seven, or eight feet high from the blood-vessel it springs out at, which, however, is far exceeded by that of the sap of a vine in bleeding time, which will sometimes rise 40 feet high.

CIRCULATION of the Sap of Plants. See PLANTS and SAP.

CIRCULATION of the Spirits, or Nervous Fluid. See ANATOMY Index.

CIRCULATION, in Chemistry, is an operation whereby the same vapour, raised by fire, falls back, to be returned and distilled several times.

CIRCULATION of Money. See COMMERCE and MONEY.

Subterranean CIRCULATION. See SPRINGS.

CIRCULUS, in Chemistry, an iron instrument in form of a ring, which being heated red hot, and applied to the necks of retorts and other glass vessels till they grow hot, a few drops of cold water thrown upon them, or a cold blast, will make the necks fly regularly and evenly off.

Another method of doing this is, to tie a thread, first dipt in oil of turpentine, round the place where you would have it break; and then setting fire to the thread, and afterwards sprinkling the place with cold water, the glass will crack exactly where the thread was tied.

CIRCUMAMBIENT, an appellation given to a thing that surrounds another on all sides; chiefly used in speaking of the air.

CIRCUMCELLIONES. See CIRCONCELLIONES.

CIRCUMCISION, the act of cutting off the prepuce; a ceremony in the Jewish and Mahometan religions, wherein they cut off the foreskin of their males, who are to profess the one or the other law.

Circumcision commenced in the time of Abraham; and was the seal of a covenant stipulated between God and him. It was in the year of the world 2178 that Abraham, by divine appointment, circumcised himself and all the males of his family; from which time it became an hereditary practice among his descendants.

The ceremony, however, was not confined to the Jews. Herodotus and Philo Judæus observe, that it obtained also among the Egyptians and Ethiopians.

Herodotus says, that the custom was very ancient among each people; so that there was no determining which of them borrowed it from the other. The same historian relates, that the inhabitants of Colchis also used circumcision; whence he concludes, that they were originally Egyptians. He adds, that the Phœnicians and Syrians were likewise circumcised; that they borrowed the practice from the Egyptians. And lastly, that a little before the time when he wrote, circumcision had passed from Colchis, to the people inhabiting near Thermodon and Parthenius.

Marsham is of opinion, that the Hebrews borrowed circumcision from the Egyptians; and that God was not the first author thereof, citing Diodorus Siculus and Herodotus as evidences on his side. This latter proposition seems directly contrary to the testimony of Moses, who assures us, (Gen. xvii.) that Abraham, though 99 years of age, was not circumcised till he had the express command of God for it. But as to the former position of Marsham, it will admit of more debate. The arguments on both sides may be seen in one view in *Spencer de Legibus Hebræorum, l. 2. c. 4.*

Be this as it will, it is certain the practice of circumcision among the Hebrews differed very considerably from that of the Egyptians. Among the first it was a ceremony of religion, and was performed on the eighth day after the birth of the child. Among the latter, a point of mere decency and cleanliness; and, as some will have it, of physical necessity; and was not performed till the 13th year, and then on girls as well as boys.

Among the Jews, the time for performing this rite was the eighth day, that is, six full days, after the child was born. The law of Moses ordained nothing with respect to the person by whom, the instrument with which, or the manner how, the ceremony was to be performed; the instrument was generally a knife of stone. The child is usually circumcised at home, where the father or godfather holds him in his arms, while the operator takes hold of the prepuce with one hand, and with the other cuts it off; a third person holds a porringer, with sand in it, to catch the blood; then the operator applies his mouth to the part, and, having sucked the blood, spits it into a bowl of wine, and throws a styptic powder upon the wound. This ceremony was usually accompanied with great rejoicings and feasting; and it was at this time that the child was named in presence of the company. The Jews invented several superstitious customs at this ceremony, such as placing three stools, one for the circumcisor, the second for the person who holds the child, and the third for Elijah, who, they say, assists invisibly at the ceremony, &c.

The Jews distinguished their proselytes into two sorts, according as they became circumcised or not: those who submitted to this rite were looked upon as children of Abraham, and obliged to keep the laws of Moses; the uncircumcised were only bound to observe the precepts of Noah, and were called *noachidae*.

The Turks never circumcise till the seventh or eighth year, as having no notion of its being necessary to salvation. The Persians circumcise their boys at 13, and their girls from 9 to 15. Those of Madagascar cut the flesh at three several times, and the most zealous

Circumci- of the relations present catches hold of the preputium
sion and swallows it.

Circumfer- Circumcision is practised on women by cutting off
entor. the foreskin of the clitoris, which bears a near resemblance and analogy to the preputium of the male penis. We are told that the Egyptian captive-women were circumcised; and also the subjects of Prester John.

CIRCUMCISION is also the name of a feast, celebrated on the first of January, in commemoration of the circumcision of our Saviour.

CIRCUMDUCTION, in *Scots Law*. When parties in a suit are allowed a proof of alledgeances; after the time limited by the judge for taking that proof is elapsed, either party may apply for circumduction of the time of proving; the effect of which is, that no proof can afterwards be brought, and the cause must be determined as it stood when circumduction was obtained.

CIRCUMFERENCE, in a general sense, denotes the line or lines bounding a plane figure. However, it is generally used in a more limited sense for the curve line which bounds a circle, and otherwise called a *periphery*; the boundary of a right-lined figure being expressed by the term *perimeter*.

CIRCUMFERENTOR, an instrument used by surveyors for taking angles.

Plate
CSLV.

It consists of a brass index and circle, all of a piece. The index is commonly about 14 inches long, and an inch and a half broad; the diameter of the circle is about seven inches. On this circle is made a chart, whose meridian line answers to the middle of the breadth of the index, and is divided into 360 degrees. There is a brass ring soldered on the circumference of the circle, on which screws another ring, with a flat glass in it, so as to form a kind of box for the needle, suspended on the pivot in the centre of the circle. There are also two sights to screw on, and slide up and down the index, as also a spangle and socket screwed on the back side of the circle for putting the head of the staff in.

Ibid. How to observe the Quantity of an Angle by the Circumferentor. Let it be required to find the quantity of the angle EKG; first place your instrument at K, with the flower-de-luce of the chart towards you; then direct your sights to E, and observe what degrees are cut by the south end of the needle, which let be 296; then, turning the instrument about, direct your sights to G, noting then also what degrees are cut by the south end of the needle, which suppose 247. This done, always subtract the lesser from the greater, as in this example, 247 from 296, the remainder is 49 degrees, which is the true quantity of the angle EKG.

A circumferentor was made by Mr Jones of Holborn on an improved construction. From a very simple contrivance, it is rendered sufficient to take angles with the accuracy of a common theodolite; and by its angles of altitude and depression may be observed as readily as horizontal ones. The improvement chiefly consists in an arm or index (G), so applied to the centre of the compass box, and within it, that, at the time of observing, by only slipping a pin (p) out, the circle of degrees alone may move round, and leave the index

Ibid.

(G) fixed. This index will remain stationary, from its being attached to the socket that screws on the head of the staff. On the end of this index, next the degrees in the box, there is graduated a nonius scale, by which the circle of 360 degrees is subdivided into five minutes or less if desired. To take angles of altitude or depressions, the instrument is turned down on its ball and socket into a perpendicular position, and adjusted to its level by a plumb line (l), that is hung on a pin at the back of the box, and made to coincide with a mark made thereon. Then by looking through the small sight holes (s) purposely made, the angles are shown on the circle of degrees by the nonius as before. The arms (AA) of the instrument slip off (at BB), and the whole packs into a case but $5\frac{1}{2}$ inches square and 3 deep.

Circumflex
Circumlocution.

CIRCUMFLEX, in *Grammar*, an accent, serving to note, or distinguish, a syllable of an intermediate sound between acute and grave; and generally somewhat long.—The Greeks had three accents, the acute, the grave, and the circumflex; formed thus, ' , ' . In Latin, English, French, &c. the circumflex is made thus.—The acute raises the voice, and the grave falls or lowers it: the circumflex is a kind of undulation, or wavering of the voice, between the two. It is seldom used among the moderns, unless to show the omission of a letter which made the syllable long and open; a thing much more frequent in the French than among us: thus they write *pâte* for *paste*; *tête* for *teste*; *fûmes* for *fumes*, &c. They also use the circumflex in the participles; some of their authors writing *conneu*, *peu*, others *connû*, *pû*, &c. Father Buffier is at a loss for the reason of the circumflex on this occasion.

The form of the Greek circumflex was anciently the same with that of ours, viz. ^; being a composition of the other two accents $\grave{\text{a}}$ in one.—But the copists, changing the form of the characters, and introducing the running hand, changed also the form of the circumflex accent; and instead of making a just angle, rounded it off, adding a dash, through too much haste; and thus formed an *s*, laid horizontally, which produced this figure, instead of this.

CIRCUMGYRATION, denotes the whirling motion of any body round a centre; such is that of the planets round the sun.

CIRCUMLOCUTION, an ambages, or tour of words, used either when a proper term is not at hand, to express a thing naturally and immediately by; or when one chooses not to do it, out of respect, or for some other reason. The word comes from *circumloquor*, "I speak about."

CIRCUMLOCUTION, in oratory, is the avoiding of something disagreeable or inconvenient to be expressed in direct terms; by intimating the sense thereof in a kind of paraphrase, so conceived as to soften or break the force thereof.

Thus Cicero, unable to deny that Clodius was slain by Milo, owns it, with this circumlocution, "Milo's servants being prevented from assisting their master, who was reported to be killed by Clodius; they, in his absence, and without his privity, or consent, did what every body would expect from their own servants on such an occasion."

CIRCUMPOLAR

Circumpolar stars
||
Circus.

CIRCUMPOLAR STARS, an appellation given to those stars, which, by reason of their vicinity to the pole, move round it without setting.

CIRCUMPOTATIO, in antiquity, a funeral feast provided in honour of the dead. This was very frequent among the ancient Romans, as well as among the Athenians. Solon at Athens, and the decemviri at Rome, endeavoured to reform this custom, thinking it absurd that mirth and drunkenness should mingle with sorrow and grief.

CIRCUMSCRIBED, in *Geometry*, is said of a figure which is drawn round another figure, so that all its sides or planes touch the inscribed figure.

CIRCUMSCRIPTION, in *Natural Philosophy*, the termination, bounds, or limits, of any natural body.

CIRCUMSTANCE, a particularity, which, though not essential to any action, yet doth some way affect it.

CIRCUMSTANTIAL EVIDENCE, in *Law*, or the doctrine of presumption, takes place next to positive proof: circumstances which either necessarily or usually attend facts of a particular nature, that cannot be demonstratively evinced, are called *presumptions*, and are only to be relied on till the contrary be actually proved.

CIRCUMSTANTIBUS, in *Law*, a term used for supplying and making up the number of jurors (in case any impanelled appear not, or appearing are challenged by any party), by adding to them so many of the persons present as will make up the number, in case they are properly qualified.

CIRCUMVALLATION, or *Line of Circumvallation*, in the art of war, is a trench bordered with a parapet, thrown up quite round the besieger's camp, by way of security against any army that may attempt to relieve the place, as well as to prevent desertion.

CIRCUMVOLUTION, in *Architecture*, denotes the torus of the spiral line of the Ionic order.

CIRCUS, in antiquity, a large building, either round or oval, used for the exhibiting of shows to the people. Some derive the word from *Circe*, to whom Tertullian attributes the invention. Cassiodorus says, *Circus* comes à *circuitu*. The Romans, Servius observes, at first had no other circus but that made by the Tiber on one side, and a palisade of naked swords on the other. Hence, according to Isidore, came the term *ludi circenses, quasi circum enses*. But Scaliger ridicules that etymology.

The Roman circus was a large oblong edifice, arched at one end, encompassed with porticoes, and furnished with rows of seats, placed ascending over each other. In the middle was a kind of foot-bank, or eminence, with obelisks, statues, and posts at each end. This served them for the courses of their *bigæ* and *quadrigæ*. There were no less than ten circuses at Rome: the largest was built by the elder Tarquin, called *Circus Maximus*, between the Aventine, and Palatine mounts. It was so called, either because of its vast circumference, or because the great games were celebrated in it; or again, because it was consecrated to the great gods, viz. to Vertumnus, Neptune, Jupiter, Juno, Minerva, and the Dii Penates of Rome. Dionysius Halicarnassensis says that it was three stadia and a half in length, and four jugera broad; and these

measures, according to Pliny, allowing to the Roman stadia 625 Roman feet, each of which is 12 inches, will give for the length, 2187 Roman feet, or somewhat more than three English furlongs; and as to the breadth, allowing for each of the jugera 240 Roman feet, it will be 960 Roman feet. It was beautified and enlarged by the Roman emperors, so as to seat 250,000 spectators. The most magnificent circuses were those of Augustus and Nero. There are still some remains of the circuses at Rome, at Nîmes, and other places. The Romans were excessively fond of the games exhibited in the circus: witness that verse in Juvenal.

— *Atque duas tantum res anxius optat,
Panem et circenses* —

The Games of the *Circus*, which some call *Circensian Games*, were combats celebrated in the circus, in honour of *Consus* the god of councils; and thence also called *Consualia*. They were also called *Roman Games, Ludi Romani*, either on account of their antiquity, as being coeval with the Roman people, or because established by the Romans; and the games held there, the great games, *ludi magni*, because celebrated with more expence and magnificence than others; and because held in honour of the great god Neptune, who was their *Consus*.—Those who say they were instituted in honour of the sun, confound the *pompa circensis*, or procession of the circus, with the games.

The games of the circus were instituted by Evander, and re-established by Romulus: the pomp, or procession, was only a part of the games, making the prelude thereof, and consisting of a simple cavalcade of chariots. Till the time of the elder Tarquin, they were held in an island of the Tiber; and were called *Roman games*: after that prince had built the circus, they took their name therefrom, as being constantly held there. There were six kinds of exercises in the circus: the first was wrestling, and fighting with swords, with staves, and with pikes; the second was racing; the third, *saltatio*, leaping; the fourth, *disci*, quoits, arrows, and cestus; all which were on foot: the fifth was horse-coursing; the sixth, courses of chariots, whether with two horses or with four. In this last exercise, the combatants were at first divided into two squadrons or quadrils; then into four; each bearing the names of the colours they wore; *fatio alba, ruffea, &c.* At first there were only white and red; then green and blue were added. Domitian added two more colours, but they did not continue. It was Oenomaus who first invented this method of distinguishing the quadrils by colours. The green was for those who represented the earth; the blue for the sea, &c.

CIRENCESTER, an ancient town of Gloucestershire in England. It was strongly fortified with walls and a castle in the time of the Romans. The ruins of the walls and street are, or were lately, to be seen in the adjacent meadows, where many Roman coins, chequered pavements, and inscriptions on marble, have been found. Two of the Roman consular ways cross each other at this town. The fosse-way, which comes from Scotland, passes through this county and town to Totness in Devonshire. The other, called *Irminstreet*, comes from Gloucester, and runs along to Southampton.

Circus,
Cirencester.

Cirenza
||
Cirrus.

ampton. Not many years ago they discovered, by digging in a meadow near the town, an ancient building under ground, 50 feet long, 40 broad, and 4 high, and supported by 100 brick pillars, curiously inlaid with stones of various colours, supposed to have been a Roman bath. Cirencester has now but one church, in the windows of which are the remains of very valuable painted glafs. The town is governed by two high constables, and 14 wards-men, who govern seven distinct wards; and it sends two members to parliament. It has a free-school, a charity-school, with several alms-houses; and is seated on the river Churn, 36 miles north-east of Bristol, and 88 west by north of London. W. Long. 0. 2. N. Lat. 51. 42.

CIRENZA, a city of Naples, capital of the Basilicate, with an archbishop's see. It was formerly a considerable place, but is now of small consequence. It is seated on the river Brandano, at the foot of the Apennine mountains, in E. Long. 16. 44. N. Lat. 40. 48.

CIRO FERRI, an excellent Italian painter and architect, was born at Rome in 1614, and was the disciple of Peter de Cortona, whose designs he imitated with such exactness, that it is difficult to distinguish them. He was esteemed by Pope Alexander VII. and his three successors, and died at Rome in 1689.

CIRRUS, or CIRRHUS, in *Botany*, a clasper or tendril; that fine spiral string or fibre put out from the footstalks, by which some plants, as the ivy and vine, fasten themselves to walls, pales, or trees, for support. The term is synonymous to the capreolus, clavícula, and viticulus of other botanists; and is ranked by Linnaeus among the fulcra, or parts of plants that serve for protection, support, and defence.

Tendrils are sometimes placed opposite to the leaves, as in the vine; sometimes at the side of the footstalk of the leaf, as in the passion flower; and sometimes, as in winged pea, *pisum ocrus*, they are emitted from the leaves themselves. With respect to composition, they are either simple, that is, composed of one fibre or chord, as in the vetch; or compound, that is, consist of two, three, or more, as in the everlasting pea. Bitter sweet, *solanum dulcamara*, bignonia, and ivy, send forth tendrils which plant themselves like roots in the adjacent walls, or the bark of the neighbouring trees. Claspers, says the ingenious Dr Grew, are like trunk-roots, a mean betwixt a root and a trunk, but a compound of both, as may be gathered from their circumvolutions, in which they mutually ascend and descend. In the mounting of the trunk, continues the same author, claspers serve for support. Thus, in vines, the branches being very long, fragile, and slender, would be liable to frequent breaking, unless, by means of their claspers, they were mutually contained together; so that the whole care is divided betwixt the gardener and nature: the former, with his ligaments of leather, secures the main branches; and nature, with those of her own providing, secures the less. Their aptitude to this end is seen in their convolutions, a motion not proper to any other part; and also in their toughness, which is so much the more remarkable, as they are slenderer than the branches from which they proceed. In the trailing of the trunk, tendrils serve

for stabling and shade: thus, in cucumbers, the trunk and branches being long and fragile, would be driven to and fro by the winds, to the great prejudice both of themselves and their tender fruits, were they not, by these ligaments, held fast together, and preserved in association and good fellowship. The same clasps serve likewise for shade, so that a natural arbour is formed by the branches of the cucumber, in the same manner as an artificial one is made by tangling together the twigs of trees, for the branches, by the linking of their clasps, being couched together, the tender fruits lie under the umbrage of a bower made of their own leaves. Most of the pea-bloom flowers have twining clasps, that is, which wind to the right and back again.

CIRRI, in *Ichthyology*, certain oblong and soft appendages, not unlike little worms, hanging from the under jaws or mouths of some fishes: these cirri, commonly translated *beards*, afford marks to distinguish the different species of the fishes on which they are found.

CIRTA, in *Ancient Geography*, the metropolis and royal residence, not far from the river Ampsaga, in the inland parts of Numidia Propria. A colony, surnamed *Colonia Sittianorum*, very rich, when in the hands of Syphax. The colony was led by one P. Sittius, under the auspices of Cæsar, and was surnamed *Julia*. Now called *Constantina*, in Algiers. E. Long. 7. 0. N. Lat. 35. 30.

CISALPINE, any thing on this side the Alps. The Romans divided Gaul and the country now called *Lombardy*, into Cisalpine and Transalpine. That which was Cisalpine with regard to the Romans, is Transalpine with regard to us.

CISLEU, in Hebrew chronology, the ninth month of their ecclesiastical, and third of their civil, year, answering nearly to our November.

CISPADANA GALLIA, in *Ancient Geography*; a district of Italy, to the south of the Po, occupied by the Gauls in the time of the kings of Rome, separated from Liguria on the west, as is thought by the Iria, running from south to north into the Po; bounded on the south by the Apennine, and on the east by the Adriatic. The term is formed analogically, there being much mention in Cicero, Tacitus, Suetonius, and ancient inscriptions, made of the *Transpadani*; which and *Cispadani* are terms used with respect to Rome. Ptolemy calls the *Cispadana* peculiarly *Gallia Togata*, extending between the Po and Apennine, to the Sapis and Rubicon.

CISSA, or CISSUM, in *Ancient Geography*, a town of the Hither Spain, in Lacetania, on the east side of the Iberus, (thought to be *Guiffona*) where the Carthaginians were first defeated by Scipio. Another *Cissa* of Thrace, situated on the river Ægos Potamus, which Scylax seems to call *Cressa*, or *Crissa*; so that the reading is doubtful.

CISSAMPELOS. See *BOTANY Index*. There are two species of this genus, the pareira and caepeba, both natives of the warmest parts of America. The root of the second, applied externally, is said to be an antidote against the bites of venomous serpents. The plant being infused in water, quickly fills the liquor with a mucilaginous substance, which is as thick as jelly;

Cirri
||
Cissampelos.

jelly; whence the name of *freezing-wyth*, by which this genus of plants has been distinguished by the Brazilians.

CISSOID, in *Geometry*, a curve of the second order, first invented by Diocles, whence it is called *the cissoïd of Diocles*. See **FLUXIONS**.

CISSUS, the **WILD-GRAPE**. See **BOTANY Index**.

CISTERCIANS, in *Church-history*, a religious order founded in the 11th century by St Robert, a Benedictine. They became so powerful, that they governed almost all Europe, both in spirituals and temporals. Cardinal de Vitri describing their observances, says, they neither wore skins nor shirts, nor ever ate flesh, except in sickness; and obtained from fish, eggs, milk, and cheese: they lay upon straw-beds, in tunics and cowls; they rose at midnight to prayers; they spent the day in labour, reading, and prayer, and in all their exercises observed a continual silence. The habit of the Cistercian monks is a white robe, in the nature of a cassock, with a black scapulary and hood, and is girt with a wooden girdle. The nuns wear a white tunic, and a black scapulary and girdle.

CISTERN, denotes a subterraneous reservoir of rain-water; or a vessel serving as a receptacle for rain or other water, for the necessary uses of a family. There are likewise lead-cisterns, jar-cisterns, &c.

Authors mention a cistern at Constantinople, the vaults of which are supported by two rows of pillars, 212 in each row, each pillar being two feet in diameter. They are planted circularly, and *in radii* tending to that of the centre.

Anciently there were cisterns all over the country in Palestine. There were some likewise in cities and private houses. As the cities for the most part were built on mountains, and the rains fell regularly in Judea at two seasons in the year only, in spring and autumn, people were obliged to keep water in cisterns in the country for the use of their cattle, and in cities for the conveniency of the inhabitants. There are still cisterns of very large dimensions to be seen in Palestine, some whereof are 150 paces long, and 54 wide. There is one to be seen at Ramah of 32 paces in length, and 28 in breadth. Wells and cisterns, springs and fountains, are generally confounded in scripture-language.

CISTUS, the **ROCK-ROSE**. See **BOTANY Index**.

CITADEL, a place fortified with five or six bastions, built on a convenient ground near a city, that it may command it in case of a rebellion.

CITADELLA, the capital town in the island of Minorca, in the Mediterranean, with a new harbour. This, with the whole island, were taken by General Stanhope and the confederate fleet in 1708, and ceded to Great Britain by the treaty of Utrecht in 1713; but it was taken by the French, after a brave defence, in 1756, and restored by the peace. In 1782, it was taken by the Spaniards, and confirmed to them at the subsequent peace. It is 27 miles west of Port-Mahon. E. Long. 3. 30. N. Lat. 39. 58.

CITADINESCA, in *Natural History*, a name given by some writers to the Florentine marble, which is supposed to represent towns, palaces, ruins, rivers, &c. These delineations are merely accidental, and are commonly much assisted by the imagination, though the

natural lines of a stone may sometimes luckily enough represent the ruins of some ancient building, or the course of a river. In England there is a kind of septaria, or ludus Helmontii, which has sometimes pretty beautiful, though very irregular, delineations of this kind. The Florentine marble, as we see it wrought up in the ornaments of cabinets, &c. owes a great deal to the skill of the workmen, who always pick out the proper pieces from the mass, and dispose them in the work so as to represent what they please.

CITATION, in ecclesiastical courts, is the same with summons in civil courts. See **SUMMONS**.

CITATION, is also a quotation of some law authority, or passage of a book.

CITHÆRON, in *Ancient Geography*, a mountain and forest of Bœotia, celebrated both in fable and song. To the west it ran obliquely, a little above the Sinus Crisæus, taking its rise contiguous to the mountains of Megara and Attica; then levelled into plains, it terminates at Thebes, famous for the fate of Pentheus and Actæon; the former torn by the Bacchæ, the latter by his dogs; as also for the *orgia*, or revels of Bacchus.

CITHARA, in antiquity, a musical instrument, the precise structure of which is not known; some think it resembled the Greek delta Δ ; and others the shape of a half-moon. At first it had only three strings, but the number was at different times increased to 8, to 9, and lastly to 24. It was used in entertainments and private houses, and played upon with a plectrum or quill, like the lyre.

CITHAREXYLON, **FIDDLE-WOOD**. See **BOTANY Index**.

CITIUM, **CETIUM**, or *Cittium*, in *Ancient Geography*, a town of Cyprus, situated in the south of the island, famous for the birth of Zeno, author of the sect called *Stoics*; distant two hundred stadia to the west of Salamis (Diodorus Siculus). A colony of Phœnicians, called *Chetim*: And hence it is that not only Cyprus, but the other islands and many maritime places, are called *Chetim* by the Hebrews; now called *Chiti*.

CITIZEN, a native or inhabitant of a city, vested with the freedom and liberties of it.

A citizen of Rome was distinguished from a stranger, because he belonged to no certain commonwealth subject to the Romans. A citizen is either by birth or election; and sons may derive the right from their fathers. To make a good Roman citizen, it was necessary to be an inhabitant of Rome, to be enrolled in one of the tribes, and to be capable of dignities. Those to whom were granted the rights and privileges of Roman citizens were only honorary citizens. It was not lawful to scourge a citizen of Rome.

CITRINUS, in *Natural History*, the name of a peculiar species of sprig crystal, which is of a beautiful yellow. Many of the common crystals, when in the neighbourhood of lead mines, are liable to be accidentally tinged yellow, by an admixture of the particles of that metal; and all these, whether finer or coarser, have been too frequently confounded together under the name *citrine*; but Dr Hill has ascertained this to be a peculiar species of crystal different from all the others in form as well as in colour; and distinguished by the name of *ellipomacrostylum lucidum flavescens*,

Citron-
tree
||
City.

vescens, pyramide brevi. It is never found colourless like the other crystals, but has great variety of tinges, from that of the deeper ochres to a pale lemon-colour. It is very plentiful in the West Indies, and is sometimes found in Bohemia. Our jewellers have learned from the French and Italians, who are very fond of it, to call it *citrine*; and often cut stones for rings out of it, particularly out of the pyramid, which is always finer than the column; and these, after they have passed through two or three hands, are generally mistaken for topazes.

CITRON-TREE See CITRUS, BOTANY *Index.*

CITRON-Water, a well known strong water or cordial, which may be thus made: Take of fine thin lemon-peel, 18 ounces; of orange-peel, 9 ounces; perfect nutmegs, 4 ounces; the finest and best alcohol 2 gallons and a half. Digest in balneo marie for one night: draw off with a slow fire; then add as much water as will just make the matter milky (which will be about 7 quarts or 2 gallons); and lastly, add 2 pounds of fine sugar. This composition may be improved by fresh elder flowers, hung in a cloth in the head of the still, sprinkled with ambergris in powder, or its essence.

CITRON-Wood, the wood of an American tree, called by the natives *candle-wood*, because, being cut into splinters, it burns like a candle. The tree is frequent in the Leeward islands, and grows to a considerable size: the leaves are like those of the bay-tree, but of a finer green; the flower is sweet, and much like those of the orange; the fruit succeeding these is black, and of the size of a pepper-corn. The trunk is so like the yellow saunders in colour, that there was once an opinion that it was the same tree, and much of it was imported into Europe, and sold as such; but they were soon found to be different; the saunders being of a sweet scent, and but moderately heavy and resinous; but the citron-wood considerably heavy, very oily, and of a strong smell. It is of no known use in medicine; but is used in France and Germany by the turners, being a fine firm-grained wood, and taking a fine polish, and with age becoming of a very beautiful brown.

CITRUS, the CITRON-TREE. See BOTANY *Index.* This genus includes the citron, the lemon, the lime, the orange, of which there are different varieties, the shaddock, and the forbidden fruit.

CITTERN, a musical instrument much resembling the guitar, for which it has been frequently mistaken. Anciently it was called the *cistrum*, and till lately was held in great contempt both in France and Britain. The practice on it being very easy, it was formerly the amusement and recreation of lewd women and their visitors, inasmuch, that in many of the old English dramatic writers, it is made the symbol of a woman that lived by prostitution. It was also the common amusement of waiting customers in barbers shops, as being the most easy of all instruments to play on, and therefore it was thought that almost every body could make use of it.

CITY, according to Cowel, is a town corporate which hath a bishop and cathedral church; and is called *civitas*, *oppidum*, and *urbs*: *civitas*, in regard it is governed by justice and order of magistracy; *oppidum*, because it contains a great number of inhabi-

tants; and *urbs*, because it is in due form surrounded with walls. City.

Kingdoms have been said to contain as many cities as they have seats of archbishops and bishops; but, according to Blount, *city* is a word that hath obtained since the conquest; for, in the time of the Saxons, there were no cities, but all the great towns were called *burghs*, and even London was then called *Londonburgh*, as the capital of Scotland is called *Edinburgh*. And long after the conquest the word *city* is used promiscuously with the *burgh*, as in the charter of Leicester, where it is both called *civitas* and *burgus*; which shows that those writers were mistaken who tell us every city was, or is, a bishop's see. And though the word *city* signifies with us such a town corporate as hath usually a bishop and a cathedral church, yet it is not always so.

As to the ancient state of cities and villages, whilst the feudal policy prevailed, they held of some great lord on whom they depended for protection, and were subject to his arbitrary jurisdiction. The inhabitants were deprived of the natural and most unalienable rights of humanity. They could not dispose of the effects which their own industry had acquired, either by a latter will or by any deed executed during their life. They had no right to appoint guardians for their children during their minority. They were not permitted to marry without purchasing the consent of the lord on whom they depended. If once they had commenced a law-suit, they durst not terminate it by an accommodation, because that would have deprived the lord, on whose court they pleaded, of the perquisites due to him on passing his sentence. Services of various kinds no less disgraceful than oppressive were exacted from them without mercy or moderation. The spirit of industry was checked in some cities by absurd regulations, and in others by unreasonable exactions; nor would the narrow and oppressive maxims of a military aristocracy have permitted it ever to rise to any degree of height or vigour.

The freedom of cities was first established in Italy, owing principally to the introduction of commerce. As soon as they began to turn their attention towards this object, and to conceive some idea of the advantages they might derive from it, they became impatient to shake off the yoke of their insolent lords, and to establish among themselves such a free and equal government as would render property secure and industry flourishing. The German emperors, especially those of the Franconian and Suabian lines, as the seat of their government was far distant from Italy, possessed a feeble and imperfect jurisdiction in that country. Their perpetual quarrels, either with the popes or their own turbulent vassals, diverted their attention from the interior police of Italy, and gave constant employment for their arms. These circumstances induced some of the Italian cities, towards the beginning of the 11th century, to assume new privileges; to unite together more closely, and to form themselves into bodies politic, under the government of laws established by common consent. The rights which many cities acquired by bold or fortunate usurpations, others purchased from the emperors, who deemed themselves gainers when they received large sums for immunities which they were no longer able to withhold; and some cities obtained

Robertson's
Charles VI

City.

tained them gratuitously from the facility or generosity of the princes on whom they depended. The great increase of wealth which the crusades brought into Italy, occasioned a new kind of fermentation and activity in the minds of the people, and excited such a general passion for liberty and independence, that, before the conclusion of the last crusade, all the considerable cities in that country had either purchased or had extorted large immunities from the emperors.

This innovation was not long known in Italy before it made its way into France. Louis the Gros, in order to create some power that might counterbalance those potent vassals who controlled or gave law to the crown, first adopted the plan of conferring new privileges on the towns situated within his own domain. These privileges were called *charters of community*, by which he enfranchised the inhabitants, abolished all marks of servitude, and formed them into corporations or bodies politic, to be governed by a council and magistrates of their own nomination. These magistrates had the right of administering justice within their own precincts; of levying taxes; of embodying and training to arms the militia of the town, which took the field when required by the sovereign under the command of officers appointed by the community. The great barons imitated the example of their monarch, and granted like immunities to the towns within their territories. They had wasted such great sums in their expeditions to the Holy Land, that they were eager to lay hold on this new expedient for raising money by the sale of those charters of liberty. Though the constitution of communities was as repugnant to their maxims of policy as it was adverse to their power, they disregarded remote consequences in order to obtain present relief. In less than two centuries, servitude was abolished in most of the cities of France, and they became free corporations, instead of dependent villages without jurisdiction or privileges. Much about the same period the great cities of Germany began to acquire like immunities, and laid the foundations of their present liberty and independence. The practice spread quickly over Europe, and was adopted in Spain, England, Scotland, and all the other feudal kingdoms.

The Spanish historians are almost entirely silent concerning the origin and progress of communities in that kingdom; so that it is impossible to fix with any degree of certainty, the time and manner of their first introduction there. It appears, however, from Mariana, that in the year 1350 eighteen cities had obtained a seat in the Cortes of Castile. In Arragon, cities seem early to have acquired extensive immunities, together with a share in the legislature. In the year 1118, the citizens of Saragossa had not only obtained political liberty, but they were declared to be of equal rank with the nobles of the second class; and many other immunities, unknown to persons in their rank of life in other parts of Europe, were conferred upon them. In England, the establishment of communities or corporations was posterior to the conquest. The practice was borrowed from France, and the privileges granted by the crown were perfectly similar to those above enumerated. It is not improbable, that some of the towns in England were formed into corporations under the Saxon kings; and that the charters granted by the kings of the Norman race were not charters of enfranchisement from a

state of slavery, but a confirmation of privileges which they had already enjoyed*. The English cities, however, were very inconsiderable in the 12th century. A clear proof of this occurs in the history just referred to. Fitz-Stephen, a contemporary author, gives a description of the city of London in the reign of Henry II. and the terms in which he speaks of its trade, its wealth, and the number of its inhabitants, would suggest no inadequate idea of its state at present, when

it is the greatest and most opulent city in Europe. But all ideas of grandeur and magnificence are merely comparative. It appears from Peter of Blois, archdeacon of London, who flourished in the same reign, and who had good opportunity of being informed, that this city, of which Fitz-Stephen gives such a pompous account, contained no more than 40,000 inhabitants. The other cities were small in proportion, and in no condition to extort any extensive privileges. That the constitution of the boroughs of Scotland in many circumstances resemble that of the towns of France and England, is manifest from the *Leges Burgorum* annexed to the *Regiam Majestatem*.

CIVET, a kind of perfume which bears the name of the animal it is taken from, and to which it is peculiar. See VIVERRA.

Good civet is of a clear, yellowish, or brownish colour; not fluid nor hard, but about the consistence of butter or honey, and uniform throughout; of a very strong smell, quite offensive when undiluted, but agreeable when only a small portion of civet is mixed with a large one of other substances. It unites easily with oils both expressed and distilled, but not at all with water or alcohol; nor can it be rendered miscible with water by the mediation of sugar. The yolk of an egg seems to dispose it to unite with water; but in a very little while the civet separates from the liquor, and falls to the bottom, though it does not prove of such a resinous tenacity as when treated with sugar and alcohol. It communicates, however, some share of its smell both to watery and spirituous liquors: hence a small portion of it is often added in odoriferous tinctures, and suspended in the still-head during the distillation of odoriferous waters and spirits. It is rarely if ever employed for medicinal purposes. The Italians make it an ingredient in perfumed oils, and thus obtain the whole of its scent; for oils wholly dissolve the substance of it. It is very rare, however, to meet with civet unadulterated. The substances usually mixed with it are lard and butter, which agreeing with it in its general properties, render all criteria for distinguishing the adulteration impossible. A great trade of civet is carried on at Calicut, Bassora, and other parts of the Indies, and in Africa, where the animal that produces the perfume is found. Live civet-cats are to be seen also in France and Holland. The French keep them only as a rarity; but the Dutch, who keep a great number, draw the civet from them for sale. It is mostly used by confectioners and perfumers.

CIVET-Cat, the English name of the animal which produces the civet. See VIVERRA, MAMMALIA *Indes*.

CIVIC CROWN, was a crown given by the ancient Romans to any soldier who had saved the life of a citizen in an engagement.

The civic crown was reckoned more honourable than

Civet
||
Civic
crown.

* See Lord
Lytleton's
*History of
Henry II.*
vol. ii.

p. 317.

Cividad
Civil Law.

than any other crown, though composed of no better materials than oak-boughs. Plutarch, in the life of C. M. Coriolanus, accounts as follows for using on this occasion the branches of this tree before all others: because, says he, the oaken wreath being sacred to Jupiter, the great guardian of their city, they thought it the most proper ornament for him who had preserved the life of a citizen. Pliny*, speaking of the honour and privileges conferred on those who had merited this crown, says, "They who had once obtained it, might wear it always." When they appeared at the public spectacles, the senate and people rose to do them honour, and they took their seats on these occasions among the senators. They were not only personally excused from all troublesome offices, but procured the same immunity for their father and grandfather by the father's side.

* Lib. xvi.
cap. 4.

CIVIDAD-DE-LAS-PALMAS, the capital town of the island of Canary, with a bishop's see, and a good harbour. The houses are well built, two stories high, and flat-roofed. The cathedral is a very handsome structure; and the inhabitants are gay and rich. The air is temperate, and free from extremes of heat and cold. It is defended by a small castle seated on a hill. W. Long. 14. 35. N. Lat. 28. 0.

CIVIDAD-Real, a town of Spain, in New Castile, and capital of La Mancha. The inhabitants are noted for dressing leather extremely well for gloves. W. Long. 4. 15. N. Lat. 39. 2.

CIVIDAD Roderigo, a strong and considerable town of Spain, in the kingdom of Leon, with a bishop's see. It is seated in a fertile country, on the river Aquada, in W. Long. 6. 52. N. Lat. 40. 38.

CIVIDAD-di-Friuli, a small but ancient town of Italy, in Friuli, and in the territory of Venice; seated on the river Natifona. E. Long. 13. 25. N. Lat. 46. 15.

CIVIL, in a general sense, something that regards the policy, public good, or peace, of the citizens or subjects of the state; in which sense we say, civil government, civil law, civil right, civil war, &c.

CIVIL, in a popular sense, is applied to a complainant and humane behaviour in the ordinary intercourse of life. See **CIVILITY**.

CIVIL, in a legal sense, is also applied to the ordinary procedure in an action, relating to some pecuniary matter or interest; in which sense it is opposed to criminal.

CIVIL Death, any thing that cuts off a man from civil society; as a condemnation to the galleys, perpetual banishment, condemnation to death, outlawry, and excommunication.

CIVIL Law, is properly the peculiar law of each state, country, or city; but what we usually mean by the civil law, is a body of laws composed out of the best Roman and Grecian laws, compiled from the laws of nature and nations; and, for the most part, received and observed throughout all the Roman dominions for above 1200 years. See **LAW Index**.

It was first brought over into England by Theobald a Norman abbot, who was elected to the see of Canterbury in 1138; and he appointed a professor, viz. Roger surnamed *Vicarius*, in the university of Oxford, to teach it to the people of this country. Nevertheless, it gained ground very slowly. King Stephen issued a proclamation, prohibiting the study of

it. And though the clergy were attached to it, the laity rather wished to preserve the old constitution. However, the zeal and influence of the clergy prevailed; and the civil law required great reputation from the reign of King Stephen to the reign of King Edward the III. both inclusive. Many transcripts of Justinian's institute are to be found in the writings of our ancient authors, particularly of Bracton and Fleta; and Judge Blackstone observes, that the common law would have been lost and overrun by the civil, had it not been for the incident of fixing the court of common pleas in one certain spot, and the forming the profession of the municipal law into an aggregate body.

It is allowed, that the civil law contains all the principles of natural equity; and that nothing can be better calculated to form good sense and sound judgment. Hence, though in several countries it has no other authority but that of reason and justice, it is everywhere referred to for authority. It is not received at this day in any nation without some alterations; and sometimes the feudal law is mixed with it, or general and particular customs; and often ordinances and statutes cut off a great part of it.

In Turkey, the Basilics are only used. In Italy, the canon law and customs have excluded a good part of it. In Venice, custom hath almost an absolute government. In the Milanese, the feudal law, and particular customs, bear sway. In Naples and Sicily, the constitutions and laws of the Lombards are said to prevail. In Germany and Holland, the civil law is esteemed to be the municipal law; but yet many parts of it are there grown obsolete; and others are altered, either by the canon law or a different usage. In Friesland, it is observed with more strictness; but in the northern parts of Germany, the *jus Saxonicum*, *Lubecense*, or *Culmense*, is preferred before it. In Denmark and Sweden, it hath scarce any authority at all. In France, only a part of it is received, and that part is in some places as a customary law; and in those provinces nearest to Italy it is received as a municipal written law. In criminal causes, the civil law is more regarded in France; but the manner of trial is regulated by ordinances and edicts. In Spain and Portugal, the civil law is connected with the *jus regium* and custom. In Scotland, the statutes of the *federunt*, part of the *regiæ majestatis*, and their customs, controul the civil law.

In England, it is used in the ecclesiastical courts, in the high court of admiralty, in the court of chivalry, in the two universities, and in the courts of equity; yet in all these it is restrained and directed by the common law.

CIVIL Society. See **LAW Index**.

CIVIL State, in the British polity, one of the general divisions of the **LATY**, comprehending all orders of men from the highest nobleman to the meanest peasant that are not included under the **MILITARY** or **MARITIME** states; though it may sometimes include individuals of these as well as of the **CLERGY**; since a nobleman, a knight, a gentleman, or a peasant, may become either a divine, a soldier, or a seaman. The division of this state is into **NOBILITY** and **COMMONALTY**. See these articles.

CIVIL War, a war between people of the same state, or the citizens of the same city.

Civil Law
Civil War.

Civil Year
||
Civility.

Civil Year, is the legal year, or annual account of time, which every government appoints to be used within its own dominions; and is so called in contradistinction to the natural year, which is measured exactly by the revolution of the heavenly bodies.

CIVILIAN, in general, denotes something belonging to the civil law; but more especially the doctors and professors thereof are called *civilians*.

CIVILITY, a term used in common life as synonymous with complaisance or good-breeding.

Civility is justly inculcated by didactic writers as a duty of no slight consideration. Without civility, or good-breeding, a court would be the seat of violence and desolation. There, all the passions are in fermentation, because all pursue what but few can obtain; there, if enemies did not embrace, they would stab; there, smiles are often put on to conceal tears; there, mutual services are professed, while mutual injuries are intended; and there, the guile of the serpent simulates the gentleness of the dove. To what a degree must good-breeding adorn the beauty of truth, when it can thus soften the deformity of falsehood? On this subject we have the following elegant observations in Knox's *Essays*, N^o 95.

"However just the complaints of the misery of life, yet great occasions for the display of beneficence and liberality do not often occur. But there is an hourly necessity for the little kind offices of mutual civility. At the same time that they give pleasure to others, they add to our own happiness and improvement. Habitual acts of kindness have a powerful effect in softening the heart. An intercourse with polished and humane company tends to improve the disposition, because it requires a conformity of manners. And it is certain, that a sense of decorum, and of a proper external behaviour, will restrain those whose natural temper would otherwise break out in acrimonious and petulant conversation. Even the affectation of philanthropy will in time contribute to realise it. The pleasure resulting from an act of kindness naturally excites a wish to repeat it; and indeed the general esteem which the character of benevolence procures, is sufficient to induce those to wish for it who act only from the mean motives of self-interest.

"As we are placed in a world where natural evil abounds, we ought to render it supportable to each other as far as human endeavours can avail. All that can add a sweet ingredient to the bitter cup must be infused. Amid the multitude of thorns, every flower that will grow must be cultivated with care. But neither pomp nor power are of themselves able to alleviate the load of life. The heart requires to be soothed by sympathy. A thousand little attentions from all around us are necessary to render our days agreeable. The appearance of neglect in any of those with whom we are connected, chills our bosom with chagrin, or kindles the fire of resentment. Nothing therefore seems so likely to ensure happiness as our mutual endeavours to promote it. Our single endeavours, originating and terminating in ourselves, are usually unsuccessful. Providence has taken care to secure that intercourse which is necessary to the existence of society, by rendering it the greatest sweetener of human life.

"By reciprocal attentions we are enabled to become

beneficent without expence. A smile, an affable address, a look of approbation, are often capable of giving a greater pleasure than pecuniary benefits can bestow. The mere participation of the studies and amusements of others, at the same time that it gratifies ourselves, is often an act of real humanity; because others would not enjoy them without companions. A friendly visit in a solitary hour, is often a greater act of kindness than a valuable present.

"It is really matter of surprise, that those who are distinguished by rank and opulence should ever be unpopular in their neighbourhood. They must know the value of popularity; and surely nothing is more easily obtained by a superior. Their notice confers honour, and the aspiring heart of man is always delighted with distinction. A gracious look from them diffuses happiness on the lower ranks. But it usually happens, that an overgrown rich man is not the favourite of a neighbouring country; and it is unfortunate, that pride or inadvertence often prevent men from acting the godlike part of making others happy, even when they might do it without inconvenience to themselves."

CIVITA-DI-PENNA, an ancient town of Italy, in the kingdom of Naples, and in the Farther Abruzzo, with a bishop's see. It is situated near the river Salino, 25 miles north-east of Aquila. E. Long. 13. 3. N. Lat. 42. 25.

CIVITA-Castellana, a town of Italy, in St Peter's patrimony, seated on a river, which, seven miles from thence, falls into the Tiber. E. Long. 13. 5. N. Lat. 42. 15.

CIVITA Turchino, a place in Italy, about two miles north of the town of Corneto in the patrimony of St Peter. It is a hill of an oblong form, the summit of which is almost one continued plain. From the quantity of medals, intaglios, fragments of inscriptions, &c. that are occasionally found here, this is believed to be the very spot where the ancient and powerful city of Tarquinii once stood. At present it is only one continued field of corn. On the south-east side of it runs the ridge of a hill which unites it to Corneto. This ridge is at least three or four miles in length, and almost entirely covered with artificial hillocks, called by the inhabitants *monti rossi*. About twelve of these hillocks have at different times been opened; and in every one of them have been found several subterranean apartments cut out of the solid rock. These apartments are of various forms and dimensions; some consist of a large outer room, and a small one within; others of a small room, at the first entrance, and a large one within; others are supported by a column of the solid rock left in the centre, with openings on every part. The entrance to them all is by a door about five feet high, by two and a half broad. Some of them have no light but from the door, while others seem to have had a small light from above, through a hole of a pyramidal form. Many of these apartments have an elevated port that runs all round the wall, being a part of the rock left for that purpose. The moveables found in these apartments consist chiefly of Etruscan vases of various forms; in some indeed have been found some plain sarcophagi of stone, with bones in them. The whole of these apartments are stuccoed, and ornamented in various manners;

Civita-di-
Penna
||
Civita Tur-
chino.

Civita-Vecchia
||
Clackmannan.

manners: some indeed are plain; but others, particularly three, are richly adorned, having a double row of Etruscan inscriptions running round the upper part of the walls, and under them a kind of frieze of figures in painting; some have an ornament under the figures, which seems to supply the place of an architrave. The paintings seem to be in fresco; and in general resemble those which are usually seen upon Etruscan vases; though some of them are perhaps superior to any thing as yet seen of the Etruscan art in painting. In general they are slight, but well conceived; and prove, that the artist was capable of producing things more studied and better finished; though, in such a subterraneous situation, the delicacy of a finished work would in a great measure have been thrown away. It is probable, however, that among the immense number of these apartments that yet remain to be opened, many paintings and inscriptions may be found sufficient to form a very useful and entertaining work. At present this great scene of antiquities is almost entirely unknown, even in Rome. Mr Jenkins, resident at Rome, was the first Englishman who visited it.

Civita-Vecchia, a sea-port town of Italy in the patrimony of St Peter, with a good harbour and an arsenal. Here the Pope's galleys are stationed, and it has lately been made a free port; but the air is very unwholesome. E. Long. 12. 31. N. Lat. 45. 5.

CIVOLI, or *CIGOLI*, *Lewis*, an Italian painter, whose family name was *Cardi*, was born at the castle of Cigoli, in Tuscany, in the year 1559. His *ecce homo*, which he performed as a trial of skill with Barocchio and Michael Angelo de Caravaggio, was judged better than those executed by them. He excelled in designing, and was employed by the popes and princes of his time. He died at Rome in 1613.

CIUS, in *Ancient Geography*, a town and river of Bithynia, which gave name to the Sinus Cianus. The town was afterwards called *Prussia*, Cius having been destroyed by Philip father of Perseus, and rebuilt by Prusias king of Bithynia. In the river, Hylas, the favourite boy of Hercules, was drowned; (Apollonius Rhodius).

CLAC, among countrymen. To clack wool, is to cut off the sheep's mark, which makes the weight less, and yields less custom to the king.

CLACKMANNAN, the name of a small shire in Scotland, not exceeding eight miles in length and five in breadth. It is bounded on the south by the frith of Forth; on the north and west by Perthshire; and on the east by Fife. The country is plain and fertile towards the frith, producing corn and pasture in abundance. It likewise yields great quantities of excellent coal, which is exported to England, France, and Holland. It is watered by the rivers Forth and Devan, and joins the shire of Kinross in sending a member alternately to parliament.

Population of the different Parishes in this County at two Periods.

	In 1755.	In 1790—1798.
Alloa, -	5816	4802
Clackmannan,	1913	2528

	In 1755.	In 1790—1798.
Dollar, -	517	510
Tillicoultry,	757	909
	9203	8749
	8749	
	*	
Decrease,	254	

Clackmannan
||
Clamp.

* *Statist. Hist.*

CLACKMANNAN, a small town of Scotland, and capital of the county of that name, is situated on the northern shore of the Forth, in W. Long. 3. 40. N. Lat. 56. 15. It stands on a hill, on the top of which is the castle, commanding a noble prospect. It was long the seat of the chief of the Bruces, who was hereditary sheriff of the county before the jurisdictions were abolished. The large square tower is called after the name of *Robert Bruce*, whose great sword and casque are still preserved here. The hill is prettily wooded; and, with the tower, forms a picturesque object. Clackmannan is still the seat of the Bruces of Kennet.

CLAGENFURT, a strong town of Germany, and capital of Carinthia, situated in E. Long. 13. 56. N. Lat. 46. 50.

CLAGET, *WILLIAM*, an eminent and learned divine, born in 1646. He was preacher to the society of Gray's Inn, which employment he exercised until he died in 1688, being then also one of the king's chaplains. Archbishop Sharp gives him an excellent character; and Bishop Burnet has ranked him among those worthy men whose lives, and labours contributed to rescue the church from the reproaches which the follies of others had drawn upon it. Dr Claget published several things; but his principal work is his "Discourse concerning the Operations of the Holy Spirit:" nor must it be forgotten that he was one of those excellent divines who made a noble stand against the designs of James II. to introduce popery. Four volumes of his sermons were published after his death by his brother Nicholas Claget, archdeacon of Sudbury, father of Nicholas Claget afterwards bishop of Exeter.

CLAIM, in *Law*, a challenge of interest in any thing that is in the possession of another.

CLAIR, obscure. See *CLARO-Obscuro*.

CLAIRAULT, *ALEXIS*, of the French academy of sciences, was one of the most illustrious mathematicians in Europe. He read to the academy in 1726, when he was not 13 years old, "A Memoir upon Four new Geometrical Curves of his own invention;" and supported the character he thus laid a foundation for by various publications from time to time. He published, *Elémens de Géométrie*, 1741, in 8vo; *Elémens d'Algebre*, 1746, in 8vo; *Théorie de la Figure de la Terre*, 1743, in 8vo; *Tables de la Lune*, 1754, in 8vo. He was concerned also in the *Journal des Scavans*, which he furnished with many excellent extracts. He died in 1765. He was one of the academicians who were sent into the north to determine the figure of the earth.

CLAM, in *Zoology*, a shell-fish. See *VENUS*.

CLAMP, a piece of wood joined to another.

CLAMP is likewise the term for a pile of unburnt bricks

Clamp
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Clans.

bricks built up for burning. These clamps are built much after the same manner as arches are built in kilns, viz. with a vacuity betwixt each brick's breadth for the fire to ascend by; but with this difference, that instead of arching, they truss over, or over-span; that is, the end of one brick is laid about half way over the end of another, and so till both sides meet within half a brick's length, and then a binding brick at the top finishes the arch.

CLAMP in a ship, denotes a piece of timber applied to a mast or yard to prevent the wood from burbling; and also a thick plank lying fore and aft under the beams of the first orlop, or second deck, and is the same that the rising timbers are to the deck.

CLAMP-Nails, such nails as are used to fasten on clamps in the building or repairing of ships.

CLAMPETIA, in *Ancient Geography*, a town of the Brutii, one of those which revolted from Hannibal, (Livy); called *Lampetia* by Polybius. Now *Amantia*, or *Mantia*, a town of Calabria Ultra, near the bay of Euphemia. E. Long. 16. 20. N. Lat. 39. 15.

CLAMPING, in joinery, is the fitting a piece of board with the grain to another piece of board cross the grain. Thus the ends of tables are commonly clamped, to prevent their warping.

CLANDESTINE, any thing done without the knowledge of the parties concerned, or without the proper solemnities. Thus a marriage is said to be clandestine, when performed without the publication of bans, the consent of parents, &c.

CLANS, in history, and particularly in that of Scotland. The nations which overran Europe were originally divided into many small tribes; and when they came to parcel out the lands which they had conquered, it was natural for every chieftain to bestow a portion, in the first place, upon those of his own tribe or family. These all held their lands of him; and as the safety of each individual depended on the general union, these small societies clung together, and were distinguished by some common appellation, either patronymical or local, long before the introduction of surnames or ensigns armorial. But when these became common, the descendants and relations of every chieftain assumed the same name and arms with him; other vassals were proud to imitate their example; and by degrees they were communicated to all those who held of the same superior. Thus clanships were formed; and in a generation or two, that consanguinity, which was at first in a great measure imaginary, was believed to be real. An artificial union was converted into a natural one: men willingly followed a leader, whom they regarded both as the superior of their lands and the chief of their blood; and served him not only with the fidelity of vassals, but the affection of friends. In the other feudal kingdoms, we may observe such unions as we have described, imperfectly formed; but in Scotland, whether they were the production of chance, or the effect of policy, or strengthened by their preserving their genealogies both genuine and fabulous, clanships were universal. Such a confederacy might be overcome; it could not be broken; and no change of manner or government has been able, in some parts of the kingdom, to dissolve associations which are founded upon prejudices

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Scotland.

so natural to the human mind. How formidable were nobles at the head of followers, who, counting that cause just and honourable which their chief approved, were ever ready to take the field at his command, and to sacrifice their lives in defence of his person or of his fame! Against such men a king contended with great disadvantage; and that cold service, which money purchases, or authority extorts, was not an equal match for their ardour and zeal.

Some imagine the word *clan* to be only a corruption of the Roman *colonia*; but Mr Whittaker asserts it to be purely British, and to signify a *family*.

CLAP, in *Medicine*, the first stage of the venereal disease, more usually called a *GONORRHOEA*.

CLAP-Net, in birding, a sort of net contrived for the taking of larks with the looking-glass, by the method called *daring* or *doring*. The nets are spread over an even piece of ground, and the larks are invited to the place by other larks fastened down, and by a looking glass composed of five pieces, and fixed in a frame so that it is turned round very swiftly backwards and forwards, by means of a cord pulled by a person at a considerable distance behind a hedge. See *DORING*.

CLAR, or *CLAER*, in *Metallurgy*, bone-ashes perfectly calcined, and finely powdered, kept purposely for covering the insides of *COPPELS*.

CLARAMONT-POWDER, a kind of earth, called *terra de Baira*, from the place where it is found; it is famous at Venice, for its efficacy in stopping hemorrhagies of all kinds, and in curing malignant fevers.

PRECEPT of CLARE CONSTAT, in *Scots Law*, the warrant of a superior for entering and infesting the heir of his former vassal, without the interposition of an inquest.

Nuns of St CLARE, were founded at Assisa in Italy, about the year 1212. These nuns observed the rule of St Francis, and wore habits of the same colour with those of the Franciscan friars; and hence were called *Meneresses*; and their house, without Aldgate, the Minories, where they were settled when first brought over into England, about the year 1293. They had only three houses besides this.

CLARE, a market-town of Suffolk, 13 miles south of Bury. E. Long. 0. 35. N. Lat. 52. 15. It gives the title of earl to the duke of Newcastle.

CLARE is also the capital of a county of the same name in the province of Connaught, in Ireland, situated about 17 miles north-west of Limerick. W. Long. 9. 0. N. Lat. 52. 40.

CLARENCEUX, the second king at arms, so called from the duke of Clarence, to whom he first belonged; for Lionel, 3d son to Edward III. having by his wife the honour of Clare in the county of Thomond, was afterwards declared duke of Clarence; which dukedom afterwards escheating to Edward IV. he made this earl a king at arms. His office is to marshal and dispose of the funerals of all the lower nobility, as baronets, knights, esquires, on the south side of the Trent; whence he is sometimes called *surroy* or *south-roy*, in contradistinction to *norroy*.

CLARENDON, *Constitutions of*, certain constitutions made in the reign of Henry II. A. D. 1164, in a parliament held at Clarendon, whereby the king checked the power of the pope and his clergy, and

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Clarendon greatly narrowed the total exemption they claimed from secular jurisdiction.

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Clarigatio.

CLARENDON, *Earl of*. See HYDE.

CLARENNA, Tabulae, in *Ancient Geography*, a town of Vindelicia, at the confluence of the Lycus and Danube. Now *Rain*, a town of Bavaria, on the south side of the Danube, at the confluence of the Lech. E. Long. 11. 0. N. Lat. 48. 45.

CLARENZA, the capital of a duchy of the same name in the Morea; it is a sea-port town, situated on the Mediterranean. E. Long. 21. 40. N. Lat. 37. 40.

CLARET, a name given by the French to such of their red wines as are not of a deep or high colour. See WINE.

CLARICHORD, or MANICHORD, a musical instrument in form of a spinet.

It has 49 or 50 stops, and 70 strings, which bear on five bridges; the first whereof is the highest, the rest diminishing in proportion. Some of the strings are in unison, their number being greater than that of the stops. There are several little mortoisers for passing the jacks, armed with brass-hooks, which stop and raise the chords instead of the feather used in virginals and spinets; but what distinguishes it most is, that the chords are covered with pieces of cloth, which render the sound sweeter, and deaden it so that it cannot be heard at any considerable distance; whence it comes to be particularly in use among the nuns, who learn to play, and are unwilling to disturb the silence of the dormitory.

CLARIFICATION, the act of cleaning or fining any fluid from all heterogeneous matter or feculencies.

The substances usually employed for clarifying liquors, are whites of eggs, blood, and isinglass. The two first are used for such liquors as are clarified whilst boiling hot; the last for those which are clarified in the cold, such as wines, &c. The whites of eggs are beaten up into a froth, and mixed with the liquor, upon which they unite with and entangle the impure matters that float in it; and presently growing hard by the heat, carry them up to the surface in form of a scum, no longer dissoluble in the liquid. Blood operates in the same manner, and is chiefly used in purifying the brine from which salt is made. Great quantities of isinglass are consumed for fining turbid wines. For this purpose some throw an entire piece, about a quarter of an ounce, into a wine cask; by degrees the glue dissolves, and forms a skin upon the surface, which at length subsiding, carries down with it the feculent matter which floated in the wine. Others previously dissolve the isinglass; and having boiled it down to a slimy consistence, mix it with the liquor, roll the cask strongly about, and then suffer it to stand to settle. Neumann questions the wholesomeness of wines thus purified, and assures us that he himself, after drinking only a few ounces of sack thus clarified, but not settled quite fine, was seized with sickness and vomiting, followed by such a vertigo, that he could not stand upright for a minute together. The giddiness continued with a nausea and want of appetite for several days.

CLARIGATIO, in Roman antiquity, a ceremony that always preceded a formal declaration of war. It was performed in this manner: first four heralds crowned with vervain were sent to demand satisfaction

for the injuries done the Roman state. These heralds taking the gods to witness that their demands were just, one of them, with a clear voice, demanded restitution within a limited time, commonly 33 days, which being expired without restitution made, then the *pater patratus*, or prince of the heralds, proceeded to the enemies frontiers, and declared war.

CLARII APOLLINIS FANUM (Strabo, Pliny), a temple and grove of Apollo, situated between Colophon and Lebedos, in Ionia: called *Claros* (Thucydides, Ovid). The name also of a town and mountain there (Nicander); and of a fountain (Clemens Alexandrinus); the waters of which inspired with prophetic fury. *Clarissus* the epithet of Apollo (Strabo).

CLARION, a kind of trumpet, whose tube is narrower and its tone acuter and shriller than that of the common trumpet. It is said that the clarion, now used among the Moors and Portuguese, who borrowed it from the Moors, served anciently for a treble to several trumpets, which sounded tenor and bass.

CLARISESSES, an order of nuns so called from their founder St Clara or St Clare. (See St CLARE). She was in the town of Assisa in Italy; and having renounced the world to dedicate herself to religion, gave birth to this order in the year 1212; which comprehends not only those nuns that follow the rule of St Francis, according to the strict letter, and without any mitigation, but those likewise who follow the same rule softened and mitigated by several popes. It is at present one of the most flourishing orders of nuns in Europe. After Ferdinand Cortez had conquered Mexico for the king of Spain, Isabella of Portugal, wife of the emperor Charles V. sent thither some nuns of the order of St Clara, who made several settlements there. Near their monasteries were founded communities of Indian young women, to be instructed by the clarisses in religion, and such works as were suitable to persons of their sex. These communities are so considerable that they usually consist of four or five hundred.

CLARKE, DR SAMUEL, a preacher and writer of considerable note in the reign of Charles II. was, during the interregnum, and at the time of the ejection, minister of St Bennet Fink in London. In November 1660, he, in the name of the Presbyterian ministers, presented an address of thanks to the king for his declaration of liberty of conscience. He was one of the commissioners of the Savoy, and behaved on that occasion with great prudence and moderation. He sometimes attended the church as a hearer and communicant, and was much esteemed by all that knew him, for his great probity and industry. The most valuable of his numerous works are said to be his *Lives of the Puritan Divines* and other persons of note, 22 of which are printed in his *Martyrology*; the rest are in his *Lives of sundry eminent Persons in this latter Age*, folio; and his *Marrow of Ecclesiastical History*, in folio and quarto. He died in 1680.

CLARKE, *Samuel*, the son of the former, was fellow of Pembroke-hall in Cambridge; but was ejected from his fellowship for refusing to take the engagements, as he was also afterwards from his rectory of Grendon in Buckinghamshire. He applied himself early to the study of the Scriptures, and his *Annotations on the Bible*, printed together with the sacred text, is highly commended

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commended by Dr Owen, Mr Baxter, and Dr Calamy. He died in 1701, aged 75.

CLARKE, *Dr Samuel*, a very celebrated English divine, was the son of Edward Clarke, Esq. alderman of Norwich, and one of its representatives in parliament for several years; and born there October 11. 1675. He was instructed in classical learning at the free-school of that town; and in 1691 removed thence to Caius college in Cambridge, where his uncommon abilities soon began to display themselves. Though the philosophy of Des Cartes was at that time the established philosophy of the university, yet Clarke easily mastered the new system of Newton; and in order to his first degree of arts, performed a public exercise in the schools upon a question taken from it. He greatly contributed to the establishment of the Newtonian philosophy by an excellent translation of, and notes upon, Rohault's "Physics," which he finished before he was 22 years of age. The system of natural philosophy then generally taught in the university was that written by Rohault, founded altogether upon Cartesian principles, and very ill translated into Latin. Clarke gave a new translation, and added to it such notes as might lead students insensibly and by degrees to other and truer notions than could be found there. "And this certainly (says Bishop Hoadly) was a more prudent method of introducing truth unknown before, than to attempt to throw aside this treatise entirely, and write a new one instead of it. The success answered exceedingly well to his hopes; and he may justly be styled a great benefactor to the university in this attempt. For by this means the true philosophy has, without any noise, prevailed; and to this day his translation of Rohault is, generally speaking, the standing text for lectures, and his notes the first direction to those who are willing to receive the reality and truth of things in the place of invention and romance." Whiston relates, that in 1697, while he was chaplain to Moore bishop of Norwich, he met young Clarke, then wholly unknown to him, at a coffeehouse in that city; where they entered into a conversation about the Cartesian philosophy, particularly Rohault's "Physics," which Clarke's tutor, as he tells us, had put him upon translating. "The result of this conversation was (says Whiston), that I was greatly surpris'd that so young a man as Clarke then was should know so much of those sublime discoveries, which were then almost a secret to all but to a few particular mathematicians. Nor did I remember (continues he) above one or two at the most, whom I had then met with, that seem'd to know so much of that philosophy as Clarke." This translation of Rohault was first printed in 1697, 8vo. There have been four editions of it, in every one of which improvements have been made; especially in the last in 1718, which has the following title: *Jacobi Rohaulti Physica. Latine vertit, recensuit, et uberioribus jam Annotationibus, ex illustrissimi Isaaci Newtoni Philosophia maximam partem hausit, amplificavit et ornavit S. Clarke, S. T. P. Accedunt etiam in hac quarta editione novæ aliquot tabulæ ari incisæ, et Annotationes multum sunt auctæ.* Dr John Clarke, late dean of Sarum, and our author's brother, translated this work into English, and published it in 2 vols 8vo.

Afterwards he turned his thoughts to divinity; and

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in order to fit himself for the sacred function, he studied the Old Testament in the original Hebrew, the New in the original Greek, and the primitive Christian writers. Having taken holy orders, he became chaplain to Moore bishop of Norwich, who was ever after his constant friend and patron. In 1699 he published two treatises: one entitled "Three practical Essays on Baptism, Confirmation, and Repentance;" the other, "Some Reflections on that part of a book called Amyntor, or a Defence of Milton's Life, which relates to the Writings of the Primitive Fathers, and the Canon of the New Testament." In 1701 he published "A Paraphrase upon the Gospel of St Matthew;" which was followed in 1702 by the "Paraphrases upon the Gospels of St Mark and St Luke," and soon after by a third volume "upon St John." They were afterwards printed together in 2 vols 8vo; and have since undergone several editions. He intended to have gone through the remaining books of the New Testament, but something accidentally interrupted the execution.

Meanwhile Bishop Moore gave him the rectory of Drayton near Norwich, and procured for him a parish in that city; and these he served himself in that season when the bishop resided at Norwich. In 1704 he was appointed to preach Boyle's lecture; and the subject he chose was, "The being and attributes of God." He succeeded so well in this, and gave such high satisfaction, that he was appointed to preach the same lecture the next year; when he chose for his subject "The evidences of natural and revealed religion." These sermons were first printed in two distinct volumes; the former in 1705, the latter in 1706. They have since been printed in one volume, under the general title of "A Discourse concerning the Being and Attributes of God, the Obligations of natural Religion, and the Truth and Certainty of the Christian Revelation, in answer to Hobbes, Spinoza, the Author of the *Oscles of Reason*, and other Deniers of natural and revealed Religion." Clarke having endeavoured in the first part of this work to show, that the being of a God may be demonstrated by arguments *à priori*, is unluckily involved in the censure which Pope has passed upon this method of reasoning in the following lines. They are put into the mouth of one of his dunces, addressing himself to the goddess Dulness:

"Let others creep by timid steps and slow,
 "On plain experience lay foundations low,
 "By common sense to common knowledge bred,
 "And lost to nature's cause through nature led.
 "All-seeing in thy mists, we want no guide,
 "Mother of arrogance, and source of pride!
 "We nobly take the high priori road,
 "And reason downward, till we doubt of God."

Dunciad, b. 4. l. 455.

Upon which we have the following note: "Those who, from the effects in this visible world, deduce the eternal power and godhead of the First Cause, though they cannot attain to an adequate idea of the Deity, yet discover so much of him as enables them to see the end of their creation and the means of their happiness: whereas they who take this high priori road, as Hobbes, Spinoza, Des Cartes, and some better reasoners,

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Clarke. foners, for one that goes right, ten lose themselves in mist, or ramble after visions, which deprive them of all sight of their end, and mislead them in the choice of wrong means." Clarke, it is probable, would not have denied this; and the poet perhaps would have spared his better reasoners, and not have joined them with such company, had he recollected our author's apology for using the argument *à priori*. "The argument *à posteriori* (says he) is indeed by far the most generally useful argument, most easy to be understood, and in some degree suited to all capacities; and therefore it ought always to be insisted upon: But for as much as atheistical writers have sometimes opposed the being and attributes of God by such metaphysical reasonings, as can no otherwise be obviated than by arguing *à priori*; therefore this manner of arguing also is useful and necessary in its proper place." To this may be added the answer he made to Mr Whiston upon this occasion, as narrated by the latter in his Historical Memoirs. "When Clarke brought me his book, I was in my garden against St Peter's college in Cambridge, where I then lived. Now I perceived that in these sermons he had dealt a great deal in abstract and metaphysical reasoning. I therefore asked him how he ventured into such subtleties which I never durst meddle with? and showing him a nettle, or some contemptible weed in my garden, I told him that weed contained better arguments for the being and attributes of God than all his metaphysics. Clarke confessed it to be so; but alleged for himself, that since such philosophers as Hobbes and Spinoza had made use of those kind of subtleties against, he thought proper to show that the like way of reasoning might be made better use of on the side of, religion; which reason or excuse I allowed to be not inconsiderable." Undoubtedly, as the present editor of the Biographia Britannica observes, the grand, the proper, the decisive proof of the existence, perfections, and providence of the Deity, must be drawn from his works. On this proof, as being equally satisfactory to the profoundest philosopher and the meanest peasant, the cause of religion will ever stand secure. Nevertheless, if there be such a thing as an argument *à priori*, why may not speculative men be employed in its examination? Several able divines and philosophers have thought, and still think, that this argument for the being and attributes of God will stand the test of the severest scrutiny; and therefore they cannot be blamed for endeavouring to set it in a convincing light to others. As to the merit, indeed, of the whole work under consideration, including the evidences of natural and revealed religion, it is undoubtedly of the first order. Difficulties may be raised on particular points, and the ablest and most candid inquirers may sometimes see cause to hesitate with regard to the validity of the reasoning; but still, in general, the book reflects honour on the age as well as the author that produced it, and will descend, with distinguished reputation, to a late posterity. The defence, in particular, of the sacred original and authority of Christianity is admirably conducted.

In 1706 he published "A Letter to Mr Dodwell;" wherein all the arguments in his epistolary discourse against the immortality of the soul are particularly answered, and the judgment of the fathers, to whom Mr Dodwell had appealed concerning that matter,

truly represented. Bishop Hoadly observes, that in this letter he answered Mr Dodwell in so excellent a manner, both with regard to the philosophical part, and to the opinions of some of the primitive writers, upon whom these doctrines were fixed, that it gave universal satisfaction. But this controversy did not stop here; for the celebrated Collins, coming in as a second to Dodwell, went much farther into the philosophy of the dispute, and indeed seemed to produce all that could possibly be said against the immateriality of the soul, as well as the liberty of human actions. This enlarged the scene of the dispute, into which our author entered, and wrote with such a spirit of clearness and demonstration, as at once showed him greatly superior to his adversaries in metaphysical and physical knowledge, and made every intelligent reader rejoice, that such an incident had happened to provoke and extort from him that plenty of strong reasoning and perspicuity of expression, which were indeed very much wanted upon this intricate and obscure subject. "And I am persuaded (continues the bishop), that as what he has written in this controversy comprehends the little that the ancients had said well, and adds still more evidence than ever clearly appeared before, and all in words that have a meaning to them, it will remain the standard of good sense on that side of the question, on which he spent so many of his thoughts, as upon one of his favourite points." Clarke's letter to Dodwell was soon followed by four defences of it, in four several letters to the author of "A letter to the learned Mr Henry Dodwell, containing some Remarks on a pretended Demonstration of the Immateriality and natural Immortality of the Soul, in Mr Clarke's Answer to his late Epistolary Discourse, &c." They were afterwards all printed together; and the "Answer to Toland's Amyntor" added to them. In the midst of all these labours, he found time to show his regard to mathematical and physical studies, and exact knowledge and skill in them. And his natural affection and capacity for these studies were not a little improved by the friendship of Sir Isaac Newton, at whose request he translated his "Optics" into Latin in 1706. With this version Sir Isaac was so highly pleased, that he presented him with the sum of 500l. or 1000l. for each child, Clarke having then five children.

This year also, Bishop Moore, who had long formed a design of fixing him more conspicuously, procured for him the rectory of St Bennet's, Paul's Wharf, in London; and soon after carried him to court, and recommended him to the favour of Queen Anne. She appointed him one of her chaplains in ordinary; and, in consideration of his great merit, and at the request of the bishop, presented him to the rectory of St James's, Westminster, when it became vacant in 1709. Upon his advancement to this station, he took the degree of D. D. when the public exercise which he performed for it at Cambridge was prodigiously admired. The questions which he maintained were these: 1. "Nullum fidei Christianæ dogma, in sacris scripturis traditum, est rectæ rationi dissentaneum:" that is, "No article of the Christian faith, delivered in the Holy Scriptures, is disagreeable to right reason." 2. "Sine actionum humanarum libertate nulla potest esse religio:" that is, "Without the liberty of human actions

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tions there can be no religion." His thesis was upon the first of these questions, which being thoroughly sifted by that most acute disputant Professor James, he made an extempore reply, in a continued discourse for near half an hour, with so little hesitation, that many of the auditors declared themselves astonished; and owned, that if they had not been within sight of him, they should have supposed him to have read every word of it from a paper. After this, through the course of the syllogistical disputation, he guarded so well against the arts which the professor was a complete master of; replied so readily to the greatest difficulties such an objector could propose; and pressed him so close and hard with clear and intelligible answers, that perhaps there never was such a conflict heard in those schools. The professor, who was a man of humour as well as learning, said to him at the end of the disputation, "Profecto, me probe exercuisti;" that is, "On my word, you have worked me sufficiently;" and the members of the university went away, admiring, as indeed they well might, that a man even of Clarke's abilities, after an absence of so many years, and a long course of business of quite another nature, should acquit himself in such a manner, as if this sort of academical exercise had been his constant employment; and with such fluency and purity of expression, as if he had been accustomed to no other language in conversation but Latin. The same year, 1709, he revised and corrected Whiston's translation of the "Apostolical Constitutions" into English. Whiston tells us, that his own studies having been chiefly upon other things, and having rendered him incapable of being also a critic in words and languages, he desired his great friend and great critic Dr Clarke to revise that translation; which he was so kind as to agree to.

In 1712, he published a most beautiful and pompous edition of Cæsar's commentaries, adorned with elegant sculptures. It is entitled, "C. Julii Cæsaris quæ extant, accuratissimè cum libris editis et mss. optimis collata, recognita, et correctâ; accesserunt annotationes Samuelis Clarke, S. T. P. item indices locorum, rerumque et verborum, utilissimæ." It was printed in 1712, folio; and afterwards in 1720, 8vo. It was dedicated to the great duke of Marlborough, "at a time," says Bishop Hoadly, "when his unequalled victories and successes had raised his glory to the highest pitch abroad, and lessened his interest and favour at home." In the publication of this book, the doctor took particular care of the punctuation. In the annotations, he selected what appeared the best and most judicious in former editors, with some corrections and emendations of his own interspersed. Mr Addison has spoken of this folio edition of Cæsar's commentaries in the following words: "The new edition, which is given us of Cæsar's commentaries, has already been taken notice of in foreign gazettes, and is a work that does honour to the English press. It is no wonder that an edition should be very correct, which has passed through the hands of one of the most accurate, learned, and judicious writers this age has produced. The beauty of the paper, of the character, and of the several cuts with which this noble work is illustrated, makes it the finest book that I have ever seen; and is a true instance of the English genius, which, though it does not come

Clarke.

the first into any art, generally carries it to greater heights than any other country in the world." This noble work has risen in value from that time to the present. A copy of this edition in large paper, most splendidly bound in morocco, was sold at the Hon. Mr Beauclerk's sale for forty-four pounds; and it was said to be purchased by the duke of Grafton. "To a prince or a nobleman (says Dr Harwood), it was a cheap purchase; for it was the most magnificent book I ever beheld." The binding cost Mr Beauclerk five guineas.

The same year, 1712, he published his celebrated book entitled, "The Scripture Doctrine of the Trinity, &c." which is divided into three parts. The first is, a collection and explication of all the texts in the "New Testament," relating to the doctrine of the Trinity: in the second, the foregoing doctrine is set forth at large, and explained in particular and distinct propositions; and in the third, the principal passages in the liturgy of the church of England, relating to the doctrine of the Trinity, are considered. Bishop Hoadly applauds our author's method of proceeding, in forming his sentiments upon so important a point: "He knew (says he), and all men agreed, that it was a matter of mere revelation. He did not therefore retire into his closet, and set himself to invent and forge a plausible hypothesis, which might fit easily upon his mind. He had not recourse to abstract and metaphysical reasonings to cover or patronize any system he might have embraced before. But, as a Christian, he laid open the New Testament before him. He searched out every text in which mention was made of the three persons, or any one of them. He accurately examined the meaning of the words used about every one of them; and by the best rules of grammar and critique, and by his skill in language, he endeavoured to fix plainly what was declared about every person, and what was not. And what he thought to be the truth, he published under the title of 'The Scripture Doctrine of the Trinity.' "I am far (says the bishop) from taking upon me to determine, in so difficult a question between him and those who made replies to him; but this I hope I may be allowed to say, that every Christian divine and layman ought to pay his thanks to Dr Clarke for the method into which he brought this dispute; and for that collection of texts of the New Testament, by which at last it must be decided, on which side soever the truth may be supposed to lie." Whiston informs us, that some time before the publication of this book, there was a message sent to him from Lord Godolphin, and others of Queen Anne's ministers, importing, "That the affairs of the public were with difficulty then kept in the hands of those that were for liberty; that it was therefore an unreasonable time for the publication of a book that would make a great noise and disturbance; and that therefore they desired him to forbear till a fitter opportunity should offer itself;" which message (says he) the doctor had no regard to, but went on according to the dictates of his own conscience with the publication of his book. The ministers, however, were very right in their conjectures; for the work made noise and disturbance enough, and occasioned a great number of books and pamphlets, written by himself and others.

Clarke. Books and pamphlets, however, were not all which the "Scripture Doctrine of the Trinity" occasioned: it made its author obnoxious to the power ecclesiastical, and his book to be complained of by the Lower House of convention. The doctor drew up a preface, and afterwards gave in several explanations, which seemed to satisfy the Upper House; at least the affair was not brought to any issue, the members appearing desirous to prevent dissensions and divisions.

In 1715 and 1716, he had a dispute with the celebrated Leibnitz, relating to the principles of natural philosophy and religion; and a collection of the papers which passed between them was published in 1717. This performance of the Doctor's is inscribed to her late majesty Queen Caroline, then princess of Wales, who was pleased to have the controversy pass through her hands. It related chiefly to the important and difficult subjects of liberty and necessity.

In 1718, Dr Clarke made an alteration in the forms of doxology in the singing psalms, which produced no small noise and disturbance, and occasioned some pamphlets to be written. The alteration was this:

To God, through Christ, his only Son,
Immortal glory be, &c.

And,

To God, through Christ, his Son, our Lord,
All glory be therefore, &c.

A considerable number of these select psalms and hymns having been dispersed by the Society for Promoting Christian Knowledge, before the alteration of the doxologies was taken notice of, he was charged with a design of imposing upon the society; whereas, in truth, the edition of them had been prepared by him for the use of his own parish only, before the society had thoughts of purchasing any of the copies; and as the usual forms of doxology are not established by any legal authority, ecclesiastical or civil, in this he had not offended.

About this time he was presented by the lord Lechmere, the chancellor of the duchy of Lancaster, to the mastership of Wigston's hospital in Leicester. In 1724, he published 17 sermons preached on several occasions, 11 of which were never before printed; and the year following, a sermon, preached at the parish-church of St James's, upon the erecting a charity-school for the education of women servants. In 1727, upon the death of Sir Isaac Newton, he was offered by the court the place of master of the mint, worth *communibus annis* 1200 or 1500*l.* a-year. But to this secular preferment he could not reconcile himself, and therefore absolutely refused it. Whiston seems to wonder, that Clarke's eulogists should lay so little stress upon this refusal, as to mention it not at all, or at least very negligently; while "he takes it," he says, "to be one of the most glorious actions of his life, and to afford undeniable conviction, that he was in earnest in his religion." In 1728, was published, "A Letter from Dr Clarke to Mr Benjamin Hoadly, F. R. S. occasioned by the Controversy, relating to the Proportion of Velocity and Force in Bodies in Motion;" and printed in the Philosophical Transactions, N^o 401.

In 1729, he published the 12 first books of "Homer's Iliad." This edition was printed in 4to, and dedicated to the duke of Cumberland. The Latin

Clarke. version is almost entirely new, and annotations are added to the bottom of the pages. Homer, Bishop Hoadly tells, was Clarke's admired author, even to a degree of something like enthusiasm, hardly natural to his temper; and that in this he went a little beyond the bounds of Horace's judgment, and was so unwilling to allow the favourite poet ever to nod, that he has taken remarkable pains to find out, and give a reason for every passage, word, and title, that could create any suspicion. "The translation, (adds the Bishop), with his corrections, may now be styled accurate, and his notes, as far as they go, are indeed a treasury of grammatical and critical knowledge. He was called to his task by royal command; and he has performed it in such a manner, as to be worthy of the young prince, for whom it was laboured." The year of its publication was the last of this great man's life. Though not robust, he had always enjoyed a firm state of health, without any indisposition bad enough to confine him, except the smallpox in his youth; till, on Sunday May 11. 1729, going out in the morning to preach before the judges at Serjeant's-Inn, he was there seized with a pain in his side, which made it impossible for him to perform the office he was called to; and quickly became so violent, that he was obliged to be carried home. He went to bed, and thought himself so much better in the afternoon, that he would not suffer himself to be bled; against which remedy, it is remarkable that he had entertained strong prejudices. But the pain returning violently about two the next morning, made bleeding absolutely necessary; he appeared to be out of danger, and continued to think himself so, till the Saturday morning following; when, to the inexpressible surprise of all about him, the pain removed from his side to his head; and, after a very short complaint, took away his senses so, that they never returned any more. He continued breathing till between seven and eight of the evening of that day, which was May 17. 1729; and then died, in his 54th year.

Soon after his death were published, from his original manuscripts, by his brother Dr John Clarke, dean of Sarum, "An Exposition of the Church Catechism," and ten volumes of sermons, in 8vo. His "Exposition" is made up of those lectures he read every Thursday morning for some months in the year, at St James's church. In the latter part of his time he revised them with great care, and left them completely prepared for the press. As to the sermons, few discourses in the English language are more judicious, and fewer still are equally instructive. The reasoning and the practical parts are excellent, and the explanations of Scripture are uncommonly valuable. Though Dr Clarke had not the turn of mind which qualified him for moving the passions, and indeed did not make it his object, his sentiments, nevertheless, are frequently expressed with such a clearness of conception and such a force of language, as to produce in well disposed readers all the effect of the pathetic. Several volumes of sermons have been published since his time, which are far superior in point of elegance and beauty, and we have the highest sense of their merit. But still if we were called upon to recommend discourses, which abound with the most solid instruction, and promise the most lasting improvement, we should never forget

Clarke. a Clarke and a Jortin. Three years after the doctor's death appeared also the Twelve Last books of the Iliad, published in 4to by his son Mr Samuel Clarke, who informs us, in the preface, that his father had finished the annotations to the three first of these books, and as far as the 359th verse of the fourth; and had revised the text and version as far as verse 510 of the same book. Dr Clarke married Catharine, the daughter of the Reverend Mr Lockwood, rector of Little Missingham in Norfolk; in whose good sense and unblameable behaviour he was happy to his death. By her he had seven children, two of whom died before and one a few weeks after him.

Of the character of this great divine, the following short delineation appeared some years since in the Gentleman's Magazine: "Samuel Clarke, D. D. rector of St James's, Westminster: in each several part of useful knowledge and critical learning, perhaps without a superior; in all united, certainly without an equal: in his works, the best defender of religion; in his practice, the greatest ornament to it; in his conversation communicative, and in an uncommon manner instructive; in his preaching and writings, strong, clear, and calm; in his life, high in the esteem of the wise, the good, and the great; in his death, lamented by every friend to learning, truth, and virtue." In the same publication some not incurious anecdotes concerning him are printed, collected by the Rev. Mr Jones of Welwyn. We learned from them, that Dr Clarke was of a very humane and tender disposition. When his young children amused themselves with tormenting and killing flies upon the windows, he not only forbade such practices, but calmly reasoned with them, in such a familiar manner, as was calculated to make a powerful impression upon their minds. He was very ready and condescending in answering applications to him with respect to scruples; numberless instances of which occurred in the course of his life. One thing of which Dr Clarke was peculiarly cautious, was not to lose the least minute of his time. He always carried some book about with him, which he would read whilst riding in a coach, or walking in the fields, or if he had any leisure moments free from company or his other studies. Nay, he would read even in company itself, where he might take such a liberty without offence to good manners. His memory was remarkably strong. He told Mr Pyle of Lyn, that he never forgot any thing which he had once thoroughly apprehended and understood. The Doctor, with his intimate friends, was perfectly free and easy; but if strangers were introduced, he behaved with much circumspection, conversing only upon common topics.

When he visited Dr Sykes, his usual way was to sit with him upon a couch, and, reclining upon his bosom, to discourse with him, in the most familiar manner, upon such subjects as were agreeable to the taste and judgment of both. When Sir John Germaine lay upon his deathbed, and was in great confusion and trouble of mind, he sent for Dr Clarke, and requested to know of him whether he should receive the sacrament, and what he should do in his sad condition. The Doctor, who was well acquainted with Sir John's pursuits and course of life, sedately replied, that he could not advise him to receive the sacrament, and

Clarke. that he did not think it likely to be of any avail to him with respect to his final welfare. Having said this, he departed without administering the communion, having first recommended the dying man to the mercy of God.

Dr Clarke was of a cheerful, and even playful disposition. An intimate friend of his, the late Rev. Mr Bott, used to relate, that once when he called upon him, he found him swimming upon a table. At another time, when the two Dr Clarkes, Mr Bott, and several men of ability and learning were together, and amusing themselves with diverting tricks, Dr Samuel Clarke, looking out of the window, saw a grave blockhead approaching to the house; upon which he cried out, "Boys, boys, be wise, here comes a fool." This turn of his mind hath since been confirmed by Dr Warton, who, in his observations on the following line of Mr Pope,

"Unthought of frailties cheat us in the wife,"

says, "Who could imagine that Locke was fond of romances; that Newton once studied astrology; that Dr Clarke valued himself on his agility, and frequently amused himself, in a private room of his house, in leaping over the tables and chairs; and that our author himself was a great epicure?" With respect to what is here recorded of Dr Clarke, we can scarcely persuade ourselves to consider it as a frailty. To be possessed of such a temper as he was, must have been no small degree of happiness; as it probably enabled him to pursue his important and serious studies with greater vivacity and vigour. To be capable of deriving amusement from trivial circumstances, indicates a heart at ease, and may generally be regarded as the concomitant of virtue.

CLARKE, *William*, an English divine, was born at Haghmon-abbey in Shropshire, 1696; and after a grammar-education at Shrewsbury school, was sent to St John's college Cambridge, of which he was elected fellow, Jan. 17. 1716; B. A. 1731, M. A. 1735. He was presented by Archbishop Wake in 1724 to the rectory of Buxted in Suffex, at the particular recommendation of Dr Wotton, whose daughter he married. In 1738 he was made prebendary and residentiary of the cathedral church of Chichester. Some years before this he had given to the public a specimen of his literary abilities, in a preface of his father-in-law Dr Wotton's *Leges Walliæ Ecclesiastica et Civiles Hoeli Boni, et aliorum Walliæ Principum*; or Ecclesiastical and Civil Laws of Howel D Da, and other princes of Wales. There is reason likewise to surmise, that an excellent Discourse on the Commerce of the Romans, which was highly extolled by Dr Taylor in his Elements of the Civil Law, might have been written by our author. It came either from his hand or from that of his friend Mr Bowyer, and is reprinted in that gentleman's Miscellaneous Tracts. But Mr Clarke's chief work was, *The Connexion of the Roman, Saxon, and English Coins; deducing the Antiquities, Customs, and Manners of each people to modern times; particularly the Origin of Feudal Tenures, and of Parliaments; Illustrated throughout with critical and historical Remarks on various Authors, both sacred and profane.* This work was published, in one volume quarto, in 1767; and its appearance from the press was owing to

Clarke. the discovery made by Martin Folkes, Esq. of the old Saxon pound. It was dedicated to the duke of Newcastle, whose beneficent disposition is celebrated for having conferred obligations upon the author, which were not the effects of importunity. Mr Clarke's performance was perused in manuscript by Arthur Onslow, Esq. speaker of the house of commons, who honoured him with some useful hints and observations; but he was chiefly indebted to Mr Bowyer, who took upon him all the care of the publication, drew up several of the notes, wrote part of the dissertation on the Roman sesterce, and formed an admirable index to the whole. By this work our author acquired a great and just reputation. Indeed, it reflects honour upon the country by which it is produced; for there are few performances that are more replete with profound and curious learning. Mr Clarke's last promotions were the chancellorship of the church of Chichester, and the vicarage of Amport, which were bestowed upon him in 1770. These preferments he did not long live to enjoy, departing this life on the 21st of October, in the following year. He had resigned in 1768, the rectory of Buxted to his son Edward. In Mr Nichols's Anecdotes of Bowyer, there are several letters and extracts of letters written to that learned printer by Mr Clarke, which display him to great advantage as a man of piety, a friend, and a scholar.

In a sketch of his character in the *Biographia Britannica*, furnished by Mr Hayley, who was his intimate acquaintance, he is represented as not only a man of extensive erudition, but as possessed of the pleasing talent of communicating his various knowledge in familiar conversation, without any appearance of pedantry or presumption. Antiquities were the favourite study of Mr Clarke, as his publications sufficiently show; but he was a secret, and by no means an unsuccessful, votary of the muses. He wrote English verse with ease, elegance, and spirit. Perhaps there are few better epigrams in our language than the following, which he composed on seeing the words *Domus ultima* inscribed on the vault belonging to the dukes of Richmond in the cathedral of Chichester.

Did he, who thus inscrib'd the wall,
Not read, or not believe, St Paul,
Who says there is, where'er it stands,
Another house not made with hands?
Or, may we gather from these words,
That house is not a house of lords?

Among the happier little pieces of his sportive poetry, there were some animated stanzas, describing the character of the twelve English poets, whose portraits, engraved by Vertue, were the favourite ornament of his parlour: but he set so modest and humble a value on his poetical compositions, that they were seldom committed to paper, and are therefore very imperfectly preserved in the memory of those to whom he sometimes recited them. His taste and judgment in poetry appears indeed very striking in many parts of his learned and elaborate *Connexion of Coins*. His illustration of Nestor's cup, in particular, may be esteemed as one of the happiest examples of that light and beauty which the learning and spirit of an elegant antiquarian may throw on a cloudy and mistaken passage of an ancient poet. In strict attention to all

the duties of his station, in the most active and unwearyed charity, he might be regarded as a model to the ministers of God. Though his income was never large, it was his custom to devote a shilling in every guinea that he received to the service of the poor. As a master, as a husband, and a father, his conduct was amiable and endearing; and to close this imperfect sketch of him with his most striking feature, he was a man of genuine unaffected piety.

CLARO-OBSCURO, or CLAIR-OBSCURE, in painting, the art of distributing to advantage the lights and shades of a piece, both with respect to the easing of the eye and the effect of the whole piece. See PAINTING.

Claro-Obscuro, or *Chiaro-scuro*, is also used to signify a design consisting only of two colours, most usually black and white, but sometimes black and yellow; or it is a design washed only with one colour, the shadows being of a dusky brown, and the lights heightened up by white.

The word is also applied to prints of two colours taken off at twice; whereof there are volumes in the cabinets of those who are curious in prints.

CLARUS, or CLAROS, in *Ancient Geography*, a town of Ionia, famous for an oracle of Apollo. It was built by Mantò, daughter of Tiresias, who fled from Thebes after it had been destroyed by the Epigoni. She was so afflicted with her misfortunes, that a lake was formed with her tears, where she first founded the oracle. Apollo was from thence surnamed *Clarius*. Also an island of the Ægean sea, between Tenedos and Scios.

CLARY. See SALVIA, BOTANY *Index*.

CLARY-Water, is composed of brandy, sugar, clary-flowers, and cinnamon, with a little ambergris dissolved in it. It helps digestion, and is cardiac. This water is rendered either purgative or emetic, by adding resin of jalap and scammony, or *crocus metallorum*. Some make clary-water of brandy, juice of cherries, strawberries, and gooseberries, sugar, cloves, white pepper, and coriander-seeds; infused, sugared, and strained.

CLASMIUM, in *Natural History*, the name of a genus of fossils, of the class of the gypsums; the characters of which are, that they are of a soft texture, and of a dull opaque look, being composed, as all the other gypsums, of irregularly arranged flat particles.

The word is derived from the Greek *κλασμος*, a fragment or small particle; from the flaky small particles of which these bodies are composed. Of this genus there is only one known species: this is of a tolerably regular and even structure; though very coarse and harsh to the touch. It is of a very lively and beautiful red in colour; and is found in thick roundish masses, which, when broken, are to be seen composed of irregular arrangements of flat particles; and emulate a striated texture. It will neither give fire with steel nor ferment with acids; but calcines very freely and easily, and affords a very valuable plaster of Paris, as do all the purer gypsums. It is common in Italy, and is greatly esteemed there; it is also found in some parts of England, particularly Derbyshire, but there it is not much regarded.

CLASPERS, or TENDRILS. See CIRRHUS.

CLASS, an appellation given to the most general subdivisions of any thing: thus, *animal* is subdivided into

Clafs
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Claude.

into the claffes quadrupeds, birds, fishes, &c. which are again fubdivided into feriefes or orders; and thefe laft into genera. See BOTANY.

CLASS, is alfo ufed in fchools, in a fynonymous fenfe with *form*, for a number of boys all learning the fame thing.

CLASSIC, or CLASSICAL, an epithet, chiefly applied to authors read in the claffes at fchools.

This term feems to owe its origin to Tullius Seruius, who, in order to make an estimate of every perfon's eftate, divided the Roman people into fix bands, which he called *claffes*. The eftate of the firft clafs was not to be under 200l. and thefe by way of eminence were called *claffici*, "claffics:" hence authors of the firft rank came to be called *claffics*, all the reft being faid to be *infra claffem*: thus Aristotle is a claffic author in philofophy; Aquinas in fchool divinity, &c.

CLASSICUM was the alarm for battle, given by the Roman generals, and founded by trumpets and other martial mufic throughout the army.

CLATHRI, in antiquity, bars of wood or iron, ufed in fecuring doors and windows. There was a goddefs called *Clathra*, that prefided over the clathri.

CLAVARIA, CLUB-TOP. See BOTANY *Index*.

CLAVARIUM, in antiquity, an allowance the Roman foldiers had for furnifhing nails to fecure their fhoes with. They raifed frequent mutinies, demanding largelfes of the emperors under this pretence.

CLAVATA VESTIMENTA, in antiquity, habits adorned with purple clavi, which were either broad or narrow. See CLAVUS.

CLAUBERG, JOHN, a learned profefor of philofophy and divinity at Duisburg, was born at Solingen in 1622. He travelled into Holland, France, and England, and in each country obtained the eftem of the learned. The eleftor of Brandenburg gave him public testimonies of his eftem. He died in 1665. His works were printed at Amfterdam in 2 vols 4to. The moft celebrated of thefe is his treatife, entitled *Logica vetus et nova*, &c.

CLAUDE le LORRAIN, or CLAUDE GELEE, a celebrated landscape painter, and a ftriking example of the efficacy of induftry to fupply, or at leaft to call forth, genius. Claude was born in the diocefe of Toul in Lorraine in 1600; and, being dull and heavy at fchool, was put an apprentice to a pastry-cook: he afterwards rambled to Rome to feek a livelihood; but, being very ill-bred, and unacquainted with the language, nobody cared to employ him. Chance threw him at laft in the way of Auguftin Taffi, a painter, who hired him to grind his colours, and to do all the houfehold drudgery. His mafter hoping to make him ferviceable to him in fome of his greateft works, taught him by degrees the rules of perspective and the elements of defign. Claude at firft did not know what to make of thefe principles of art; but being encouraged, and not failing in application, he came at length to underftand them. Then his foul enlarged itfelf apace, and cultivated the art with wonderful eagernels. He exerted his utmoft induftry to explore the true principles of painting by an inceffant examination of nature, that genuine fource of excellence; for which purpofe, he made his ftudies in the open fields; where he very frequently continued from funrife till the dusk of

the evening compelled him to withdraw himfelf from his contemplations. It was his cuftom to fketch whatever he thought beautiful or ftriking; and every curious tinge of light, on all kinds of objects, he marked in his fketches, with a fimilar colour; from which he perfected his landscapes with fuch a look of real nature, and gave them fuch an appearance of truth, as proved fuperior to any artift that had ever painted in that fyle.

The beauties of his paintings are derived from nature herfelf, which he examined with uncommon afiduity; and Sandrart relates, that Claude ufed to explain to him, as they walked through the fields, the caufes of the different appearances of the fame profpect at different hours of the day, from the reflections or refractions of light, from dews or vapours in the evening or morning, with all the precifion of a philofopher. He worked on his pictures with great care, endeavouring to bring them to perfection, by touching them frequently over again; and if any performance did not anfwer his idea, it was customary with him to alter, to deface, and repaint it feveral times over, till it correponded with the image pictured in his mind. But whatever ftruck his imagination, while he obferved nature abroad, it was fo ftrongly impreffed on his memory, that on his return to his work, he never failed to make the happieft ufe of it.

His fkies are warm and full of luftre, and every object is properly illumined. His diftances are admirable, and in every part a delightful union and harmony not only excite our applaufe but our admiration. His invention is pleafing, his colouring delicate, and his tints have fuch an agreeable fweetnefs and variety, as have been but imperfectly imitated by the beft fubfequent artifts, but were never equalled. He frequently gave an uncommon tendernels to his finifhed trees by glazing; and in his large compofitions which he painted in frefco, he was fo exact that the diftinct fpecies of every tree might readily be diftinguifhed. As to his figures, when he painted them himfelf, they are very indifferent; but he was fo confcious of his deficiency in this refpect, that he ufually engaged other artifts who were eminent to paint them for him; of which number were Courtois and Philippo Laura. His pictures are now very rare, efpecially fuch as are undamaged; and thofe are at this time fo valued, that no price, howéver great, is thought to be fuperior to their merit. In order to avoid a repetition of the fame fubject, and alfo to detect fuch copies of his works as might be injurious to his fame, by being fold for originals, it was his cuftom to draw (in a paper-book prepared for this purpofe) the defigns of all thofe pictures which were tranfmitted to different countries; and on the back of the drawings, he wrote the name of the perfon who had been the purchafers. That book, which he titled *Libro di Verita*, is now in the poffeffion of the duke of Devonfhire.

CLAUDE, *John*, a Proteftant divine, born in the province of Angenois in 1619. Mefl. de Port Royal ufig their utmoft endeavours to convert M. de Turenne to the Catholic faith, prefented him with a piece calculated to that end, which his lady engaged Mr Claude to anfwer; and his performance gave rife to the moft famous controverfy that was ever carried on in France between the Roman Catholics and Proteftants.

Claude.

Claudia
||
Claudianus.

stants. On the revocation of the edict of Nantz, he retired to Holland, where he met with a kind reception, and was honoured with a considerable pension by the prince of Orange. He died in 1687; and left a son, Isaac Claude, whom he lived to see minister of the Walloon church at the Hague, and who published several excellent works of his deceased father.

CLAUDIA, a vestal virgin at Rome, who being suspected of unchastity, is said to have been cleared from that imputation in the following manner: the image of Cybele being brought out of Phrygia to Rome in a barge, and it happening to stick so fast in the river Tiber that it could not be moved, she tying her girdle, the badge of chastity, to the barge, drew it along to the city, which a thousand men were unable to do.

CLAUDIA *Aqua* (Frontinus), water conveyed to Rome by a canal or aqueduct of eleven miles in length, the contrivance of Appius Claudius the censor, and the first structure of the kind, in the year of Rome 441. Called also *Aqua Appia*.

CLAUDIA *Copia* (Inscriptions), a name of *Lugdunum*, or Lyons in France, the birth-place of the emperor Claudius: A Roman colony called *Claudia*, from its benefactor the emperor; and *Copia*, from its plenty of all necessaries, especially corn. See LUGDUNUM.

CLAUDIA, or *Clodia Via* (Ovid), was that road which, beginning at the Pons Milvius, joined the Flaminia, passing through Etruria on the south side of the Lacus Sabatinus, and striking off from the Cassia, and leading to Luca (Antonine): large remains of it are to be seen above Bracciano (Holstenius).

CLAUDIA *Lex, de Comitibus*, was enacted by M. Cl. Marcellus in the year of Rome 702. It ordained, that at public elections of magistrates no notice should be taken of the votes of such as were absent. Another, *de Usura*, which forbade people to lend money to minors on condition of payment, after the decease of their parents. Another, *de Negotiatione*, by Q. Claudius the tribune, 535. It forbade any senator or father of a senator to have any vessel containing above 300 amphoræ, for fear of their engaging themselves in commercial schemes. The same law also forbade the same thing to the scribes and the attendants of the questors, as it was naturally supposed that people who had any commercial connexions could not be faithful to their trust nor promote the interest of the state. Another, 576, to permit the allies to return to their respective cities, after their names were enrolled. Liv. 41. c. 8. Another, to take away the freedom of the city of Rome from the colonists which Cæsar had carried to Novicomum.

CLAUDIANUS, CLAUDIUS, a Latin poet, flourished in the 4th century, under the emperor Theodosius, and under his sons Arcadius and Honorius. It is not agreed of what country he was a native; but he came to Rome in the year of Christ 395, when he was about 30 years old; and there insinuated himself into Stilicho's favour; who, being a person of great abilities both for civil and military affairs, though a Goth by birth, was so considerable a person under Honorius, that he may be said for many years to have governed the western empire. Stilicho afterwards fell into disgrace, and was put to death; and it is more than probable that the poet was involved in the mis-

Claudius
||
Clavius.

fortunes of his patron, and severely persecuted in his person and fortunes by Hadrian, an Egyptian by birth, who was captain of the guards to Honorius, and succeeded Stilicho. There is reason, however, to think that he rose afterwards to great favour, and obtained several honours both civil and military. The princess Serena had a great esteem for Claudian, and recommended and married him to a lady of great quality and fortune in Libya. There are a few little poems on sacred subjects, which through mistake have been ascribed by some critics to Claudian; and so have made him be thought a Christian. But St Austin, who was contemporary with him, expressly says that he was a Heathen. The time of Claudian's death is uncertain, nor do we know any further particulars of his life than what are to be collected from his works, and which we have already related above. He is thought to have more of Virgil in his style than all the other imitators of him.

CLAUDIUS I. Roman emperor, A. D. 41. The beginning of his reign was very promising; but it was soon discovered that little better than an idiot filled the throne, who might easily be made a tyrant: accordingly he became a very cruel one, through the influence of his empress, the infamous Messalina: after her death, he married his niece Agrippina, who caused him to be poisoned to make room for Nero, A. D. 54. See (*History of*) ROME.

CLAUDIUS II. *Aurelius*, surnamed *Gothicus*, signalized himself by his courage and prudence under the reigns of Valerian and Julian; and on the death of the latter was declared emperor in 268. He put to death Aureolus, the murderer of Gallienus; defeated the Germans; and in 269 marched against the Goths, who ravaged the empire with an army of 300,000 men, which he at first defeated, and the next year entirely defeated; but a contagious disease, which had spread through that vast army, was caught by the Romans; and the emperor himself died of it a short time after, aged 56. Pollio says, that this prince had the moderation of Augustus, the virtue of Trajan, and the piety of Antoninus.

CLAVES *INSULÆ*, a term used in the isle of Man, where all weighty and ambiguous causes are referred to a jury of twelve, who are called *claves insulæ*, the keys of the island.

CLAVICHORD, and CLAVICITHERIUM, two musical instruments used in the 16th century. They were of the nature of the spinet, but of an oblong figure. The first is still used by the nuns in convents; and that the practitioners may not disturb the sisters in the dormitory, the strings are muffled with small bits of fine woollen cloth.

CLAVICLE. See ANATOMY *Index*.

CLAVICYMBALUM, in antiquity, a musical instrument with 30 strings. Modern writers apply the name to our harpsichords.

CLAVI *VESTIUM*, were flowers or studs of purple, interwoven with or sewed upon the garments of knights or senators; only, for distinction, the former used them narrow, the latter broad.

CLAVIS properly signifies a KEY; and is sometimes used in English to denote an explanation of some obscure passages of any book or writing.

CLAVIUS, CHRISTOPHER, a German Jesuit, born

Clause
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Clay-lands.

born at Bamberg, excelled in the knowledge of the mathematics, and was one of the chief persons employed to rectify the kalendar; the defence of which he also undertook against those who censured it, especially Scaliger. He died at Rome in 1612, aged 75. His works have been printed in five volumes folio; the principal of which is his Commentary on Euclid's Elements.

CLAUSE, in *Grammar*, denotes a member of a period or sentence.

CLAUSE signifies also an article or particular stipulation in a contract, a charge or condition in a testament, &c.

CLAUSENBURG, a large city of Transylvania, situated on the river Samos, in E. Long. 23. 20. N. Lat. 46. 53.

CLAVUS, in antiquity, an ornament upon the robes of the Roman senators and knights, which was more or less broad, according to the dignity of the person; hence the distinction of tunica angust-clavia and lati-clavia.

CLAVUS, in *Medicine and Surgery*, is used in several significations: 1. Clavus hystericus, is a shooting pain in the head, between the pericranium and cranium, which affects such as have the green sickness. 2. Clavus oculorum, according to Celsus, is a callous tubercle on the white of the eye, taking its denomination from its figure. 3. Clavus imports indurated tubercles of the uterus. 4. It also imports a surgical instrument of gold, mentioned by Amatus Lusitanus, designed to be introduced into an exulcerated palate, for the better articulation of the voice. And, 5. It signifies a callus, or corn on the foot.

Clavus Annalis, in antiquity. So rude and ignorant were the Romans towards the rise of their state, that the driving or fixing a nail was the only method they had of keeping a register of time; for which reason it was called *clavus annalis*. There was an ancient law, ordaining the chief prætor to fix a nail every year on the Ides of September; it was driven into the right side of the temple of Jupiter Opt. Max. towards Minerva's temple. This custom of keeping an account of time by means of fixing nails was not peculiar to the Romans; for the Etrurians used likewise to drive nails into the temple of their goddess Nortia with the same view.

CLAW, among zoologists, denotes the sharp-pointed nails with which the feet of certain quadrupeds and birds are furnished.

CLAY, in *Natural History*, a genus of earths, the characters of which are these: They are firmly coherent, weighty, and compact; stiff, viscid, and ductile to a great degree, while moist; smooth to the touch; not easily breaking between the fingers, nor readily diffusible in water; and, when mixed, not readily subsiding from it. See *CHEMISTRY* and *MINERALOGY Index*.

CLAY, a town of Norfolk in England, seated on an arm of the sea between two rivers, in E. Long. o. 30. N. Lat. 47. 28.

Clay-Lands, those abounding with clay, whether black, blue, yellow, white, &c. of which the black and the yellow are the best for corn.

All clay-foils are apt to chill the plants growing on them in moist seasons, as they retain too much water: in dry seasons, on the contrary, they turn hard and

choke the plants. The natural produce of clay foils is goose-grass, large daisies, thistles, docks, poppies, &c. Some bear clover and rye-grass; and, if well manured, produce the best grain: they hold manure the best of all lands; and the most proper for them are horse-dung, pigeons-dung, some kinds of marle, folding of sheep, malt-dust, ashes, chalk, lime, foot, &c.

CLAYTON, Dr ROBERT, a prelate of great learning, of distinguished worth and probity, and a respectable member of the Royal and Antiquarian Societies at London, was advanced to the bishopric of Killala, Jan. 23. 1729; translated to the see of Corke, Dec. 19. 1735; to that of Clogher, Aug. 26. 1745; and died much lamented, Feb. 25. 1758. His publications are, 1. A Letter in the Philosophical Transactions, n° 461, p. 813, giving an account of a Frenchman 70 years old (at Inishanan, in his diocese of Corke), who said he gave suck to a child.—2. The Chronology of the Hebrew Bible vindicated, &c. 1751, 4to.—3. An impartial Inquiry into the Time of the Coming of the Messiah, 1751, 8vo.—4. An Essay on Spirit, 1751, 8vo.—5. A Vindication of the Histories of the Old and New Testament, in Answer to the Objections of the late Lord Bolingbroke; in Two Letters to a young Nobleman, 1752, 8vo, reprinted in 1753.—6. A Defence of the Essay on Spirit, with Remarks on the several pretended Answers; and which may serve as an Antidote against all that shall ever appear against it, 1753, 8vo.—7. A Journal from Grand Cairo to Mount Sinai, and back again, translated from a Manuscript, written by the Prefetto of Egypt, in Company with some Missionaries *de propagandâ fide* at Grand Cairo: to which are added, Remarks on the Origin of Hieroglyphics, and the Mythology of the ancient Heathens, 1753, 8vo. two editions 4to and 8vo. It was soon after this publication that his Lordship became (in March 1754) a fellow of the Society of Antiquarians.—8. some Thoughts on Self-love, Innate Ideas, Free-will, Taite, Sentiments, Liberty, and Necessity, &c. occasioned by reading Mr Hume's Works, and the short Treatise written in French by Lord Bolingbroke on Compassion, 1754, 8vo.—9. A Vindication of the Histories of the Old and New Testament, Part II. Adorned with several Explanatory Cuts, 1754, 8vo.—10. Letters between the bishop of Clogher and Mr William Penn, concerning Baptism, 1755, 8vo.—11. A Speech made in the House of Lords in Ireland, on Monday, February, 2. 1756, for omitting the Nicene and Athanasian Creeds out of the Liturgy, &c. 1756, 8vo.—12. A Vindication, Part III. 1758, 8vo. The three parts of the Essay on Spirit were reprinted by Mr Bowyer, in one vol, 8vo, 1759; with some additional notes, and an index of texts of Scripture illustrated or explained.

CLAYTONIA. See *BOTANY Index*.

CLAZOMENÆ, -ARUM, (Herodotus, Strabo, Vel-leius, Pliny); *Clazomena*, α, (Mela); one of the twelve ancient cities of Ionia. The country of Anaxagoras; situated in the neighbourhood of Colophon. The city was small, its port on the N. N. W. side of the island. Dr Chandler informs us, that traces of the walls are found by the sea; and in a hill are vestiges of a theatre. Three or four trees grow on it; and

Clayton
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Clazome-
næ.

Cleanthes by one is a cave hewn in the rock, and affording water. **Cleevers.** A vaulted room with a chimney at one end, and a hovel or two made with stones piled, are all the present structures; and these are chiefly frequented by fishermen and by persons employed to watch and to drive away birds when the grain ripens. Referring to this confined situation of Clazomenæ, a famous sophist, when importuned to adorn his native city by residing in it rather than at Smyrna, replied, *The nightingale refuses to sing in a cage.*

CLEANTHES, a Stoic philosopher, disciple of Zeno, flourished 240 years before Christ. He maintained himself in the day by working in the night; being questioned by the magistrates how he subsisted, he brought a woman for whom he kneaded bread, and a gardener for whom he drew water; and refused a present from them. He composed several works, of which there are now only a few fragments remaining.

CLEAR, as a naval term, is variously applied to the weather, the sea-coasts, cordage, navigation, &c. The weather is said to be clear when it is fair and open, as opposed to cloudy or foggy. The sea-coast is called clear when the navigation is not interrupted, or rendered dangerous by rocks, sands, or breakers, &c. It is expressed of cordage, cables, &c. when they are unembarrassed or disentangled, so as to be ready for immediate service. It is usually opposed to *foul* in all these senses.

CLEARCHUS, a tyrant of Heraclea in Pontus, who was killed by Chion and Leonidas, Plato's pupils, during the celebration of the festivals of Bacchus. He had enjoyed the sovereign power during 12 years. A Lacedæmonian sent to quiet the Byzantines. He was recalled, but refused to obey, and fled to Cyrus the younger, who made him captain of 13,000 Greek soldiers. He obtained a victory over Artaxerxes, who was so enraged at the defeat, that when Clearchus fell into his hands by the treachery of Tissaphernes, he put him immediately to death.

CLEATS, in naval affairs, pieces of wood having one or two projecting ends whereby to fasten the ropes: some of them are fastened to the shrouds below for this purpose, and others nailed to different places of the ship's deck or sides.

CLECHE, in *Heraldry*, a kind of cross, charged with another cross of the same figure, but of the colour of the field.

CLEDGE, among miners, denotes the upper stratum of fullers earth.

CLEDONISM, **CLEDONISMUS**, a kind of divination, in use among the ancients. The word is formed from *κλεδων* which signifies two things, *rumor*, "a report," and *avis*, "a bird." In the first sense, cledonism should denote a kind of divination drawn from words occasionally uttered. Cicero observes, that the Pythagoreans made observation not only of the words of the gods, but of those of men; and accordingly believed the pronouncing of certain words, e. g. *incendium*, at a meal, very unhappy. Thus, instead of prison, they used the word *domicilium*; and to avoid *erinyes*, furies, said *eumenides*. In the second sense, *clodonism* should seem a divination drawn from birds; the same with ornithomantia.

CLEEVERS. See **CLIVERS.**

CLEF, or **CLIFF**, in *Music*, derived from the Latin word *clavis*, "a key;" because by it is expressed the fundamental found in the diatonic scale, which requires a determined succession of tones or semitones, whether major or minor, peculiar to the note from whence we set out, and resulting from its position in the scale. Hence, as it opens a way to this succession, and discovers it, the technical term *key* is used with great propriety. But clefs rather point out the position of different musical parts in the general system, and the relations which they bear one to another.

A clef, says Rousseau, is a character in music placed at the beginning of a stave, to determine the degree of elevation occupied by that stave in the general claviary or system, and to point out the names of all the notes which it contains in the line of that clef.

Anciently the letters by which the notes of the gamut were signified were called *clefs*. Thus the letter A was the clef of the note *la*, C the clef of *ut*, E the clef of *mi*, &c. In proportion as the system was extended, the embarrassment and superfluity of this multitude of clefs were felt.

Gui d'Arezzo, who had invented them, marked a letter or clef at the beginning of each line in the stave; for as yet he had placed no notes in the spaces. In process of time they marked no more than one of the seven clefs at the beginning of one of the lines only; and this was sufficient to fix the position of all the rest, according to their natural order: at last, of these seven lines or clefs they selected four, which were called *claves signatæ*, or *discriminating clefs*, because they satisfied themselves with marking one of them upon one of the lines, from which the powers of all the others might be recognized. Presently afterwards they even retrenched one of these four, viz. the gamma, of which they made use to mark the *sol* below, that is to say, the hypoproslambanomena added to the system of the Greeks.

In reality Kircher asserts, that if we understood the characters in which ancient music was written, and examined minutely the forms of our clefs, we should find that each of them represents the letter a little altered in its form, by which the note was originally named. Thus the clef of *sol* was originally a G, the clef of *ut* a C, and the clef of *fa* an F.

We have then three clefs, one a fifth above the other: the clef of F, or *fa*, which is the lowest; the clef of *ut*, or C, which is the fifth above the former; and the clef of *sol*, or G, which is a fifth above that of *ut*. These clefs, both as marked by foreigners and in Britain, may be seen in art. 170 of *Music*; upon which it is necessary to remark, that by a remain of ancient practice, the clef is always placed upon a line, and never in a space. It deserves notice, that the clef of *fa* is marked in three different manners: one in music which is printed; another in music which is written or engraved; and a third in the full harmony of the chorus.

By adding four lines above the clef of *sol*, and three lines beneath the clef of *fa*, which gives both above and below the greatest extent of permanent or established lines, it appears, that the whole scale of notes which can be placed upon the gradations relative to these clefs amounts to 24; that is to say, three octaves and

Clef.

Plate CXLIV. fig. 2. Vol. V.

Clef.

and a fourth from the F, or *fa*, which is found beneath the first line, to the *fi*, or B, which is found above the last, and all this together forms what we call the *general claviary*; from whence we may judge, that this compass has, for a long time, constituted the extent of the system. But as at present it is continually acquiring new degrees, as well above as below, the degrees are marked by leger lines, which are added above or below as occasion requires.

Instead of joining all the lines, as has been done by Rousseau in his Dictionary, (plate A, fig. 5.) to mark the relation which one clef bears to another, they separate them five by five; because it is pretty nearly within the degrees to which the compass of ordinary voices extends. This collection of five lines is called a *stave*; and in these they place a clef, to determine the names of the notes, the positions of semitones, and to show what station the stave occupies in the claviary or general scale.

In whatever manner we take five successive lines in the claviary, we shall find one clef comprehended; nay, sometimes two, in which case one may be retrenched as useless. Custom has even prescribed which of the two should be retrenched, and which retained; it is this likewise which has determined the number of positions assigned to each clef.

If I form a stave of the first five lines in the claviary, beginning from below, I find the clef of *fa* in the fourth line. This then is one position of the clef, and this position evidently relates to the lowest note; thus likewise it is that of the bass clef.

If I wish to gain a third in ascent, I must add a line above; I must then obliterate one below, otherwise the stave will contain more than five lines. The clef of *fa* then is found transferred from the fourth to the third, and the clef of *ut* is likewise found upon the fifth; but as two clefs are useless, they retrench here that of *ut*. It is evident, that the stave of this clef is a third higher than the former.

By throwing away still one line below to gain another above, we have a third kind of a stave, where the clef of *fa* will be found upon the second line, and that of *ut* upon the fourth. Here we leave out the clef of *fa*, and retain that of *ut*. We have now gained another third above, and lost it below.

By continuing these alterations from line to line, we pass successively through four different positions of the clef of *ut*. Having arrived at that of *sol*, we find it placed upon the second line, and then upon the first. This position includes the five highest lines, and gives the sharpest diapason which the clefs can signify.

The reader may see in Rousseau's Musical Dictionary, Plate A. fig. 5. this succession of clefs from the lowest to the highest; which in all constitutes eight staves, clefs, or different positions of clefs.

Whatever may be the character and genius of any voice or instrument, if its extent above or below does not surpass that of the general claviary, in this number may be found a station and a clef suitable to it; and there are, in reality, clefs determined for all the parts in music. If the extent of a part is very considerable, so that the number of lines necessary to be added above or below may become inconvenient, the clef is then changed in the course of the music. It may be plainly

perceived by the figure, what clef it is necessary to choose, for raising or depressing any part, under whatever clef it may be actually placed.

It will likewise appear, that, in order to adjust one clef to another, both must be compared by the general claviary, by means of which we may determine what every note under one of the clefs is with respect to the other. It is by this exercise repeated that we acquire the habit of reading with ease all the parts.

From this manœuvre it follows, that we may place whatever note we please of the gamut upon any line or space whatever of the stave, since we have the choice of eight different positions, which is equal to the number of notes in the octave. Thus you may mark a whole tune upon the same line, by changing the clef at each gradation. The 7th fig. of the same plate in Rousseau's Musical Dictionary, to which we formerly referred, shows by the series of clefs the order of the notes, *re, fa, la, ut, mi, sol, fi, re*, rising by thirds, although all placed upon the same line. The fig. following represents upon the order of the same clefs the note *ut*, which appears to descend by thirds upon all the lines of the stave; and further, which yet, by means of changing the clef, still preserves its unison. It is upon such examples as this, that scholars ought to exercise themselves, in order to understand at the first glance the powers of all the clefs, and their simultaneous effect.

There are two of their positions, viz. the clef of *sol* upon the first line, and that of *fa* upon the third, which seem daily to fall more and more into desuetude. The first of these may seem less necessary, because it produces nothing but a position entirely similar to that of *fa* upon the fourth line, from which however it differs by two octaves. As to the clef of *fa*, it is plain, that in removing it entirely from the third line, we shall no longer have any equivalent position, and that the composition of the claviary, which is at present complete, will by these means become defective.

Thus much for Rousseau's account of clefs. He proceeds to explain their transposition; but as this would render the present article too long and intricate, we refer the curious to his *Musical Dictionary*, vol. i. page 162. See also *Malcom's Dissertation on Music*.

CLEFT, in a general sense, is a space made by the separation of parts. Green timber is very apt to split and cleave in several places, after it is wrought into form; and these cracks in it are very disagreeable to the sight. The common method of the country carpenters is to fill up these cracks with a mixture of grease and saw dust; but the neatest way of all is, the soaking both sides well with the fat of beef-broth, and then dipping pieces of sponge into the same broth, and filling up all the cracks with them: they swell out so as to fill the whole crack; and accommodate themselves so well to it, that the deficiency is hardly seen.

CLEFTS, or *Cracks*, in farriery, appear on the bought of the pasterns, and are caused by a sharp and malignant humour. See *FARRIERY Index*.

CLEMA, in antiquity, a twig of the vine, which serves as a badge of the centurion's office.

CLEMATIS, VIRGIN'S-BOWER. See *BOTANY Index*.

Clef
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Clematis.

Clemency. CLEMENCY, denotes much the same with mercy, and implies a remission of severity towards offenders. The term is most generally used in speaking of the forgiveness exercised by princes or persons of high authority. It is the result, indeed, of a disposition which ought to be cultivated by all ranks, though its effects cannot be equally conspicuous or extensive. In praise of clemency joined with power, it is observed, that it is not only the privilege, the honour, and the duty of a prince, but it is also his security, and better than all his garrisons, forts, and guards, to preserve himself and his dominions in safety: That that prince is truly royal, who masters himself; looks upon all injuries as below him; and governs by equity and reason, not by passion or caprice. In illustration of this subject, the following examples are selected out of many recorded in history.

Sueton. c. 9. 1. Two patricians having conspired against Titus the Roman emperor, were discovered, convicted, and sentenced to death by the senate; but the good-natured prince sent for them, and in private admonished them, that in vain they aspired to the empire, which was given by destiny; exhorting them to be satisfied with the rank in which by Providence they had been placed, and offering them any thing else which was in his power to grant. At the same time he dispatched a messenger to the mother of one of them, who was then at a great distance, and under deep concern about the fate of her son, to assure her, that her son was not only alive, but forgiven.

Zof. ii. 674. 2. Licinius having raised a numerous army, Zofimus says 130,000 men, endeavoured to wrest the government out of the hands of his brother-in-law Constantine the emperor. But his army being defeated, Licinius fled with what forces he could rally to Nicomedia, whither Constantine pursued him, and immediately invested the place; but on the second day of the siege, the emperor's sister intreating him, with a flood of tears, by the tenderness he had ever shown for her, to forgive her husband, and grant him at least his life, he was prevailed upon to comply with her request; and the next day, Licinius, finding no means of making his escape, presented himself before the conqueror, and throwing himself at his feet, yielded to him the purple and the other ensigns of sovereignty. Constantine received him in a very friendly manner, entertained him at his table, and afterwards sent him to Thessalonica, assuring him, that he should live unmolested so long as he raised no new disturbances.

3. The council of thirty, established at Athens by Lylander, committed the most execrable cruelties. Upon pretence of restraining the multitude within their duty, and to prevent seditions, they had caused guards to be assigned them, had armed 3000 of the citizens for that purpose, and at the same time disarmed all the rest. The whole city was in the utmost terror and dismay. Whoever opposed their injustice and violence fell a victim to their resentment. Riches were a crime that never failed of drawing a sentence upon their owners, always followed with death and the confiscation of estates; which the thirty tyrants divided amongst themselves. They put more people to death (says Xenophon) in eight months of a peace, than their enemies had done in a war of thirty years. All the citizens of any consideration in Athens, and

who retained a love of liberty, quitted a place reduced to so hard and shameful a slavery, and sought elsewhere an asylum and retreat where they might live in safety. At the head of these was Thrafsybulus, a person of extraordinary merit, who beheld with the most lively affliction the miseries of his country.

The Lacedemonians had the inhumanity to endeavour to deprive those unhappy fugitives of this last resource. They published an edict to prohibit the cities of Greece from giving them refuge, decreed that they should be delivered up to the thirty tyrants, and condemned all such as should contravene the execution of this edict to pay a fine of five talents. Only two cities rejected with disdain an ordinance, Megara and Thebes; the latter of which made a decree to punish all persons whatsoever that should see an Athenian attacked by his enemies without doing his utmost to assist him. Lysias, an orator of Syracuse who had been banished by the thirty, raised 500 soldiers at his own expence, and sent them to the aid of the common country of Eloquence. Thrafsybulus lost no time. After having taken Phyta, a small fort in Attica, he marched to the Piræus, of which he made himself master. The thirty flew thither with their troops, and a battle ensued. The tyrants were overthrown. Critias, the most savage of them all, was killed on the spot: and as the army was taking to flight, Thrafsybulus cried out, "Wherefore do you fly from me as from a victor, rather than assist me as the avenger of your liberty? We are not enemies, but fellow-citizens, nor have we declared war against the city, but against the thirty tyrants." He continued to remind them, that they had the same origin, country, laws, and religion: he exhorted them to compassionate their exiled brethren, to restore their country to them, and resume their own liberty. This discourse had the desired effect. The army, upon their return to Athens, expelled the thirty, and substituted ten persons to govern in their room, whose conduct proved no better than theirs; but King Pausanias, moved with compassion for the deplorable condition to which a city, once so flourishing, was reduced, had the generosity to favour the Athenians in secret, and at length obtained a peace for them. It was sealed with the blood of the tyrants, who having taken arms to reinstate themselves in the government, were all put to the sword, and left Athens in the full possession of its liberty. All the exiles were recalled. Thrafsybulus at that time proposed the celebrated amnesty, by which the citizens engaged upon oath, that all past transactions should be buried in oblivion. The government was re-established upon its ancient footing, the laws were restored to their pristine vigour, and magistrates elected with the usual form.

This (says Rollin) is one of the finest events in ancient history, worthy the Athenian clemency and benevolence, and has served as a model to succeeding ages in all good governments. Never had tyranny been more cruel and bloody than that which the Athenians had lately thrown off. Every house was in mourning, every family bewailed the loss of some relation: it had been a series of public robbery and rapine, in which license and impunity had authorized all manner of crimes. The people seemed to have a right to demand the blood of all accomplices in such notorious malversations,

Clemency. factions, and even the interest of the state to authorize such a claim, that by the exemplary severities such enormous crimes might be prevented for the future. But Thraſybulus riſing above theſe ſentiments, from the ſuperiority of his more extenſive genius, and the views of a more diſcerning and profound policy, foreſaw, that by giving into the puniſhment of the guilty, eternal ſeeds of diſcord and enmity would remain, to weaken the public by domeſtic diviſions, when it was neceſſary to unite againſt the common enemy, and alſo occaſion the loſs to the ſtate of a great number of citizens, who might render it important ſervices from the view of making amends for paſt miſbehaviour.

4. Such conduct, after great troubles in a ſtate, has always appeared to the ableſt politicians, the moſt certain and ready means to reſtore the public peace and tranquillity. Cicero, when Rome was divided into two factions upon the occaſion of Cæſar's death, who had been killed by the conſpirators, calling to mind this celebrated amneſty, propoſed, after the example of the Athenians, to bury all that had paſſed in eternal oblivion.

5. Cardinal Mazarine obſerved to Don Lewis de Haro, prime miniſter of Spain, that this gentle and humane conduct in France had prevented the troubles and revolts of that kingdom from having any fatal conſequences, and "that the king had not loſt a foot of land by them to that day; whereas "the inflexible ſeverity of the Spaniards was the occaſion that the ſubjects of that monarchy, whenever they threw off the maſk, never returned to their obedience but by the force of arms; which ſufficiently appears (ſays he) in the example of the Hollanders, who are in the peaceable poſſeſſion of many provinces, that not an age ago were the patrimony of the king of Spain."

Herod.
lib. ix.
c. 77, 78.

6. Leonidas the Lacedæmonian having, with 300 men only, diſputed the paſs of Thermopylæ againſt the whole army of Xerxes; and being killed in that engagement, Xerxes, by the advice of Mardonius one of his generals, cauſed his dead body to be hung upon a gallows, making thereby the intended diſhonour of his enemy his own immortal ſhame. But ſome time after, Xerxes being defeated, and Mardonius ſlain, one of the principal citizens of Ægina came and addreſſed himſelf to Pauſanias, deſiring him to avenge the indignity that Mardonius and Xerxes had ſhown to Leonidas, by treating Mardonius's body after the ſame manner. As a farther motive for doing ſo, he added, that by thus ſatisfying the manes of thoſe who were killed at Thermopylæ, he would be ſure to immortalize his own name throughout all Greece, and make his memory precious to the lateſt poſterity. "Carry thy baſe counſels elſewhere (replied Pauſanias); thou muſt have a very wrong notion of true glory to imagine, that the way for me to acquire it is to reſemble the barbarians. If the eſteem of the people of Ægina is not to be purchaſed but by ſuch a proceeding, I ſhall be content with preſerving that of the Lacedæmonians only, amongſt whom the baſe and ungenerous pleaſure of revenge is never put in competition with that of ſhowing clemency and moderation to their enemies, eſpecially after their death. As for the ſouls of my departed countrymen, they are ſufficiently avenged by the death of the many thouſand Perſians ſlain upon the ſpot in the laſt engagement."

CLEMENS ROMANUS, biſhop of Rome, where he is ſaid to have been born; and to have been fellow-labourer with St Peter and St Paul. We have nothing remaining of his works that is clearly genuine, excepting one epiſtle, written to quiet ſome diſturbances in the church of Corinth; which, next to holy writ, is eſteemed one of the moſt valuable remains of eccleſiaſtical antiquity.

CLEMENS Alexandrinus, ſo called to diſtinguiſh him from the former, was an eminent father of the church, who flouriſhed at the end of the ſecond and beginning of the third centuries. He was the ſcholar of Pantænus, and the inſtructor of Origen. The beſt edition of his works is that in 2 vols folio, published in 1715, by Archbiſhop Potter.

CLEMENT V. POPE, the firſt who made a public ſale of indulgences. He tranſplanted the holy ſee to Avignon in France; greatly contributed to the ſuppreſſion of the knights templars; and was author of a compilation of the decrees of the general councils of Vienne ſtyled *Clementines*. He died in 1314.

CLEMENT VII. Julius de Medicis, Pope, memorable for his reſuſing to divorce Catharine of Arragon from Henry VIII.; and for the bull he published upon the king's marriage with Anne Boleyn, which, according to the Romiſh authors, loſt him England. He died in 1534.

CLEMENT XIV. Francis Laurentius Ganganelli, Pope, was born at St Angelo in the duchy of Urbino, in October 1705; and choſen pope, though not yet a biſhop, in 1769: at which time the ſee of Rome was involved in a moſt diſagreeable and dangerous conteſt with the houſe of Bourbon. His reign was rendered troubleſome by the collision of parties on the affairs of the Jeſuits; and it is pretended that his latter days were embittered by the apprehenſions of poiſon. Though this report was probably apocryphal, it is ſaid that he often complained of the heavy burden which he was obliged to bear; and regretted, with great ſenſibility, the loſs of that tranquillity which he enjoyed in his retirement when only a ſimple Franciſcan. He was, however, fortunate in having an opportunity, by a ſingle act, to diſtinguiſh a ſhort administration of five years in ſuch a manner as will ever prevent its ſinking into obſcurity. His death was immediately attributed to poiſon, as if an old man of 70, loaded with infirmities and diſorders, could not quit the world without violence. His proceedings againſt the Jeſuits furniſhed a plauſible pretence for this charge, and the malevolence of their enemies embellished it with circumſtances. It even ſeems as if the miniſters of thoſe powers who had procured their diſſolution did not think it beneath them to countenance the report; as if falſehood was neceſſary to prevent the revival of a body which had already funk, in its full ſtrength, under the weight of real miſconduct. The charge was the more ridiculous, as the pontiff had undergone a long and painful illneſs, which originally proceeded from a ſuppreſſion of urine, to which he was ſubject; yet the report was propogated with the greateſt induſtry; and though the French and Spaniſh miniſters were preſent at the opening of his body, the moſt horrible circumſtances were publiſhed relative to that operation. It was confidently told that the head fell off from the body, and that the ſtench poiſoned and killed the

Clementine the operators. It availed but little that the operators showed themselves alive and in good health, and that the surgeons and physicians proved the falsehood of every part of the report. Clement XIV. appears to have been a man of a virtuous character, and possessed of considerable abilities. He died much regretted by his subjects.

CLEMENTINE, a term used among the Augustines, who apply it to a person who, after having been nine years a superior, ceases to be so, and becomes a private monk, under the command of a superior. The word has its rise hence that, Pope Clement, by a bull, prohibited any superior among the Augustines from continuing above nine years in his office.

CLEMENTINES, in the canon law, are the constitutions of Pope Clement V. and the canons of the council of Vienne.

CLENARD, *Nicholas*, a celebrated grammarian in the 16th century, was born at Dieft; and after having taught humanity at Louvain, travelled into France, Spain, Portugal, and Africa. He wrote in Latin, 1. Letters relating to his Travels, which are very curious and scarce. 2. A Greek Grammar, which has been revised and corrected by many grammarians; and other works. He died at Grenoble in 1542.

CLEOBIS and BIRON, two youths, sons of Cydippe the priestess of Juno at Argos. When oxen could not be procured to draw their mother's chariot to the temple of Juno, they put themselves under the yoke, and drew it 45 stadia to the temple, amidst the acclamations of the multitude, who congratulated the mother on account of the piety of her sons. Cydippe intreated the goddess to reward the piety of her sons with the best gift that could be granted to a mortal. They went to rest and awoke no more; and by this the goddess showed that death is the only true happy event that can happen to a man. The Argives raised them statues at Delphi.

CLEOBULUS, son of Evagoras, and one of the Grecian sages; he was valiant, a lover of learning, and an enemy to vice. Flourished about 560 years before Christ.

CLEOMBROTUS, a king of Sparta, son of Anaxandrides. He was deterred from building a wall across the isthmus of Corinth against the approach of the Persians, by an eclipse of the sun. He died in the 75th Olympiad, and was succeeded by Plistarchus, son of Leonidas, a minor.

CLEOMBROTUS II. son of Pausanias king of Sparta, after his brother Agefipolis I. He made war against the Bœotians, and lest he should be suspected of treacherous communications with Epaminondas, he gave that general battle at Leuctra, in a very disadvantageous place. He was killed in the engagement, and his army destroyed, in the year of Rome 382.

CLEOMBROTUS III. a son-in-law of Leonidas king of Sparta, who for a while usurped the kingdom after the expulsion of his father-in-law. When Leonidas was recalled, Cleombrotus was banished, and his wife Chelonis, who had accompanied her father, now accompanied her husband in his exile.

CLEOME, in *Botany*: A genus of the filiquosa order, belonging to the tetradynamia class of plants; and in the natural method ranking under the 25th order, *Putamineæ*. There are three nectariferous glan-

dules, one at each sinus of the calyx except the lowest; the petals all rising upwards; the filiqua unilocular and bivalved. There are 15 species, all of them, except two, natives of warm climates. They are herbaceous plants, rising from one to two feet high; and are adorned with flowers of various colours, as red, yellow, flesh-colour, &c. They are propagated by seeds, and require no other care than what is common to other exotics which are natives of warm countries.

CLEOMENES, king of Sparta, conquered the Argives, and freed Athens from the tyranny of the Pisistratidæ. By bribing the oracle he pronounced Demaratus, his colleague on the throne, illegitimate, because he refused to punish the people of Ægina, who had deserted the Greeks. He killed himself in a fit of madness.

CLEOMENES II. succeeded his brother Agefipolis II. He reigned 34 years in the greatest tranquillity, and was father to Acrotatus and Cleonymus. He was succeeded by Areus I. son of Acrotatus.

CLEOMENES III. succeeded his father Leonidas. He was of an enterprising spirit, and resolved to restore the ancient discipline of Lycurgus in its full force. He killed the Ephori, and removed by poison his royal colleague Eurydamides, and made his own brother Euclidas king, against the laws of the state, which forbade more than one of the same family to sit on the throne. He made war against the Achæans, and attempted to destroy the Achæan league. Aratus the general of the Achæans, who supposed himself inferior to his enemy, called Antigonus to his assistance; and Cleomenes, when he had fought the unfortunate battle of Sellasia, retired into Egypt to the court of Ptolemy Evergetes, where his wife and children had gone before him. Ptolemy received him with great cordiality; but his successor, weak and suspicious, soon expressed his jealousy of this noble stranger, and imprisoned him. Cleomenes killed himself, and his body was flayed and exposed on a cross, 140 Olymp.

CLEON, the name of several noted men of antiquity. 1. Of an Athenian, who, though originally a tanner, became general of the armies of the state by his intrigues and eloquence. He took Thron in Thrace, and was killed at Amphipolis in a battle with Brasidas the Spartan general, Olymp. 89th. 2. A general of Messenia, who disputed with Aristodemus for the sovereignty. 3. A statuary. 4. A poet who wrote a poem on the Argonauts. 5. An orator of Halicarnassus who composed an oration for Lyfander, in which he intimated the propriety of making the kingdom of Sparta elective. 6. A Magnesian who wrote some commentaries, in which he speaks of portentous events, &c.

CLEONÆ, in *Ancient Geography*, a town of Argolis, above Mycenæ, on the road which leads from Argos to Corinth; standing on an eminence, on every side occupied by houses. In the forest near this town was slain by Hercules the huge lion (Sil. Italicus, Seneca). *Cleonæus* the epithet. *Cleonæum Sidus*, the lion.—Another *Cleonæ* on Mount Athos in Chalcidice.

CLEOPATRA, the celebrated queen of Egypt, was daughter of Ptolemy Auletes. By her extraordinary beauty, she subdued the two renowned Roman generals Julius Cæsar and Mark Antony; the latter of whom, it is thought, lost the empire of Rome by his attachment

Clementine
||
Cleome.

Cleomenes
||
Cleopatra.

Cleopatra
Clepsydra.

attachment to her. At length, Mark Antony being subdued by Octavius Cæsar, she tried the force of her declining charms upon the conqueror, but in vain; upon which, expecting no mercy from him, she poisoned herself, 30 years before Christ. According to some authors, she was the restorer of the Alexandrian library, to which she added that of Pergamos; and it is said, that she studied philosophy to console her for the absence of Antony. With her death ended the family of the Ptolemies in Egypt, after it had reigned from the death of Alexander 294 years: for Egypt, after this, was reduced to a Roman province, in which dependence it remained till it was taken from them by the Saracens, A. D. 641.

CLEOPATRIS, in *Ancient Geography*, a town of Egypt, on the Arabian gulf. See ARSINOË. Now said to be *Suez*, situated at the bottom of the gulf of the Red sea. E. Long. 34. 30. N. Lat. 30. 0.

CLEOSTRATUS, a celebrated astronomer born in Tenedos, was, according to Pliny, the first who discovered the signs of the zodiac; others say, that he only discovered the signs Aries and Sagittarius. He also corrected the errors of the Grecian year about the 306th year before Christ.

CLEPSYDRA, an instrument or machine serving to measure time by the fall of a certain quantity of water.

The word comes from *κλεψύδρα*, *condo*, and *ὕδωρ*, *aqua*, "water;" though there have likewise been clepsydræ made with mercury.

The Egyptians, by this machine, measured the course of the sun. Tycho Brahe, in our days, made use of it to measure the motion of the stars, &c. and Dudley used the same contrivance in making all his maritime observations. The use of clepsydræ is very ancient; they were invented in Egypt under the Ptolemies, as were also sun-dials. Their use was chiefly in the winter; the sun-dials served in the summer. They had two great defects; the one, that the water ran out with a greater or less facility, as the air was more or less dense; the other, that the water ran more readily at the beginning than towards the conclusion. M. Amontons has invented a clepsydra free from both these inconveniences; and which has these three grand advantages, of serving the ordinary purpose of clocks, of serving in navigation for the discovery of the longitude, and of measuring the motion of the arteries.

Construction of a CLEPSYDRA. To divide any cylindrical vessel into parts to be emptied in each division of time; the time wherein the whole, and that wherein any part, is to be evacuated, being given.

Suppose, for example, a cylindrical vessel, whose charge of water flows out in 12 hours, were required to be divided into parts to be evacuated each hour. 1. As the part of time 1 is to the whole time 12; so is the same time 12 to a fourth proportional, 144. 2. Divide the altitude of the vessel into 144 equal parts: here the last will fall to the last hour; the three next above to the last part but one; the five next to the tenth hour, &c.; lastly, the 23 last to the first hour. For since the times increase in the series of the natural numbers 1, 2, 3, 4, 5, &c. and the altitudes, if the numeration be in retrograde order from the twelfth hour, increase in the series of the unequal numbers 1,

3, 5, 7, 9, &c. the altitude, computed from the twelfth hour, will be as the squares of the times 1, 4, 9, 16, 25, &c. therefore the square of the whole time 144 comprehends all the parts of the altitude of the vessel to be evacuated. But a third proportional to 1 and 12 is the square of 12, and consequently it is the number of equal parts into which the altitude is to be divided, to be distributed according to the series of the unequal numbers, through the equal intervals of hours. Since in lieu of parts of the same vessel, other less vessels equal thereto may be substituted, the altitude of a vessel emptied in a given space of time being given, the altitude of another vessel to be emptied in a given time may be found; viz. by making the altitudes as the squares of the time. For a further description, with a figure, see HYDROSTATICS.

CLERC, JOHN LE, a most celebrated writer and universal scholar, born at Geneva in 1657. After he had passed through the usual course of study at Geneva, and had lost his father in 1676, he went to France in 1678; but returning the year after, he was ordained with the general applause of all his examiners. In 1682, Le Clerc visited England with a view to learning the language. He preached several times in the French churches in London, and visited several bishops and men of learning; but the smoky air of the town not agreeing with his lungs, he returned to Holland within the year, where he at length settled. He preached before a synod held at Rotterdam by the remonstrants in 1684; and was admitted professor of philosophy, polite literature, and the Hebrew tongue, in their school at Amsterdam. The remainder of his life affords nothing but the history of his works, and of the controversies he was engaged in; but these would lead into too extensive a detail. He continued to read regular lectures; and because there was no single author full enough for his purpose, he drew up and published his *Logic*, *Ontology*, *Pneumatology*, and *Natural Philosophy*. He published *Ars Critica*; a Commentary on the Old Testament; a Compendium of Universal History; an Ecclesiastical History of the two first Centuries; a French Translation of the New Testament, &c. In 1686, he began, jointly with M. de la Crose, his *Bibliothèque Universelle et Historique*, in imitation of other literary journals; which was continued to the year 1693 inclusive, in 26 vols. In 1703, he began his *Bibliothèque Choisie*, and continued it to 1714, and then commenced another work on the same plan called *Bibliothèque Ancienne et Moderne*, which he continued to the year 1728; all of them justly deemed excellent stores of useful knowledge. In 1728, he was seized with a palsy and fever; and after spending the last six years of his life with little or no understanding, died in 1736.

CLERC, John le, called *Chevalier*, an eminent historical painter, was born at Nanci in 1587, but studied in Italy, where he resided for 20 years; and was a disciple of Carlo Venetiano, with whom he worked a long time, and whose style he so effectually studied and imitated, that several of the pictures which were finished by Le Clerc were taken for the work of Venetiano. He was most highly esteemed at Venice for his extraordinary merit; and as a token of public respect, he was made a knight of St Mark. His freedom of hand was remarkable; he had a light pencil; and

Clerc.

Clerc,
Clergy.

and in his colouring he resembled his master. He died in 1633.

CLERC, *Sebastian le*, engraver, and designer in ordinary to the French king, was born at Metz in 1637. After having learnt designing, he applied himself to mathematics, and was engineer to the marshal de la Ferté. He went to Paris in 1665, where he applied himself to designing and engraving with such success, that M. Colbert gave him a pension of 600 crowns. In 1672 he was admitted into the royal academy of painting and sculpture; and in 1680 was made professor of geometry and perspective in the same academy. He published, besides a great number of designs and prints, 1. A Treatise on theoretical and practical Geometry. 2. A Treatise on Architecture; and other works: and died in 1714.—He was an excellent artist, but chiefly in the petit style. His genius seldom exceeds the dimensions of six inches. Within those limits he could draw up 20,000 men with great dexterity. No artist except Callot and Della Bella could touch a small figure with so much spirit. His most esteemed prints are: 1. The *passion of our Saviour*, on 36 small plates, lengthwise, from his own compositions. The best impressions are without the borders. 2. The *miracle of the feeding five thousand*, a middling-sized plate, lengthwise. In the first impressions, which are very rare, a town appears in the back-ground; in place of which a mountain is substituted in the common ones. 3. The *elevation of the large stones used in building the front of the Louvre*, a large plate, lengthwise. The first impressions are without the date 1677, which was afterwards added. 4. The *academy of the sciences*, a middling-sized plate, lengthwise. The first impressions are before the skeleton of the stag and tortoise were added. The second impressions are before the shadow was enlarged at the bottom, towards the right-hand side of the print. Both these impressions are very scarce. The first is rarely met with. This print was copied for Chambers's Dictionary. 5. The *May of the Gobelins*, a middle-sized plate, lengthwise. The first impression is before the woman was introduced, who covers the wheel of the coach. 6. The *four conquests*, large plates, lengthwise, representing the taking of Tournay, the taking of Douay, the defeat of the comte de Marsin, and the Switzerland alliance. 7. The *battles of Alexander*, from Le Brun, six small long plates, including the title, which represents the picture gallery at the Gobelins. The first impressions of the tent of Darius, which plate makes part of this set, is distinguished by the shoulder of the woman, who is seated in the front, being without the shadow, which was afterwards added; for which reason they are called the *prints with the naked shoulder*. 8. The *entry of Alexander into Babylon*, a middling-sized plate, lengthwise. In the first impressions, the face of Alexander is seen in profile; in the second, it is a three quarter face, and therefore called the *print with the head turned*.

CLERC, *George le*. See BUFFON.

CLERGY, a general name given to the body of ecclesiastics of the Christian church, in contradistinction to the laity. See LAITY.

The distinction of Christians into clergy and laity was derived from the Jewish church, and adopted into the Christian by the apostles themselves: whenever

any number of converts was made, as soon as they were capable of being formed into a congregation or church, a bishop or presbyter, with a deacon, were ordained to minister to them. Of the bishops, priests, and deacons, the clergy originally consisted; but in the third century, many inferior orders were appointed, as subservient to the office of deacon, such as ACOLUTHISTS, READERS, &c.

This venerable body of men being separated and set apart from the rest of the people, in order to attend the more closely to the service of Almighty God, have therefore large privileges allowed them by our municipal laws; and had formerly much greater, which were abridged at the time of the reformation, on account of the ill use which the Popish clergy had endeavoured to make of them. For, the laws having exempted them from almost every personal duty, they attempted a total exemption from every secular tie. But it is observed by Sir Edward Coke, that as the overflowing of waters doth many times make the river to lose its proper channel, so, in times past, ecclesiastical persons, seeking to extend their liberties beyond their due bounds, either lost, or enjoyed not, those which of right belonged to them. The personal exemptions do indeed for the most part continue: a clergyman cannot be compelled to serve on a jury, nor to appear at a court leet, or view of frank-pledge, which almost every other person is obliged to do; but if a layman is summoned on a jury, and before the trial takes orders, he shall notwithstanding appear and be sworn. Neither can he be chosen to any temporal office, as bailiff, reeve, constable, or the like; in regard of his own continual attendance on the sacred function. During his attendance on divine service, he is privileged from arrests in civil suits. In cases also of felony, a clerk in orders shall have the benefit of his clergy, without being branded in the hand; and may likewise have it more than once; in both which particulars he is distinguished from a layman. But, as they have their privileges, so they have also their disabilities, on account of their spiritual avocations. Clergymen are incapable of sitting in the house of commons; and by statute 21 Hen. VIII. c. 13. are not in general allowed to take any lands or tenements to farm, upon pain of 10l. per month, and total avoidance of the lease; nor, upon like pain, to keep any tap-house or brew-house; nor engage in any manner of trade, nor sell any merchandise, under forfeiture of treble value. Which prohibition is consonant to the canon law.

Benefit of CLERGY, is an ancient privilege whereby one in orders claimed to be delivered to his ordinary to purge himself of felony.

After trial and conviction * of a criminal, the judgment of the court regularly follows, unless suspended or arrested by some intervening circumstance, of which the principal is *benefit of clergy*; a title of no small curiosity as well as use; and concerning which, therefore, it may not be improper to inquire, 1. Into its original, and the various mutations which this privilege of the clergy has sustained. 2. To what persons it is to be allowed at this day. 3. In what cases. 4. The consequences of allowing it.

I. Clergy, the *privilegium clericale*, or (in common speech) the benefit of clergy, had its original from the

Clergy.

Blackst.
Comment.

* See the articles *Arrestment, Plea, Trial, and Conviction*.

Blackst.
Comment.
pious

erger. pious regard paid by Christian princes to the church in its infant state, and the ill use which the popish ecclesiastics soon made of that pious regard. The exemptions which they granted to the church were principally of two kinds: 1. Exemptions of places consecrated to religious duties from criminal arrests; which was the foundation of sanctuaries. 2. Exemption of the persons of clergymen from criminal process before the secular judge in a few particular cases; which was the true original and meaning of the *privilegium clericale*.

But the clergy increasing in wealth, power, honour, number, and interest, soon began to set up for themselves; and that which they obtained by the favour of the civil government, they now claimed as their inherent right, and as a right of the highest nature, indefeasible, and *jure divino*. By their canons, therefore, and constitutions, they endeavoured at, and where they met with easy princes, obtained, a vast extension of those exemptions; as well in regard to the crimes themselves, of which the list became quite universal, as in regard to the persons exempted; among whom were at length comprehended, not only every little subordinate officer belonging to the church or clergy, but even many that were totally laymen.

In England, however, although the usurpations of the pope were very many and grievous, till Henry VIII. totally exterminated his supremacy, yet a total exemption of the clergy from secular jurisdiction could never be thoroughly effected, though often endeavoured by the clergy; and therefore, though the ancient *privilegium clericale* was in some capital cases, yet it was not universally allowed. And in those particular cases, the use was for the bishop or ordinary to demand his clerks to be remitted out of the king's courts as soon as they were indicted; concerning the allowance of which demand there was for many years a great uncertainty; till at length it was finally settled in the reign of Henry VI. that the prisoner should first be arraigned; and might either then claim his benefit of clergy by way of declinatory plea; or, after conviction, by way of arrest of judgment. This latter way is most usually practised, as it is more to the satisfaction of the court to have the crime previously ascertained by confession or the verdict of a jury; and also it is more advantageous to the prisoner himself, who may possibly be acquitted, and so need not the benefit of his clergy at all.

Originally the law was held that no man should be admitted to the benefit of clergy, but such as had the *habitus et tonsuram clericalem*. But, in process of time, a much wider and more comprehensive criterion was established; every one that could read (a great mark of learning in those days of ignorance and her sister superstition) being accounted a clerk, or *clericus*, and allowed the benefit of clerkship, though neither initiated in clerkship, nor trimmed with the holy tonsure. But when learning, by means of the invention of printing, and other concurrent causes, began to be more generally diffused than formerly, and reading was no longer a competent proof of clerkship, or being in holy orders; it was found that as many laymen as divines were admitted to the *privilegium clericale*; and therefore by statute 4 Henry VII. c. 13.

a distinction was once more drawn between mere lay scholars and clerks that were really in orders. And, though it was thought reasonable still to mitigate the severity of the law with regard to the former, yet they were not put upon the same footing with actual clergy; being subjected to a slight degree of punishment, and not allowed to claim the clerical privilege more than once. Accordingly the statute directs, that no person, once admitted to the benefit of clergy, shall be admitted thereto a second time, until he produces his orders; and in order to distinguish their persons, all laymen who are allowed this privilege, shall be burned with a hot-iron in the brawn of the left thumb. This distinction between learned laymen and real clerks in orders was abolished for a time by the statutes 28 Hen. VIII. c. 1. and 32 Hen. VIII. c. 3.; but is held to have been virtually restored by statute 1 Edw. VI. c. 12. which statute also enacts, that lords of parliament and peers of the realm may have the benefit of their peerage, equivalent to that of clergy, for the first offence (although they cannot read, and without being burnt in the hand), for all offences then clergyable to commoners, and also for the crimes of house-breaking, highway-robbery, horse-stealing, and robbing of churches.

After this burning, the laity, and before it the real clergy, were discharged from the sentence of the law in the king's courts, and delivered over to the ordinary, to be dealt with according to the ecclesiastical canons. Whereupon the ordinary, not satisfied with the proofs adduced in the profane secular court, set himself formally to make a purgation of the offender by a new canonical trial; although he had been previously convicted by his country, or perhaps by his own confession. This trial was held before the bishop in person, or his deputy; and by a jury of twelve clerks: And there, first, the party himself was required to make oath of his own innocence; next, there was to be the oath of twelve compurgators, who swore they believed he spoke the truth; then, witnesses were to be examined upon oath, but on behalf of the prisoner only; and, lastly, the jury were to bring in their verdict upon oath, which usually acquitted the prisoner; otherwise, if a clerk, he was degraded, or put to penance. A learned judge in the beginning of last century, remarks with much indignation the vast complication of perjury and subornation of perjury in this solemn farce of a mock trial; the witnesses, the compurgators, and the jury, being all of them partakers in the guilt: the delinquent party also, though convicted in the clearest manner, and conscious of his own offence, yet was permitted, and almost compelled, to swear himself not guilty; nor was the good bishop himself, under whose countenance this scene was transacted, by any means exempt from a share of it. And yet, by this purgation, the party was restored to his credit, his liberty, his lands, and his capacity of purchasing afresh, and was entirely made a new and an innocent man.

This scandalous prostitution of oaths, and the forms of justice, in the almost constant acquittal of felonious clerks by purgation, was the occasion that, upon very heinous and notorious circumstances of guilt, temporal courts would not trust the ordinary with the trial of the offender, but delivered over to him the

Clergy. convicted clerk, *absque purgatione faciendo*; in which situation the clerk convict could not make purgation; but was to continue in prison during life, and was incapable of acquiring any personal property, or receiving the profits of his lands, unless the king should please to pardon him. Both these courses were in some degree exceptionable; the latter perhaps being too rigid, as the former was productive of the most abandoned perjury. As therefore these mock trials took their rise from factious and popish tenets, tending to exempt one part of the nation from the general municipal law, it became high time, when the reformation was thoroughly established, to abolish so vain and impious a ceremony.

Accordingly the statute 18 Eliz. c. 7. enacts, that, for the avoiding such perjuries and abuses, after the offender has been allowed his clergy, he shall not be delivered to the ordinary as formerly; but, upon such allowance, and burning of the hand, he shall forthwith be enlarged and delivered out of prison, with proviso, that the judge may, if he thinks fit, continue the offender in goal for any time not exceeding a year. And thus the law continued unaltered for above a century; except only, that the statute 21 Jac. I. c. 6. allowed, that women convicted of simple larcenies under the value of 10s. should (not properly have the benefit of clergy, for they were not called upon to read; but) be burned in the hand, whipped, or stock-ed, or imprisoned for any time not exceeding a year. And a similar indulgence by the statutes 3 and 4 Will. and Mary, c. 9. and 4 and 5 Will. and Mary, c. 24. was extended to women guilty of any clergyable felony whatever; who were allowed once to claim the benefit of the statute, in like manner as men might claim the benefit of clergy, and to be discharged upon being burned in the hand, and imprisoned for any time not exceeding a year. All women, all peers, and all male commoners who could read, were therefore discharged in such felonies absolutely, if clerks in orders; and for the first offence upon burning in the hand, if lay; yet all liable (except peers), if the judge saw occasion, to imprisonment not exceeding a year. And these men who could not read, if under the degree of peerage, were hanged.

Afterwards, indeed, it was considered, that education and learning were no extenuations of guilt, but quite the reverse; and that if the punishment of death for simple felony was too severe for those who had been liberally instructed, it was, *à fortiori*, too severe for the ignorant also. And thereupon, by statute 5 Anne, c. 6. it was enacted that the benefit of clergy should be granted to all those who were entitled to ask it without requiring them to read by way of conditional merit. And, experience having shown that so universal a lenity was frequently inconvenient, and an encouragement to commit the lower degrees of felony; and that though capital punishments were too rigorous for these inferior offences, yet no punishment at all (or next to none, as branding or whipping), was as much too gentle; it was enacted by the same statute 5 Anne, c. 6. that when any person is convicted of any theft or larceny, and burnt in the hand for the same, he shall, at the discretion of the judge, be committed to the house of correction or public work-house, to be there kept to hard labour for any

time not less than six months, and not exceeding two years; with a power of inflicting a double confinement in case of the party's escape from the first. And it is also enacted by the statutes 4 Geo. I. c. 11. and 6 Geo. I. c. 23. that when any persons shall be convicted of any larceny, either grand or petit, or any felonious stealing or taking of money or goods and chattels, either from the person or the house of any other, or in any other manner, and who by the law shall be entitled to the benefit of clergy, and liable only to the penalties of burning in the hand, or whipping; the court in their discretion, instead of such burning in the hand, or whipping, may direct such offenders to be transported to America for seven years; and if they return, or are seen at large in this kingdom within that time, it shall be felony without benefit of clergy.

In this state does the benefit of clergy at present stand; very considerably different from its original institution; the wisdom of the English legislature having, in the course of a long and laborious process, extracted, by a noble alchemy, rich medicines out of poisonous ingredients; and converted, by gradual mutations, what was at first an unreasonable exemption of particular popish ecclesiastics, into a merciful mitigation of the general law with respect to capital punishments.

From the whole of this detail, we may collect, that however in times of ignorance and superstition, that monster in true policy may for a while subsist, of a body of men residing in a state, and yet independent of its laws; yet when learning and rational religion have a little enlightened men's minds, society can no longer endure an absurdity so gross, as must destroy its very fundamentals. For, by the original contract of government, the price of protection by the united force of individuals, is that of obedience to the united will of the community. This united will is declared in the laws of the land; and that united force is exerted in their due, and universal, execution.

II. We are next to inquire, to what persons the benefit of clergy is to be allowed at this day; and this must chiefly be collected from what has been observed in the preceding article. For, upon the whole, we may pronounce, that all clerks in order are, without any branding, and of course without any transportation (for that is only substituted in lieu of the other), to be admitted to this privilege, and immediately discharged, or at most only confined for one year; and this as often as they offend. Again, all lords of parliament, and peers of the realm, by the statute 1 Edw. VI. c. 12. shall be discharged in all clergyable and other felonies provided for by the act without any burning in the hand, in the same manner as real clerks convict; but this is only for the first offence. Lastly, all the commons of the realm, not in orders, whether male or female, shall, for the first offence, be discharged of the punishment of felonies, within the benefit of clergy, upon being burnt in the hand, and suffering discretionary imprisonment; or, in case of larceny, upon being transported for seven years, if the court shall think proper.

III. The third point to be considered is, for what crimes the *privilegium clericale*, or benefit of clergy, is to be allowed. And it is to be observed, that neither

ther in high treason, nor in petit larceny, nor in any mere misdemeanors, it was indulged at the common law; and therefore we may lay it down as a rule, that it was allowable only in petit treason and capital felonies; which for the most part became legally entitled to this indulgence by the statute *de clero*, 25 Edw. III. stat. 3. c. 4. which provides, that clerks convicted for treason or felonies, touching other persons than the king himself or his royal majesty, shall have the privilege of holy church. But yet it was not allowed in all cases whatsoever: for in some it was denied even in common law, viz. *infidatio viarum*, or lying in wait for one on the highway; *depopulatio agrorum*, or destroying and ravaging a country; *combustio domorum*, or arson, that is, burning of houses; all which are a kind of hostile acts, and in some degree border upon treason. And farther, all these identical crimes, together with petit treason, and very many other acts of felony, are ousted of clergy by particular acts of parliament.

Upon the whole, we may observe the following rules. 1. That in all felonies, whether new created, or by common law, clergy is now allowable, unless taken away by act of parliament. 2. That where clergy is taken away from the principal, it is not of course taken away from the accessory, unless he be also particularly included in the words of the statute. 3. That when the benefit of clergy is taken away from the offence (as in case of murder, buggery, robbery, rape, and burglary), a principal in the second degree, being present, aiding and abetting the crime, is as well excluded from his clergy as he that is a principal in the first degree: but, 4. That where it is only taken away from the person committing the offence (as in the case of stabbing, or committing larceny in a dwelling-house), his aiders and abettors are not excluded, through the tenderness of the law, which hath determined that such statutes shall not be taken literally.

IV. Lastly, We are to inquire what the consequences are to the party, of allowing him this benefit of clergy. We speak not of the branding, imprisonment, or transportation; which are rather concomitant conditions, than consequences, of receiving this indulgence. The consequences are such as affect his present interest, and future credit and capacity; as having been once a felon, but now purged from that guilt by the privilege of clergy; which operates as a kind of statute pardon. And we may observe, 1. That, by his conviction, he forfeits all his goods to the king; which, being once vested in the crown, shall not afterwards be restored to the offender. 2. That, after conviction, and till he receives the judgment of the law by branding or the like, or else is pardoned by the king, he is, to all intents and purposes, a felon; and subject to all the disabilities and other incidents of a felon. 3. That, after burning or pardon, he is discharged for ever of that, and all other felonies before committed, within the benefit of clergy; but not of felonies from which such benefit is excluded; and this by statutes 8 Eliz. c. 4. and 18 Eliz. c. 7. 4. That, by the burning, or pardon of it, he is restored to all capacities and credits, and the possession of his lands, as if he had never been convicted. 5. That what is said with regard to the advantages of commoners and

laymen, subsequent to the burning in the hand, is equally applicable to all peers and clergymen, although never branded at all. For they have the same privileges, without any burning, to which others are entitled after it.

CLERK (*clericus*), a word formerly used to signify a learned man, or man of letters. The word comes from the Greek *κληρος*, used for *clergy*; but more properly signifying *lot* or *heritage*, in regard the lot and portion of clerks or ecclesiastics is to serve God. Accordingly *clerus* was at first used to signify those who had a particular attachment to the service of God. The origin of the expression is derived from the Old Testament, where the tribe of Levi is called the *lot*, *heritage*, *κληρος*; and God is reciprocally called *their portion*; by reason that tribe was consecrated to the service of God, and lived on the offerings made to God, without any other settled provision as the rest had. Thus, Pasquier observes, the officers of the counts (*comites*) were anciently created under the title of *clerks of accounts*; and secretaries of state were called *clerks of the secret*. So *clericus domini regis*, in the time of Edward I. was Englished, *the king's secretary*, or *clerk of his council*. The term was applied indifferently to all who made any profession of learning; or who knew how to manage the pen; though originally it was appropriated to ecclesiastics. As the nobility and gentry were usually brought up to the exercise of arms, there were none but the clergy left to cultivate the sciences: hence, as it was the clergy alone who had made any profession of letters, a very learned man came to be called a *great clerk*, and a stupid ignorant man a *bad clerk*.

CLERK is also applied to such as by their course of life exercise their pens in any court or office; of which there are various kinds: thus,

CLERK of the Bails, an officer in the court of king's bench, whose business is to file all bail-pieces taken in that court, where he always attends.

CLERK of the Check, an officer belonging to the king's court; so called, because he has the check and controulment of the yeomen that belong to the king, queen, or prince. He likewise, by himself or deputy, sets the watch in the court. There is also an officer in the navy of the same name, belonging to the king's yards.

CLERK of the Crown, an officer in the king's bench, who frames, reads, and records all indictments against offenders, there arraigned or indicted of any public crime. He is likewise termed *clerk of the crown-office*, in which capacity he exhibits information by order of the court for divers offences.

CLERK of the Crown, in chancery, an officer whose business it is constantly to attend the lord chancellor in person or by deputy; to write and prepare for the great seal special matters of state by commission, both ordinary and extraordinary, viz. commissions of lieutenancy, of justices of assize, oyer and terminer, gaol-delivery, and of the peace; all general pardons, granted either at the king's coronation, or in parliament; the writs of parliament, with the names of the knights, citizens, and burghesses, are also returned into his office. He also makes out special pardons and writs of execution on bonds of statute-staple forfeited.

CLERK of the Deliveries of the Ordnance. See ORD-NANCE.

Clerk.

CLERK of the Errors, in the court of common pleas, an officer who transcribes and certifies into the king's bench the tenor of the record of the action on which the writ of error, made out by the curfitor, is brought there to be determined. In the king's bench, the clerk of the errors transcribes and certifies the records of causes, by bill, in that court, into the exchequer. And the business of the clerk of the errors in the exchequer, is to transcribe the records certified thither out of the king's bench, and to prepare them for judgment in the exchequer-chamber.

CLERK of the Effoins, in the court of common pleas, keeps the effoin roll, or enters effoins: he also provides parchment, cuts it into rolls, marks the numbers on them, delivers out all the rolls to every officer, and receives them again when written. See ESSOIN.

CLERK of the Estreats, an officer in the exchequer, who every term receives the estreats out of the lord-treasurer's remembrancer's office, and writes them out to be levied for the crown.

CLERK of the Green-cloth, formerly an officer in chancery, but now abolished.

CLERK of the Hamper, or *Hanaper*, an officer in chancery, whose business is to receive all money due to the king for the seals of charters, letters patent, commissions, and writs; also the fees due to the officers for enrolling and examining them.

CLERK-Comptroller of the King's Household, an officer of the king's court, authorized to allow or disallow the charges of pursuivants, messengers of the green-cloth, &c. to inspect and controul all defects of any of the inferior officers; and to sit in the counting-house with the lord-steward and other officers of the household for regulating such matters.

CLERK of the King's Silver, an officer of the common pleas, to whom every fine is brought, after it has passed the office of the *custos brevium*; and who enters the effect of writs of covenant, into a book kept for that purpose, according to which all the fines of that term are recorded in the rolls of the court.

CLERK of the Market, an officer of the king's house, to whom is given the charge of the king's measures and weights, the standards of those that ought to be used all over England.

CLERK of the Nichils, or *Nibils*, an officer of the exchequer, who makes a roll of all such sums as are nichilled by the sheriffs upon their estreats of green wax, and delivers them into the remembrancer of the treasury, to have execution done upon them for the king. See NIHIL.

CLERK of the Ordnance. See ORDNANCE.

CLERK of the Outlawries, an officer of the common pleas, and deputy to the attorney-general, for making out all writs of *capias utlegatum* after outlawry, to which there must be the king's attorney's name.

CLERK of the Paper-office, an officer belonging to the king's bench, whose business is to make up the paper-books of special pleadings in that court.

CLERK of the Peace, an officer belonging to the sessions of the peace, whose business is to read indictments, inrol the proceedings, and draw the process: he likewise certifies into the king's bench transcripts of indictments, outlawries, attainders, and convictions had before the justices of peace, within the time limited by statute, under a certain penalty. This office is in the

gift of the *custos rotulorum*, and may be executed by deputy.

CLERK of the Pells, an officer that belongs to the exchequer, whose business is to enter every teller's bill into a parchment-roll called *pellis receptorum*; and to make another roll of payments called *pellis exituum*.

CLERK of the Petty Bag, an officer of the court of chancery, whereof there are three, the master of the rolls being the chief: their business is to record the return of all inquisitions out of every shire; to make out patents of customers, gaugers, comptrollers, &c.; liberates upon extent of statutes-staple; *conge d'elires* for bishops; summons of the nobility, clergy, and burgesses to parliament; and commissions directed to knights and others of every shire, for assessing subsidies and taxes.

CLERK of the Pipe, an officer of the exchequer, who having the accounts of all debts due to the king, delivered out of the remembrancer's office, charges them in a great roll folded up like a pipe. He writes out warrants to sheriffs, to levy the said debts on the goods and chattels of the debtors; and if they have no goods, then he draws them down to the treasurer's remembrancer to write estreats against their lands.

CLERK of the Pleas, an officer of the exchequer, in whose office all the officers of the court, having special privilege, ought to sue or to be sued in any action. In this office also actions at law may be prosecuted by other persons, but the plaintiff ought to be tenant or debtor to the king, or some way accountable to him. The under clerks are attorneys in all suits.

CLERKS of the Privy-seal, four officers that attend the lord privy seal, for writing and making out all things that are sent by warrant from the signet to the privy seal, and to be passed the great seal; and likewise to make out privy seals, upon special occasions of his majesty's affairs, as for loan of money or the like.

CLERK of the Rolls, an officer of the chancery, whose business is to make searches after, and copies of deeds, officers, &c.

CLERK of the Signet, an officer continually attending upon his majesty's principal secretary, who has the custody of the privy signet, as well for sealing the king's private letters as those grants which pass the king's hand by bill signed. There are four of these officers who have their diet at the secretary's table.

SIX CLERKS, officers in chancery next in degree below the twelve masters, whose business is to inrol commissions, pardons, patents, warrants, &c. which pass the great seal. They were anciently *clerici*, and forfeited their places if they married. These are also attorneys for parties in suits depending in the court of chancery.

CLERK of the Treasury, an officer belonging to the court of common pleas, who has the charge of keeping the records of the court, makes out all records of *nisi prius*, and likewise all exemplifications of records being in the treasury. He has the fees due for all searches; and has under him an under keeper, who always keeps one key of the treasury-door.

CLERK of the Warrants, an officer of the common pleas, whose business is to enter all warrants of attorney for plaintiffs and defendants in suit; and to inrol deeds of bargain and sale, that are acknowledged in court, or before a judge. His office is likewise to

estreat.

Clerk.

Clerke
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Clermont
Manu-
script.

estreat into the exchequer all issues, fines, estreats, and amercements, which grow due to the crown in that court.

CLERKE, CAPTAIN CHARLES, a celebrated English navigator, was bred up in the navy from his youth, and was present in several actions during the war of 1755. In that between the Bellona and Courageaux he was in great danger; for having been stationed in the mizen-top on board the former, the mast was carried overboard by a shot, and he fell into the sea along with it; but, however, was taken up without having received any injury. When Commodore Byron made his first voyage round the world, Mr Clerke served on board his ship in quality of a midshipman; and was afterwards on the American station. In the year 1768, he sailed round the world a second time in the Endeavour, on board of which he served in the station of master's mate; but, during the voyage, succeeded to a lieutenantancy. He returned in 1775, and was soon after appointed master and commander. When Captain Cook undertook his last voyage, Mr Clerke was appointed captain of the Discovery; and in consequence of the death of Captain Cook, naturally succeeded to the supreme command. He did not, however, long enjoy his new dignity. Before his departure from England, he had manifest symptoms of a consumption. Of this disease he lingered during the whole of the voyage; and his long residence in the cold northern climates cut off all hopes of recovery; but though sensible that the only chance he had of prolonging his life was by a speedy return to a warmer climate, his attention to his duty was so great, that he persevered in search of a passage between the Asiatic and American continents until every one of the officers was of opinion that it was impracticable. He bore his distemper with great firmness and equanimity, retaining a good flow of spirits to the last; and died on the 22d of August 1778, in the 38th year of his age, the ship being then within view of the coast of Kamtschatka.

CLERKE'S *Island* lies on the western side of the American continent, in N. Lat. 63. 15. and E. Long. 169. 30. It was discovered by Captain Cook in his last voyage, but a landing could not be effected. At a distance it appeared to be of considerable extent, and to have several hills connected with the low grounds in such a manner as to make it look like a group of islands. Near its eastern extremity is a little island remarkable for having three elevated rocks upon it. Both the large and small island are uninhabited.

CLERMONT, a considerable, rich, and populous town of France, in Auvergne, with a bishop's see. The cathedral, the public squares, and the walks, are very fine. Here is a bridge naturally formed, as they pretend, by the petrifying quality of a fountain. E. Long. 3. 10. N. Lat. 45. 47.

CLERMONT *Manuscript*, is a copy of St Paul's Epistles, found in the monastery of Clermont in France, and used by Beza, together with the Cambridge MS. in preparing his edition of the New Testament. This copy is in the octavo form, and is written on fine vellum in Greek and Latin, with some mutilations. Beza supposes that it is of equal antiquity with the Cambridge copy; but both were probably written by a Latin scribe in a later period than he assigns to them.

The various readings of this MS. were communicated to Archbishop Usher, and they are preserved by Walton. The MS. itself was in the possession of Morinus; and after his death deposited among the MS. copies of the Royal Library at Paris, N^o 2245. Cleromancy
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Cleves.

CLEROMANCY, a kind of divination performed by the throwing of dice, or little bones; and observing the points, or marks, turned up. The word comes from κληρος, "lot," and μαντια, "divination." At Bura, a city of Achaia, was a temple and celebrated oracle of Hercules, where such as consulted the oracle, after praying to the idol, threw four dice, the points whereof being well scanned by the priest, he was supposed to draw an answer from them.

Something of this kind seems to have been practised with regard to Jonah.

CLERVAL, a town of France, in the Franche Comté, seated on the river Doux, belonging to the house of Wirtemburgh, but depends on the crown of France. E. Long. 5. 57. N. Lat. 46. 35.

CLERVAUX, one of the most celebrated and finest abbeys of France, in Champagne, five miles from Bar-sur-Aube, and seated in a valley surrounded with woods and mountains. It is the chief of the Cistercian order. Here is the famous Tun of St Bernard, which will hold 800 tuns of wine. Near this abbey is a small town.

CLESIDES, a Greek painter, about 276 years before Christ, in the reign of Antiochus I. He revenged the injuries he had received from Queen Stratonice, by representing her in the arms of a fisherman. However indecent the painter might represent the queen, she was drawn with such personal beauty, that she preserved the piece and liberally rewarded the artist.

CLETHRA. See BOTANY *Index*.

CLEVELAND, a district in the north riding of Yorkshire in England, from whence the noble family of Fitzroy took the title of duke, but which is now extinct.

CLEVELAND, *John*, an English poet of some eminence in his time, who during the civil war under Charles I. engaged as a literary champion in the royal cause against the parliamentarians. He died in 1658, and was much extolled by his party. His works, which consist of poems, characters, orations, epistles, &c. were printed in octavo in 1677.

CLEVES, the duchy of, a province of the circle of Westphalia, in Germany. It is divided into two parts by the Rhine, and is about 40 miles in length from east to west, and 20 in breadth from north to south. It is a fine agreeable country, and pretty populous. The towns are, Cleves the capital, Calcar, Gennet, Santen, Orfoy, Bureck, and Greit. These lie on the left side of the river. On the right, Daysburgh, Wese, Rees, and Emmerick. There have been great contests about this duchy, but it now belongs to the king of Prussia.

CLEVES, a city of Germany, in the duchy of Cleves, of which it is the capital. It stands upon a pleasant hill, about a mile from the Rhine, with which it communicates, by means of a canal which is large enough for great barges. The castle stands upon a mountain, and, though old, is very agreeable. It was built in the time of Julius Cæsar. It was taken by the

French

Client
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Climax.

French in 1794. Calvinists, Lutherans, and Roman Catholics, are all tolerated in this city. E. Long. 5. 50. N. Lat. 51. 45.

CLIENT, among the Romans, a citizen who put himself under the protection of some great man, who in respect of that relation was called *patron*.

This patron assisted his client with his protection, interest, and goods; and the client gave his vote for his patron, when he fought any office for himself or his friends. Clients owed respect to their patrons, as these owed them their protection.

The right of patronage was appointed by Romulus, to unite the rich and poor together, in such a manner as that one might live without contempt and the other without envy; but the condition of a client, in course of time, became little else than a moderate slavery.

CLIENT is now used for a party in a law-suit, who has turned over his cause into the hands of a counsellor or solicitor.

CLIFFORTIA. See BOTANY Index.

CLIMACTERIC, among physicians, (from *climacter*, "a ladder"), a critical year in a person's life.

According to some, this is every seventh year; but others allow only those years produced by multiplying 7 by the odd number, 3, 5, 7, and 9, to be climacterical. These years, they say, bring with them some remarkable change with respect to health, life, or fortune: the grand climacteric is the 63d year; but some, making two, add to this the 81st: the other remarkable climacterics are the 7th, 21st, 35th, 49th, and 56th.

CLIMATE, or CLIME, in *Geography*, a part of the surface of the earth, bounded by two circles parallel to the equator, and of such a breadth, as that the longest day in the parallel nearest the pole exceeds the longest day in that next the equator by some certain spaces; viz. half an hour. The word comes from the Greek *κλίμα*, *inclinamentum*, "an inclination."

The *beginning* of the climate is a parallel circle wherein the day is the shortest. The *end* of the climate, is that wherein the day is the longest. The climates therefore are reckoned from the equator to

the pole; and are so many bands, or zones, terminated by lines parallel to the equator; though, in strictness, there are several climates in the breadth of one zone. Each climate only differs from its contiguous ones, in that the longest day in summer is longer or shorter by half an hour in the one place than in the other. As the climates commence from the equator, the first climate at its beginning has its longest day precisely 12 hours long; at its end, 12 hours and a half: the second, which begins where the first ends, viz. at 12 hours and a half, ends at 13 hours; and so of the rest, as far as the polar circles, where what the geographers call *hour-climates* terminate, and *month-climates* commence. As an hour-climate is a space comprised between two parallels of the equator, in the first of which the longest day exceeds that in the latter by half an hour; so the month-climate is a space terminated between two circles parallel to the polar circles, whose longest day is longer or shorter than that of its contiguous one by a month or 30 days.

The ancients, who confined the climates to what they imagined the habitable parts of the earth, only allowed of seven. The first they made to pass through Meroe, the second through Sienna, the third through Alexandria, the fourth through Rhodes, the fifth through Rome, the sixth, through Pontus, and the seventh through the mouth of the Borysthenes. The moderns, who have sailed further toward the poles, make 30 climates on each side; and, in regard the obliquity of the sphere makes a little difference in the length of the longest day, instead of half an hour, some of them only make the difference of climates a quarter.

Vulgarly the term *climate* is bestowed on any country or region differing from another either in respect of the seasons, the quality of the soil, or even the manners of the inhabitants; without any regard to the length of the longest day. Abulfeda, an Arabian author, distinguishes the first kind of climates by the term *real climates*, and the latter by that of *apparent climates*. Varenus gives us a table of 30 climates; but without any regard to the refraction. Ricciolus furnishes a more accurate one, wherein the refractions are allowed for; an abstract of which follows:

Middle of Clim.	Longest Day.	Latit.	Middle of Clim.	Longest Day.	Latit.	Middle of Clim.	Latit.	Cont. Light.	North Night.	Cont. Light.	South Night.
I	12th 30	7° 18	VIII	16th 048	15	XV	66 53	31 ^d	27 ^d	30 ^d	28 ^d
II	13 0	15 36	IX	17 053	46	XVI	69 30	62	58	60	59
III	13 30	23 8	X	18 057	44	XVII	73 0	93	87	89	88
IV	14 029	49	XI	19 060	39	XVIII	78 6	124	117	120	118
V	14 30	35 35	XII	20 062	44	XIX	84 0	156	148	150	149
VI	15 040	32	XIII	22 065	10	XX	90 0	188	180	178	177
VII	15 30	44 42	XIV	24 065	54						

CLIMAX, or GRADATION, in *Rhetoric*, a figure wherein the word or expression which ends the first member of a period begins the second, and so on; so that every member will make a distinct sentence, taking its rise from the next foregoing, till the argument and period be beautifully finished; as in the following

gradation of Dr Tillotson. "After we have practised good actions a while, they become easy; and when they are easy, we begin to take pleasure in them; and when they please us, we do them frequently; and by frequency of acts, a thing grows into a habit; and confirmed habit is a kind of second nature; and so far as any

Clinch
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Clitoris.

any thing is natural, so far it is necessary; and we can hardly do otherwise; nay, we do it many times when we do not think of it."

CLINCH, in the sea-language, that part of a cable which is bended about the ring of the anchor, and then seized or made fast.

CLINCHING, in the sea-language, a kind of slight caulking used at sea, in a prospect of foul weather, about the posts: it consists in driving a little oakum into their seams, to prevent the water coming in at them.

CLINIC, a term applied by the ancient church-historians to those who received baptism on their death-bed.

CLINIC Medicine, was particularly used for the method of visiting and treating sick persons in bed, for the more exact discovery of all the symptoms of their disease.

CLINIAS, a Pythagorean philosopher, and musician, in the 65th Olympiad. He was wont to assuage his passion, being very choleric, by his lyre.

CLINOPODIUM, FIELD-BASIL. See BOTANY Index.

CLIO, in Pagan mythology, the first of the muses, daughter of Jupiter and Mnemosyne. She presided over history. She is represented crowned with laurels, holding in one hand a trumpet, and a book in the other. Sometimes she holds a plectrum or quill with a lute. Her name signifies honour and reputation, κλειος, *gloria*; and it was her office faithfully to record the actions of brave and illustrious heroes. She had Hyacintha by Pierius, son of Magnes.

CLIO, in *Zoology*, a genus of insects belonging to the order of vermes mollusca. The body is oblong and fitted for swimming; and it has two membranaceous wings placed opposite to each other. The species are three, principally distinguished by the shape of their vagina, and are all natives of the ocean.

CLIPEUS, in *Natural History*, a name given to the flat depressed centronia, from their resembling a shield. See CENTRONIA.

CLISTHENES, a famous Athenian magistrate, the author of the mode of banishing ambitious citizens by ostracism, or writing their names upon a shell; the intention was patriotic, but it was abused like all other human institutions; some of the worthiest citizens of Athens being thus exiled. He died 510 years before Christ.

CLITOMACHUS, the philosopher, flourished about 140 years before Christ. He was born at Carthage; quitted his country at 40 years of age; and went to Athens, where he became the disciple and successor of Carneades. He composed many books, but they are all lost.

CLITORIA. See BOTANY Index.

CLITORIS, in *Anatomy*, is a part of the external pudenda, situated at the angle which the nymphæ form with each other. Like the penis it has an erection, and is thought to be the principal seat of venereal pleasure. The clitoris is of different sizes in different women; but in general it is small, and covered with the labia. The preternaturally enlarged clitoris is what constitutes an hermaphrodite. When the clitoris is too large, it may be so extirpated as to remove the unnecessary part; but this requires much care, for

a farther extirpation subjects the patient to an involuntary discharge of urine.

CLITUMNUS, in *Ancient Geography*, a river of Umbria, on this side the Apennines. According to Pliny, it was a fountain consisting of several veins, situated between Hispellum and Spoletium; which soon after swelled into a very large and navigable river, running from east to west into the Tinia, and both together into the Tiber. A river famous for its milk-white flocks and herds, (Virgil). The god of the river was called *Clitumnus*.

CLITUS, brother to Alexander the Great's nurse, followed that prince in his conquests, and saved his life by cutting off the hand of Rosaces, who held an axe lifted up to kill him at the passage of the Granicus. Alexander, who had a great regard for him, some time after invited him to supper; when Clitus, at the end of the repast, being heated with wine, diminished the exploits of that prince, in order to magnify those of Philip his father. This so enraged Alexander, that he killed him with his own hand; but he was afterwards so afflicted at it, that he attempted his own life.

CLIVE, ROBERT, Lord, son of Richard Clive, Esq; of Stoyke near Drayton in Salop, was born in 1725. Toward the close of the war in 1741, he was sent as a writer in the East India service to Madras; but being fonder of the camp than the compting-house, he soon availed himself of an opportunity to exchange his pen for a pair of colours. He first distinguished himself at the siege of Pondicherry in 1748; acted under Major Laurence at the taking of Devi Cotta in Tanjore, who wrote of his military talents in high terms; commanded a small party for the taking of Arcot, and afterward defended that place against the French; and performed many other exploits, which, considering the remoteness of the scene of action, would require a long detail to render sufficiently intelligible. He was, however, in brief, looked upon and acknowledged as the man who first roused his countrymen to spirited action, and raised their reputation in the East; so that when he came over to England in 1753, he was presented, by the court of directors, with a rich sword set with diamonds, as an acknowledgment of past, and an incitement to future, services. Captain Clive returned to India in 1755, as governor of Fort St David, with the rank of lieutenant-colonel in the king's troops; when as commander of the company's troops, he, in conjunction with Admiral Watson, reduced Angria the pirate, and became master of Geria, his capital, with all his accumulated treasure. On the loss of Calcutta and the well known barbarity of the soubah Surajah Dowla, they sailed to Bengal; where they took Fort William, in January 1757; and Colonel Clive defeating the soubah's army soon after, accelerated a peace. Surajah Dowla's perfidy, however, soon produced fresh hostilities, which ended in his ruin; he being totally defeated by Colonel Clive at the famous battle of Plassey. The next day the conqueror entered Muxadabad in triumph; and placed Jaffier Ally Cawn, one of the principal generals, on the throne; the deposed soubah was soon after taken, and privately put to death by Jaffier's son. Admiral Watson died at Calcutta; but Colonel Clive commanded in Bengal the two succeeding years; he

was

Clitumnus
||
Clive.

Cloacæ
||
Clock.

was honoured by the Mogul, with the dignity of an omrah of the empire; and was rewarded by the new soubah with a grant of lands, or a jaghire, producing 27,000 l. a-year. In 1760, he returned to England, where he received the unanimous thanks of the company, was elected member of parliament for Shrewsbury, and was raised to an Irish peerage by the title of Lord Clive Baron of Plassey. In 1764, fresh disturbances taking place in Bengal, Lord Clive was esteemed the only man qualified to settle them, and was accordingly again appointed to that presidency; after being honoured with the order of the Bath, and with the rank of major-general. When he arrived in India, he exceeded the most sanguine expectation, in restoring tranquillity to the province without striking a blow, and fixed the highest ideas of the British power in the minds of the natives. He returned home in 1767; and, in 1772, when a parliamentary inquiry into the conduct of the East India company was agitated, he entered into an able justification of himself in a masterly speech in the house of commons. He died *suddenly* towards the close of the year 1774.

CLOACÆ, in antiquity, the common sewers of Rome, to carry off the dirt and soil of the city into the Tiber; justly reckoned among the grand works of the Romans. The first common sewer, called *Cloaca Maxima*, was built by Tarquinius, some say Priscus, others Superbus, of huge blocks of stone joined together without any cement, in the manner of the edifices of those early times; consisting of three rows of arches one above another, which at length conjoin and unite together; measuring in the clear 18 palms in height, and as many in width. Under these arches they rowed in boats, which made Pliny say that the city was suspended in air, and that they sailed beneath the houses. Under these arches also were ways through which carts loaded with hay could pass with ease. It began in the Forum Romanum; measured 300 paces in length; and emptied itself between the temple of Vesta and the Pons Senatorius. There were as many principal sewers as there were hills. Pliny concludes their firmness and strength from their standing for so many ages the shocks of earthquakes, the fall of houses, and the vast loads and weights moved over them.

CLOACINA, the goddess of jakes and common sewers, among the Romans.

CLOCK, a machine constructed in such a manner, and regulated so by the uniform motion of a pendulum (A), as to measure time, and all its subdivisions, with great exactness.

The invention of clocks with wheels is referred to Pacificus, archdeacon of Verona, who lived in the time of Lotharius son of Louis the Debonnair, on the credit of an epitaph quoted by Ughelli, and borrowed by him from Panvinius. They were at first called *nocturnal dials*, to distinguish them from sun-dials, which showed the hour by the sun's shadow. Others ascribe the invention to Boethius, about the year of 510. Mr Derham makes clock work of a much older standing;

and ranks Archimedes's sphere mentioned by Claudian, and that of Posidonius mentioned by Cicero, among the machines of this kind: not that either their form or use were the same with those of ours, but that they had their motion from some hidden weights or springs, with wheels, or pulleys, or some such clock-work principle. But be this as it will, it is certain the art of making clocks, such as are now in use, was either first invented, or at least retrieved, in Germany, about 200 years ago. The water-clocks, or clepsydræ, and sun-dials, have both a much better claim to antiquity. The French annals mention one of the former kind sent by Aaron, king of Persia, to Charlemagne, about the year 807, which seemed to bear some resemblance to the modern clocks: it was of brass, and showed the hours by twelve little balls of the same metal, which fell at the end of each hour, and in falling struck a bell and made it sound. There were also figures of 12 cavaliers, which at the end of each hour came forth at certain apertures or windows in the side of the clock, and shut them again, &c.

The invention of pendulum clocks is owing to the happy industry of the last age: the honour of it is disputed by Huygens and Galileo. The former, who has written a volume on the subject, declares it was first put in practice in the year 1657, and the description thereof printed in 1658. Becher, *de Nova Temporis dimetiendi Theoria*, anno 1680, contends for Galileo; and relates, though at second-hand, the whole history of the invention; adding, that one Tresler, clock-maker to the then father of the Grand Duke of Tuscany, made the first pendulum-clock at Florence, by direction of Galileo Galilei; a pattern of which was brought into Holland. The Academy de'l Cimento say expressly, that the application of the pendulum to the movement of a clock was first proposed by Galileo, and first put in practice by his son Vincenzo Galilei, in 1649. Be the inventor who he will, it is certain the invention never flourished till it came into Huygens's hands, who insists on it, that if ever Galileo thought of such a thing, he never brought it to any degree of perfection. The first pendulum-clock made in England was in the year 1662, by Mr Fromantil a Dutchman.

Amongst the modern clocks, those of Strasburg and Lyons are very eminent for the richness of their furniture, and the variety of their motions and figures. In the first, a cock claps his wings, and proclaims the hour; the angel opens a door, and salutes the virgin; and the Holy Spirit descends on her, &c. In the second, two horsemen encounter, and beat the hour on each other: a door opens, and there appears on the theatre the Virgin, with Jesus Christ in her arms; the Magi, with their retinue, marching in order, and presenting their gifts; two trumpeters sounding all the while to proclaim the procession. These, however, are excelled by two lately made by English artists, and intended as a present from the East India company to the emperor of China. The clocks we speak of are in the form of chariots, in which are placed, in a fine attitude,

Clock.

(A) A balance not unlike the fly of a kitchen-jack was formerly used in place of the pendulum.

attitude, a lady, leaning her right hand upon a part of the chariot, under which is a clock of curious workmanship, little larger than a shilling, that strikes and repeats, and goes eight days. Upon her finger fits a bird finely modelled, and set with diamonds and rubies, with its wings expanded in a flying posture, and actually flutters for a considerable time on touching a diamond button below it; the body of the bird (which contains part of the wheels that in a manner give life to it) is not the bigness of the 16th part of an inch. The lady holds in her left hand a gold tube not much thicker than a large pin, on the top of which is a small round box, to which a circular ornament set with diamonds not larger than a sixpence is fixed, which goes round near three hours in a constant regular motion. Over the lady's head, supported by a small fluted pillar no bigger than a quill, is a double umbrella, under the largelt of which a bell is fixed at a considerable distance from the clock, and seems to have no connection with it; but from which a communication is secretly conveyed to a hammer, that regularly strikes the hour, and repeats the same at pleasure, by touching a diamond button fixed to the clock below. At the feet of the lady is a gold dog; before which from the point of the chariot are two birds fixed on spiral springs; the wings and feathers of which are set with stones of various colours, and appear as if flying away with the chariot, which, from another secret motion, is contrived to run in a straight, circular, or any other direction; a boy that lays hold of the chariot, behind, seems also to push it forward. Above the umbrella are flowers and ornaments of precious stones; and it terminates with a flying dragon set in the same manner. The whole is of gold, most curiously executed, and embellished with rubies and pearls.

Of the general Mechanism of Clocks, and how they measure Time. The first figure of Plate CXLVI. is a profile of a clock: P is a weight that is suspended by a rope that winds about the cylinder or barrel C, which is fixed upon the axis *aa*; the pivots *bb* go into holes made in the plates TS, TS, in which they turn freely. These plates are made of brass or iron, and are connected by means of four pillars ZZ; and the whole together is called the *frame*.

The weight P, if not restrained, would necessarily turn the barrel C with an uniformly accelerated motion, in the same manner as if the weight was falling freely from a height. But the barrel is furnished with a ratchet wheel KK, the right side of whose teeth strikes against the click, which is fixed with a screw to the wheel DD, as represented in fig. 2. so that the action of the weight is communicated to the wheel DD, the teeth of which act upon the teeth of the small wheel *d* which turns upon the pivots *cc*. The communication or action of one wheel with another is called the *pitching*; a small wheel like *d* is called a *pinion*, and its teeth are leaves of the pinion. Several things are requisite to form a good pitching, the advantages of which are obvious in all machinery where teeth and pinions are employed. The teeth and pinion leaves should be of a proper shape, and perfectly equal among themselves; the size also of the pinion should be of a just proportion to the wheel acting into it; and its place must be at a certain distance from the wheel, beyond or within which it will make a bad pitching.

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The wheel EE is fixed upon the axis of the pinion *d*; and the motion communicated to the wheel DD by the weight is transmitted to the pinion *d*, consequently to the wheel EE, as likewise to the pinion *e* and wheel FF, which moves the pinion *f*, upon the axis of which the crown or balance wheel GH is fixed. The pivots of the pinion *f* play in holes of the plates LM, which are fixed horizontally to the plates TS. In a word, the motion begun by the weight is transmitted from the wheel GH to the palettes IK, and by means of the fork UX rivetted on the palettes, communicates motion to the pendulum AB, which is suspended upon the hook A. The pendulum AB describes, round the point A, an arc of a circle alternately going and returning. If then the pendulum be once put in motion by a push of the hand, the weight of the pendulum at B will make it return upon itself, and it will continue to go alternately backward and forward till the resistance of the air upon the pendulum, and the friction at the point of suspension at A, destroys the originally impressed force. But as, at every vibration of the pendulum, the teeth of the balance-wheel GH, act so upon the palettes IK (the pivots upon the axis of these palettes play in two holes of the potence *st*), that after one tooth H has communicated motion to the palette K, that tooth escapes; then the opposite tooth G acts upon the palette I, and escapes in the same manner; and thus each tooth of the wheel escapes the palettes IK, after having communicated their motion to the palettes in such a manner that the pendulum, instead of being stopt, continues to move.

The wheel EE revolves in an hour; the pivot *c* of the wheel passes through the plate, and is continued to *r*; upon the pivot is a wheel NN with a long socket fastened in the centre; upon the extremity of this socket *r* the minute-hand is fixed. The wheel NN acts upon the wheel O; the pinion of which *p* acts upon the wheel *gg*, fixed upon a socket which turns along with the wheel N. This wheel *gg* makes its revolution in 12 hours, upon the socket of which the hour-hand is fixed.

From the above description it is easy to see, 1. That the weight *p* turns all the wheels, and at the same time continues the motion of the pendulum. 2. That the quickness of the motion of the wheels is determined by that of the pendulum. 3. That the wheels point out the parts of time divided by the uniform motion of the pendulum.

When the cord from which the weight is suspended is entirely run down from off the barrel, it is wound up again by means of a key, which goes on the square end of the arbor at Q₁ by turning it in a contrary direction from that in which the weight descends. For this purpose, the inclined side of the teeth of the wheel R (fig. 2.) removes the click C, so that the ratchet-wheel R turns while the wheel D is at rest; but as soon as the cord is wound up, the click falls in between the teeth of the wheel D, and the right side of the teeth again act upon the end of the click, which obliges the wheel D to turn along with the barrel; and the spring A keeps the click between the teeth of the ratchet-wheel R.

We shall now explain how time is measured by the motion of the pendulum; and how the wheel E, upon the

C c

the

Clock.

the axis of which the minute-hand is fixed, makes but one precise revolution in an hour. The vibrations of a pendulum are performed in a shorter or longer time in proportion to the length of the pendulum itself. A pendulum of 3 feet $8\frac{1}{2}$ French lines in length, makes 3600 vibrations in an hour, *i. e.* each vibration is performed in a second of time, and for that reason it is called a *second pendulum*. But a pendulum of 9 inches $2\frac{1}{2}$ French lines makes 7200 vibrations in an hour, or two vibrations in a second of time, and is called a *half second pendulum*. Hence, in constructing a wheel whose revolution must be performed in a given time, the time of the vibrations of the pendulum which regulates its motion must be considered. Supposing, then, that the pendulum AB makes 7200 vibrations in an hour, let us consider how the wheel E shall take up an hour in making one revolution. This entirely depends on the number of teeth in the wheels and pinions. If the balance-wheel consists of 30 teeth, it will turn once in the time that the pendulum makes 60 vibrations; for at every turn of the wheel, the same tooth acts once on the palette I, and once on the palette K, which occasions two separate vibrations in the pendulum; and the wheel having 30 teeth, it occasions twice 30, or 60 vibrations. Consequently, this wheel must perform 120 revolutions in an hour; because 60 vibrations, which it occasions at every revolution, are contained 120 times in 7200, the number of vibrations performed by the pendulum in an hour. Now, in order to determine the number of teeth for the wheels E F, and the pinions *e f*, it must be remarked, that one revolution of the wheel E must turn the pinion *e* as many times as the number of teeth in the pinions is contained in the number of teeth in the wheel. Thus, if the wheel E contains 72 teeth, and the pinion *e* 6, the pinion will make 12 revolutions in the time that the wheel makes 1; for each tooth of the wheel drives forward a tooth of the pinion, and when the 6 teeth of the pinion are moved, a complete revolution is performed; but the wheel E has by that time only advanced 6 teeth, and has still 66 to advance before its revolution be completed, which will occasion 11 more revolutions of the pinion. For the same reason, the wheel F having 60 teeth, and the pinion *f* 6, the pinion will make 10 revolutions while the wheel performs one. Now, the wheel F being turned by the pinion *e*, makes 12 revolutions for one of the wheel E; and the pinion *f* makes 10 revolutions for one of the wheel F; consequently, the pinion *f* performs 10 times 12 or 120 revolutions in the time the wheel E performs one. But the wheel G, which is turned by the pinion *f*, occasions 60 vibrations in the pendulum each time it turns round; consequently the wheel G occasions 60 times 120 or 7200 vibrations of the pendulum while the wheel E performs one revolution; but 7200 is the number of vibrations made by the pendulum in an hour, and consequently the wheel E performs but one revolution in an hour; and so of the rest.

From this reasoning, it is easy to discover how a clock may be made to go for any length of time without being wound up: 1. By increasing the number of teeth in the wheels: 2. By diminishing the number of teeth in the pinions; 3. By increasing the length of the cord that suspends the weight; 4. By increasing

the length of the pendulum; and, 5. By adding to the number of wheels and pinions. But, in proportion as the time is augmented, if the weight continues the same, the force which it communicates to the last wheel GH will be diminished.

It only remains to take notice of the number of teeth in the wheels which turn the hour and minute hands.

The wheel E performs one revolution in an hour; the wheel NN, which is turned by the axis of the wheel E, must likewise make only one revolution in the same time; and the minute-hand is fixed to the socket of this wheel. The wheel N has 30 teeth, and acts upon the wheel O, which has likewise 30 teeth, and the same diameter; consequently the wheel O takes one hour to a revolution: now the wheel O carries the pinion *p*, which has 6 teeth, and which acts upon the wheel *q q* of 72 teeth; consequently the pinion *p* makes 12 revolutions while the wheel *q q* makes one, and of course the wheel *q q* takes 12 hours to one revolution; and upon the socket of this wheel the hour-hand is fixed. All that has been said here concerning the revolutions of the wheels, &c. is equally applicable to watches as to clocks.

The ingenious Dr Franklin contrived a clock to show the hours, minutes, and seconds, with only three wheels and two pinions in the whole movement. The dial-plate (fig. 3.) has the hours engraven upon it in spiral spaces along two diameters of a circle containing four times 60 minutes. The index A goes round in four hours, and counts the minutes from any hour by which it has passed to the next following hour. The time, therefore, in the position of the index shown in the figure is either $32\frac{1}{2}$ minutes past XII. III. or VIII.; and so in every other quarter of the circle it points to the number of minutes after the hours which the index last left in its motion. The small hand B, in the arch at top, goes round once in a minute, and shows the seconds. The wheel-work of this clock may be seen in fig. 4. A is the first or great wheel, containing 160 teeth, and going round in four hours with the index A in fig. 3. let down by a hole on its axis. This wheel turns a pinion B of 10 leaves, which therefore goes round in a quarter of an hour. On the axis of this pinion is the wheel C of 120 teeth; which goes round in the same time, and turns a pinion D of eight leaves round in a minute, with the second hand B of fig. 3. fixed on its axis, and also the common wheel E of 30 teeth for moving a pendulum (by palettes) that vibrates seconds, as in a common clock. This clock is wound up by a line going over a pulley on the axis of the great wheel, like a common thirty-hour clock. Many of these admirably simple machines have been constructed, which measure time exceedingly well. It is subject, however, to the inconvenience of requiring frequent winding by drawing up the weight, and likewise to some uncertainty as to the particular hour shown by the index A. Mr Ferguson has proposed to remedy these inconveniences by the following construction. In the dial-plate of his clock (fig. 5.) there is an opening, *abcd*, below the centre, through which appears part of a flat plate, on which the 12 hours, with their divisions into quarters, are engraven. This plate turns round in 12 hours; and the index A points out the true hour, &c. B is the

Clock.

the minute-hand, which goes round the large circle of 60 minutes whilst the plate *abcd* shifts its place one hour under the fixed index *A*. There is another opening, *efg*, through which the seconds are seen on a flat moveable ring at the extremity of a fleur-de-lis engraved on the dial-plate. *A* in fig. 6. is the great wheel of this clock, containing 120 teeth, and turning round in 12 hours. The axis of this wheel bears the plate of hours, which may be moved by a pin passing through small holes drilled in the plate, without affecting the wheel-work. The great wheel *A* turns a pinion *B* of ten leaves round in an hour, and carries the minute hand *B* on its axis round the dial-plate in the same time. On this axis is a wheel *C* of 120 teeth, turning round a pinion *D* of six leaves in three minutes; on the axis of which there is a wheel *E* of 90 teeth, that keeps a pendulum in motion, vibrating seconds by palettes, as in a common clock, when the pendulum-wheel has only 30 teeth, and goes round in a minute. In order to show the seconds by this clock, a thin plate must be divided into three times sixty, or 180 equal parts, and numbered 10, 20, 30, 40, 50, 60, three times successively; and fixed on the same axis with the wheel of 90 teeth, so as to turn round near the back of the dial-plate; and these divisions will show the seconds through the opening *efgb*, fig. 5. This clock will go a week without winding, and always show the precise hour; but this clock, as Mr Ferguson candidly acknowledges, has two disadvantages of which Dr Franklin's clock is free. When the minute-hand *B* is adjusted, the hour-plate must also be set right by means of a pin; and the smallness of the teeth in the pendulum-wheel will cause the pendulum ball to describe but small arcs in its vibrations; and therefore the momentum of the ball will be less, and the times of the vibrations will be more affected by any unequal impulse of the pendulum-wheel on the palettes. Besides, the weight of the flat ring on which the seconds are engraved will load the pivots of the axis of the pendulum-wheel with a great deal of friction, which ought by all possible means to be avoided. To remedy this inconvenience, the second plate might be omitted.

A clock similar to Dr Franklin's was made in Lincolnshire about the end of last century or beginning of this; and is now in London in the possession of a grandson of the person who made it.

A clock, showing the apparent diurnal motions of the sun and moon, the age and phases of the moon, with the time of her coming to the meridian, and the times of high and low water, by having only two wheels and a pinion added to the common movement, was contrived by Mr Ferguson, and described in his *Select Exercises*. The dial-plate of this clock (fig. 7.) contains all the twenty-four hours, of the day and night. *S* is the sun, which serves as an hour index by going round the dial-plate in twenty-four hours; and *M* is the moon, which goes round in twenty-four hours fifty minutes and a half, the time of her going round in the heavens from one meridian to the same meridian again. The sun is fixed to a circular plate (see fig. 8.) and carried round by the motion of that plate on which the twenty-four hours are engraven; and within them is a circle divided into twenty-nine and a half equal parts for the days of the moon's age, reckoning from new

moon to new moon; and each day stands directly under the time, in the twenty-four hour circle of the moon's coming to the meridian; the XII under the sun standing for noon, and the opposite XII for midnight. The moon *M* is fixed to another circular plate (fig. 6.) of the same diameter with that which carries the sun, part of which may be seen through the opening, over which the small wires *r* and *b* pass in the moon-plate. The wire *a* shows the moon's age and time of her coming to the meridian, and *b* shows the time of high-water for that day in the sun-plate. The distance of these wires answers to the difference of time between the moon's coming to the meridian and high-water at the place for which the clock is made. At London their difference is two hours and a half. Above the moon-plate there is a fixed plate *N*, supported by a wire *A*, joined to it at one end, and fixed at right angles into the dial-plate at the midnight XII. This plate may represent the earth, and the dot *L* London, or the place to which the clock is adapted. Around this plate there is an elliptic shade on the moon-plate, the highest points of which are marked high-water, and the lowest low-water. As this plate turns round below the plate *N*, these points come successively even with *L*, and stand over it at the times when it is high or low water at the given place; which times are pointed by the sun *S* on the dial-plate; and the plate *H* above XII at noon rises or falls with the tide. As the sun *S* goes round the dial-plate in twenty-four hours, and the moon *M* in twenty-four hours fifty minutes and a half, it is plain that the moon makes only twenty-eight revolutions and a half, whilst the sun makes twenty-nine and a half; so that it will be twenty-nine days and a half from conjunction to conjunction. And thus the wire *a* shifts over one day of the moon's age on the sun-plate in twenty-four hours. The phases of the moon for every day of her age may be seen through a round hole *m* in the moon-plate: thus, at conjunction or new-moon, the whole space seen through *m* is black; at opposition or full moon this space is white; at either quadrature half black and half white; and at every position the white part resembles the visible part of the moon for every day of her age. The black shaded space *Nffz* (fig. 8.) on the sun-plate serves for these appearances. *N* represents the new moon, *F* the full moon, and *f* her first quarter, and *z* her last quarter, &c. The wheel-work and tide-work of this clock are represented in fig. 9. *A* and *B* are two wheels of equal diameters: *A* has fifty-seven teeth, with a hollow axis that passes through the dial of the clock, and carries the sun-plate with the sun *S*. *B* has fifty-nine teeth, with a solid spindle for its axis, which turns within the hollow axis of *A*, and carries the moon-plate with the moon *M*: both wheels are turned round by a pinion *C* of nineteen leaves, and this pinion is turned round by the common clock-work in eight hours; and as nineteen is the third part of fifty-seven, the wheel *A* will go round in twenty-four hours; and the wheel *B* in twenty-four hours fifty minutes and a half: fifty-seven being to twenty-four as fifty-nine to twenty-four hours fifty minutes and a half very nearly. On the back of the wheel *B* is fixed an elliptical ring *D*, which, in its revolution, raises and lets down a lever *EF*, whose centre of motion is on a pin at *F*; and this, by the up-

Clock.

right bar *G*, raises and lets down the tide-plate *H* twice in the time of the moon's revolving from the meridian to the meridian again: this plate moves between four rollers *R, R, R, R*. A clock of this kind was adapted by Mr Ferguson to the movement of an old watch: the great wheel of a watch goes round in four hours; on the axis of this he fixed a wheel of twenty teeth, to turn a wheel of forty teeth on the axis of the pinion *C*; by which means that pinion was turned round in eight hours, the wheel *A* in twenty-four, and the wheel *B* in twenty-four hours fifty minutes and a half.

To this article we shall subjoin a brief account of two curious contrivances. The first, for giving motion to the parts of a clock by making it to descend along an inclined plane, is the invention of Mr Maurice Wheeler; the clock itself was formerly seen in Don Saltero's coffee-house at Chelsea. *DE*, fig. 10. is the inclined plane on which the clock *ABC* descends; this consists externally of a hoop about an inch broad, and two sides or plates standing out beyond the hoop about one-eighth of an inch all round, with indented edges, that the clock may not slide, but turn round whilst it moves down. One of these plates is inscribed with the twenty-four hours, which pass successively under the index *LP*, fig. 11. which is always in a position perpendicular to the horizon, and shows the hour on the top of the machine: for this reason the lower part of the index, or *HL*, is heaviest, that it may preponderate the other *HP*, and always keep it pendulous, with its point to the vertical hour, as the movement goes on. Instead of this index, an image may be fixed for ornament on the axis *g*, which with an erected finger performs the office of an index. In order to describe the internal part or mechanism of this clock, let *LETQ* be the external circumference of the hoop, and *ff* the same plate, on which is placed the train of wheel-work 1, 2, 3, 4, which is much the same as in other clocks, and is governed by a balance and regulator as in them. But there is no need of a spring and fusee in this clock; their effects being otherwise answered, as we shall see. In this machine the great wheel of 1 is placed in the centre, or upon the axis of the movement, and the other wheels and parts towards one side, which would therefore prove a bias to the body of the clock, and cause it to move, even on a horizontal plane, for some short distance: this makes it necessary to fix a thin plate of lead at *C*, on the opposite part of the hoop, to restore the equilibrium of the movement. This being done, the machine will abide at rest in any position on the horizontal plane *HH*; but if that plane be changed into the inclined plane *DE*, it will touch it in the point *D*; but it cannot rest there, because the centre of gravity at *M* acting in the direction *MI*, and the point *T* having nothing to support it, must continually descend, and carry the body down the plane. But now if any weight *P* be fixed on the other side of the machine, such as shall remove the centre of gravity from *M* to the point *V* in the line *LD* which passes through the point *D*, it will then rest upon the inclined plane, as in the case of the rolling cylinder. If this weight *P* be supposed not fixed, but suspended at the end of an arm, or vectis, which arm or lever is at the same time fastened to a central wheel 1, moving on the axis

Plate
CXLVIII.

M of the machine, which wheel by its teeth shall communicate with the train of wheels, &c. on the other side, and the power of the weight be just equal to the friction or resistance of the train, it will remain motionless as it did before when it was fixed; and consequently the clock also will be at rest on the inclined plane. But supposing the power of the weight *P* to be superior to the resistance of the train, it will then put it into motion, and of course the clock likewise; which will then commence a motion down the plane; while the weight *P*, its vectis *PM*, and the wheel 1, all constantly retain the same position which they have at first when the clock begins to move. Hence it is easy to understand, that the weight *P* may have such an intrinsic gravity as shall cause it to act upon the train with any required force, so as to produce a motion in the machine of any required velocity; such, for instance, as shall carry it once round in twenty-four hours: then, if the diameters of the plates *ABC* be four inches, it will describe the length of their circumference, viz. 12,56 inches, in one natural day; and therefore, if the plane be of a sufficient breadth, such a clock may go several days, and would furnish a perpetual motion, if the plane were infinitely extended. Let *SD* be drawn through *M* perpendicular to the inclined plane in the point *D*; also let *LD* be perpendicular to the horizontal line *HH*, passing through *D*; then is the angle $HDE = LDS = DMT$; whence it follows that the greater the angle of the plane's elevation is, the greater will be the arch *DT*; and consequently the further will the common centre of gravity be removed from *M*; therefore the power of *P* will be augmented, and of course the motion of the whole machine accelerated. Thus it appears, that by duly adjusting the intrinsic weight of *P*, at first to produce a motion showing the mean time as near as possible, the time may be afterwards corrected, or the clock made to go faster or slower by raising or depressing the plane, by means of the screw at *S*. The angle to which the plane is first raised is about ten degrees. The marquis of Worcester is also said to have contrived a watch that moved on a declivity. See farther *Phil. Transf. Abr.* vol. i. p. 468, &c. or N^o 161.

The other contrivance is that of *M. de Gennes* for making a clock ascend on an inclined plane. To this end let *ABC* (fig. 12.) be the machine on the inclined plane *EDE*, and let it be kept at rest upon it, or in equilibrio by the weight *P* at the end of the lever *PM*. The circular area *CF* is one end of a spring barrel in the middle of the movement, in which is included a spring as in a common watch. To this end of the barrel the arm or lever *PM* is fixed upon the centre *M*; and thus, when the clock is wound up, the spring moves the barrel, and therefore the lever and weight *P* in the situation *PM*. In doing this, the centre of gravity is constantly removed farther from the centre of the machine, and therefore it must determine the clock to move upwards, which it will continue to do as long as the spring is unbending itself; and thus the weight and its lever *PM* will preserve the situation they first have, and to do the office of a chain and fusee. *Phil. Transf.* N^o 140. or *Abridg.* vol. i. p. 467.

By stat. 9 and 10 W. III. cap. 28. § 2. no person shall export, or endeavour to export out of this kingdom,

Clock.

Clock. dom, any outward or inward box-case or dial-plate, of gold, silver, brass, or other metal, for clock or watch, without the movement in or with every such box, &c. made up fit for use, with the maker's name engraven thereon; nor shall any person make up any clock or watch without putting his name and place of abode or freedom, and no other name or place, on every clock or watch; on penalty of forfeiting every such box, case, and dial-plate, clock and watch, not made up and engraven as aforesaid; and 20l. one moiety to the king, the other to those that shall sue for the same.

Clocks, portable, or pocket, commonly denominated Watches. See the article WATCH.

Clock-Work, properly so called, is that part of the movement which strikes the hours, &c. on a bell; in contradistinction to that part of the movement of a clock or watch which is designed to measure and exhibit the time on a dial-plate, and which is termed Watch-work.

I. Of the Clock-part. The wheels composing this part are: The great or first wheel H, which is moved by the weight or spring at the barrel G: in sixteen or thirty-hour clocks, this has usually pins, and is called the pin-wheel; in eight-day pieces, the second wheel I is commonly the pin-wheel, or striking-wheel, which is moved by the former. Next the striking-wheel is the detent-wheel, or hoop-wheel K, having a hoop almost round it, wherein is a vacancy at which the clock locks. The next is the third or fourth wheel, according to its distance from the first, called the warning-wheel L. The last is the flying pinion Q, with a fly or fan, to gather air, and so bridle the rapidity of the clock's motion. To these must be added the pinion of report, which drives round the locking-wheel, called also the count-wheel; ordinarily with eleven notches in it, unequally distant, to make the clock strike the hours.

Besides the wheels, to the clock part belongs the ratch or ratchet; a kind of wheel with twelve large fangs, running concentric to the dial-wheel, and serving to lift up the detents every hour, and make the clock strike: the detents or stops, which being lifted up and let fall, lock and unlock the clock in striking; the hammer, as S, which strikes the bell R; the hammer-tails, as T, by which the striking pins draw back the hammers; latches, whereby the work is lifted up and unlocked: and lifting-pieces, as P, which lift up and unlock the detents.

The method of calculating the numbers of a piece of clock-work having something in it very entertaining, and at the same time very easy and useful, we shall give our readers the rules relating thereto: 1. Regard here needs only be had to the counting-wheel, striking-wheel, and detent-wheel, which move round in this proportion: the count-wheel commonly goes round once in 12 or 24 hours; the detent wheel moves round every stroke the clock strikes, or sometimes but once in two strokes: wherefore it follows, that, 2. As many pins as are in the pin-wheel, so many turns hath the detent-wheel in one turn of the pin-wheel; or, which is the same, the pins of the pin-wheel are the quotients of that wheel divided by the pinion of the detent-wheel. But if the detent-wheel moves but once round in two strokes of the clock, then the said

quotient is but half the number of pins. 3. As many turns of the pin-wheel as are required to perform the strokes of 12 hours (which are 78), so many turns must the pinion of report have to turn round the count-wheel once; or thus the quotient of 78, divided by the number of striking-pins, shall be the quotient for the pinion of report and the count-wheel; and this is in case the pinion of report be fixed to the arbor of the pin-wheel, which is commonly done.

An example will make all plain: The locking-wheel being 48, the pinion of report 8, the pin-wheel 78, the striking pins are 13, and so of the rest. Note also, that 78 divided by 13 gives 6, the quotient of the pinion of report. As for the warning-wheel and fly-wheel, it matters little what numbers they have; their use being only to bridle the rapidity of the motion of the other wheels.

The following rules will be of great service in this calculation. 1. To find how many strokes a clock strikes in one turn of the fusee or barrel: As the turns of the great wheel or fusee are to the days of the clock's continuance; so is the number of strokes in 24 hours, viz. 156, to the strokes of one turn of the fusee.

2. To find how many days a clock will go; As the strokes in 24 hours are to those in one turn of the fusee; so are the turns of the fusee to the days of the clock's going.

3. To find the number of turns of the fusee or barrel: As the strokes in one turn of the fusee are to those of 24 hours; so is the clock's continuance to the turns of the fusee or great wheel.

4. To find the number of leaves in the pinion of report on the axis of the great wheel: As the number of strokes in the clock's continuance is to the turns of the fusee; so are the strokes in 12 hours, viz. 78, to the quotient of the pinion of report fixed on the arbor of the great wheel.

5. To find the strokes in the clock's continuance: As 12 is to 78; so are the hours of the clock's continuance to the number of strokes in that time.

By means of the following table, clocks and watches may be so regulated as to measure true equal time.

The stars make 366 revolutions from any point of the compass to the same point again in 365 days and one minute; and therefore they gain a 365th of a revolution every 24 hours of mean solar time, near enough for regulating any clock or watch.

This acceleration is at the rate of 3 min. 55 sec. 53 thirds, 59 fourths in 24 hours; or in the nearest round numbers, 3 minutes, 56 seconds; by which quantity of time every star comes round sooner than it did on the day before.

Therefore if you mark the precise moment shown by a clock or watch when any star vanishes behind a chimney, or any other object, as seen through a small hole in a thin plate of metal, fixed in a window-shutter; 17

Days.	H.	M.	S.
1	0	3	56
2	0	7	52
3	0	11	48
4	0	15	44
5	0	19	40
6	0	23	36
7	0	27	32
8	0	31	28
9	0	35	24
10	0	39	20
11	0	43	16
12	0	47	12
13	0	51	8
14	0	55	4
15	0	59	0
16	1	2	56
17	1	6	52

Clock.

Clock.	Days.	H.	M.	S.
	18	1	10	48
	19	1	14	44
	20	1	18	40
	21	1	22	36
	22	1	26	32
	23	1	30	28
	24	1	34	24
	25	1	38	20
	26	1	42	16
	27	1	46	12
	28	1	50	8
	29	1	54	4
	30	1	58	0

and do this for several nights successively (as suppose twenty); if, at the end of that time, the star vanishes as much sooner than it did the first night, by the clock, as answers to the time denoted in the table for so many days, the clock goes true; otherwise not. If the difference between the clock and star be less than the table shows, the clock goes too fast; if greater, it goes too slow; and must be regulated accordingly, by letting down or raising up the ball of the pendulum, by little and little, by turning the screw-nut under the ball, till you find it keeps true equal time.

Thus supposing the star should disappear behind a chimney, any night when it is XII. by the clock; and that, on the 20th night afterward, the same star should disappear when the time is 41 minutes 22 seconds past X, by the clock; which being subtracted from 12 hours 0 min. 0. sec. leaves remaining 1 hour 18 minutes 40 seconds for the time the star is then faster than the clock: look in the table, and against 20, in the left-hand column, you will find the acceleration of the star to be 1 hour 18 min. 40 sec. agreeing exactly with what the difference ought to be between the clock and star; which shows that the clock measures true equal time, and agrees with the mean solar time, as it ought to do.

II. Of the *Watch*-part of a clock or watch. This is that part of the movement which is designed to measure and exhibit the time on a dial-plate; in contradistinction to that part which contributes to the striking of the hour, &c.

The several members of the watch-part are, 1. The balance, consisting of the rim, which is its circular part; and the verge, which is its spindle; to which belong two palettes or leaves, that play in the teeth of the crown-wheel. 2. The potence, or pottance, which is the strong stud in pocket-watches, wheron the lower pivot of the verge plays, and in the middle of which one pivot of the balance-wheel plays; the bottom of the pottance is called the foot, the middle part the nose, and the upper part the shoulder. 3. The cock, which is the piece covering the balance. 4. The regulator, or pendulum spring, which is the small spring, in the new pocket-watches, underneath the balance. 5. The pendulum (fig. 13); whose parts are, the verge κ , palettes 5, 5, cocks $y y y$, the rod, the fork α , the flatt 2, the bob or great ball 3, and the corrector or regulator, 4, being a contrivance of Dr Derham for bringing the pendulum to its nice vibrations. 6. The wheels, which are the crown-wheel F in pocket-pieces, and swing-wheel in pendulums; serving to drive the balance or pendulum. 7. The contrate-wheel E, which is that next the crown-wheel, &c. and whose teeth and hoop lie contrary to those of other wheels; whence the name. 8. The great, or first wheel C; which is that the fusee B, &c. immediately drives, by means of the chain or string of the spring-box or barrel A; after which are the second wheel D, third wheel, &c. Lastly, between the frame and dial-plate, is the pinion of report, which is that fixed

on the arbor of the great wheel; and serves to drive the dial wheel, as that serves to carry the hand.

For the illustration of this part of the work which lies concealed, let ABC (fig. 14.) represent the uppermost side of the frame-plate, as it appears when detached from the dial-plate: the middle of this plate is perforated with a hole, receiving that end of the arbor of the centre wheel which carries the minute hand; near the plate is fixed the pinion of report ab of 10 teeth; this drives a wheel cd of 40 teeth; this wheel carries a pinion ef of 12 teeth; and this again drives a wheel gb with 36 teeth.

As in the body of the watch the wheels every where divide the pinions; here, on the contrary, the pinions divide the wheels, and by that means diminish the motion, which is here necessary; for the hour hand, which is carried on a socket fixed on the wheel gb , is required to move but once round, while the pinion ab moves twelve times round. For this purpose the motion of the wheel cd is $\frac{1}{4}$ of the pinion ab . Again, while the wheel cd , or the pinion ef , goes once round, it turns the wheel gb but $\frac{1}{3}$ part round; consequently the motion of gb is but $\frac{1}{3}$ of $\frac{1}{4}$ of the motion of ab ; but $\frac{1}{3}$ of $\frac{1}{4}$ is $\frac{1}{12}$; *i. e.* the hour-wheel gb moves once round in the time that the pinion of report, on the arbor of the centre of the minute wheel, makes 12 revolutions, as required. Hence the structure of that part of a clock or watch which shows the time may be easily understood.

The cylinder A (fig. 13.) put into motion by a weight or inclosed spring moves the fusee B, and the great wheel C, to which it is fixed by the line or cord that goes round each, and answers to the chain of a watch.

The method of calculation is easily understood by the sequel of this article; for, suppose the great wheel C goes round once in 12 hours, then if it be a royal pendulum clock, vibrating seconds, we have $60 \times 60 \times 12 = 43200$ seconds or beats in one turn of the great wheel. But because there are 60 swings or seconds in one minute, and the seconds are shown by an index on the end of the arbor of the swing-wheel, which in those clocks is in an horizontal position; therefore, it is necessary that the swing-wheel F should have 30 teeth; whence $\frac{43200}{60} = 720$, the number to be broken into quotients for finding the number of teeth for the other wheels and pinions.

In spring-clocks, the disposition of the wheels in the watch part is such as is here represented in the figure, where the crown-wheel F is in an horizontal position; the seconds not being shown there by an index, as is done in the large pendulum clocks. Whence in these clocks the wheels are disposed in a different manner, as represented in fig. 14. where C is the great wheel, and D the centre or minute wheel, as before: but the contrate wheel E is placed on one side, and F the swing-wheel is placed with its centre in the same perpendicular line GH with the minute-wheel, and with its plane perpendicular to the horizon, as are all the others. Thus the minute and hour hands turn on the end of the arbor of the minute-wheel at a , and the second hand on the arbor of the swing-wheel at b .

Theory and calculation of the Watch-part, as laid down by

Clock.

Clock. *by the Rev. Dr Derham.*—1. The same motion, it is evident, may be performed either by one wheel and one pinion, or many wheels and many pinions; provided the number of turns of all the wheels bear the proportion to all the pinions which that one wheel bears to its pinion: or, which is the same thing, if the number produced by multiplying all the wheels together be to the number produced by multiplying all the pinions together, as that one wheel to that one pinion. Thus, suppose you had occasion for a wheel of 1440 teeth, with a pinion of 28 leaves; you make it into three wheels of 36, 8, and 5, and three pinions of 4, 7, and 1. For the three wheels, 36, 8, and 5, multiplied together, give 1440 for the wheels, and the three pinions 4, 7, and 1, multiplied together, give 28 for the pinions. Add, that it matters not in what order the wheels and pinions are set, or which pinion runs in which wheel; only, for convenience sake, the biggest numbers are commonly put to drive the rest.

2. Two wheels and pinions of different numbers may perform the same motion. Thus, a wheel of 36 drives a pinion of 4; the same as a wheel of 45 a pinion of 5; or a wheel of 90 a pinion of 10; the turns of each being 9.

3. If, in breaking the train into parcels, any of the quotients should not be liked; or if any other two numbers, to be multiplied together, are desired to be varied; it may be done by this rule. Divide the two numbers by any other two numbers which will measure them; multiply the quotients by the alternate divisors; the product of these two last numbers found will be equal to the product of the two numbers first given. Thus, if you would vary 46 times 8, divide these by any two numbers which will evenly measure them: so, 36 by 4 gives 9; and 8 by 1 gives 8; now, by the rule, 9 times 1 is 9, and 8 times 4 is 32; so that for 36 × 8, you have 32 × 9; each equal to 288. If you divide 36 by 6 and 8 by 2, and multiply as before, you have 24 × 12 = 36 × 8 = 288.

4. If a wheel and pinion fall out with cross numbers, too big to be cut in wheels, and yet not to be altered by these rules; in seeking for the pinion of report, find two numbers of the same, or a near proportion, by this rule: as either of the two given numbers is to the other, so is 360 to a fourth. Divide that fourth number, as also 360, by 4, 5, 6, 8, 9, 10, 12, 15 (each of which numbers exactly measures 360), or by any of those numbers that bring a quotient nearest to an integer. As suppose you had 147 for the wheel, and 170 for the pinion; which are too great to be cut into small wheels, and yet cannot be reduced into less, as having no other common measure but unity; say, as 170 : 147 :: 360 : 311. Or, as 147 : 170 :: 360 : 416. Divide the fourth number and 360 by one of the foregoing numbers; as 311 and 360 by 6, it gives 52 and 60; divide them by 8, you have 39 and 45; and if you divide 360 and 416 by 8, you have 45 and 52 exactly. Wherefore, instead of the two numbers 147 and 170, you may take 52 and 60, or 39 and 45, or 45 and 52, &c.

5. To come to practice in calculating a piece of watch-work: First pitch on the train or beats of the balance in an hour; as, whether a swift one of about 20,000 beats (the usual train of a common 30 hour

pocket-watch), or a slower of about 16,000 (the train of the new pendulum pocket-watches), or any other train. Next, resolve on the number of turns the fusee is intended to have, and the number of hours the piece is to go: suppose, e. gr. 12 turns, and to go 30 hours, or 192 hours (i. e. 8 days), &c. Proceed now to find the beats of the balance or pendulum in one turn of the fusee; thus in numbers; 12 : 16 :: 20000 : 26666. Wherefore, 26666 are the beats in one turn of the fusee or great wheel, and are equal to the quotients of all the wheels unto the balance multiplied together. Now this number is to be broken into a convenient parcel of quotients; which is to be done thus: first, halve the number of beats, viz. 26666, and you have 13333; then pitch on the number of the crown-wheel, suppose 17: divide 13333 by 17, and you have 784 for the quotient (or turns) of the rest of the wheels and pinions; which, being too big for one or two quotients, may be best broken into three. Choose therefore three numbers; which, when multiplied all together continually, will come nearest 784: as suppose 10, 9, and 9, multiplied continually, give 810, which is somewhat too much; therefore try again other numbers, 11, 9, 8: these, drawn one into another continually, produce 792; which is as near as can be, and is a convenient quotient. Having thus contrived the piece from the great wheel to the balance, but the numbers not falling out exactly, as you first proposed, correct the work thus: first multiply 792, the product of all the quotients pitched upon, by 17 (the notches of the crown-wheel); the product is 13464, which is half the number of beats in one turn of the fusee: Then find the true number of beats in an hour. Thus, 16 : 12 :: 13464 : 10098, which is half the beats in an hour. Then find what quotient is to be laid upon the pinion of report (by the rule given under that word). Thus, 16 : 12 :: 12 : 9, the quotient of the pinion of report. Having thus found your quotients, it is easy to determine what numbers the wheels shall have, for choosing what numbers the pinions shall have, and multiplying the pinions by their quotients, the product is the number for the wheels. Thus, the number of the pinion of report is 4, and its quotient is 9; therefore the number for the dial-wheel must be 4 × 9, or 36: so the next pinion being 5, its quotient 11, therefore the great wheel must be 5 × 11 = 55; and so of the rest.

Such is the method of calculating the numbers of a 16 hour watch. Which watch may be made to go longer by lessening the train, and altering the pinion of report. Suppose you could conveniently slacken the train to 16000; then say, As $\frac{1}{2}$ 16000, or 8000 : 13464 :: 12 : 20; so that this watch will go 20 hours. Then for the pinion of report, say (by the rule given under that word), as 20 : 12 :: 12 : 7. So that 7 is the quotient of the pinion of report. And as to the numbers, the operation is the same as before, only the dial-wheel is but 28; for its quotient is altered to 7. If you would give numbers to a watch of about 10,000 beats in an hour, to have 12 turns of the fusee, to go 170 hours, and 17 notches in the crown-wheel; the work

$$\begin{array}{r} 4) 36 (9 \\ 5) 55 (11 \\ 5) 45 (9 \\ 5) 40 (8 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 4) 28 (7 \\ 5) 55 (11 \\ 5) 45 (9 \\ 5) 40 (8 \\ \hline 17 \end{array}$$

Clock.

Clock. is the same, in a manner, as in the last example : and consequently thus: as 12 : 170 :: 10000 : 141666, which fourth number is the beats in one turn of the fusee; its half, 70833, being divided by 17, gives 4167 for the quotient; and because this number is too big for three quotients, therefore choose four, as 10, 8, 8, $6\frac{1}{2}$; whose product into 17 makes 71808, nearly equal to half the true beats in one turn of the fusee. Then say, as 170 : 12 : 71808 : 5069, which is half the true train of your watch. And again, 170 : 12 : $12 : \frac{144}{70}$, the denominator of which expresses the pinion of report, and the numerator is the number of the dial-wheel. But these numbers being too big to be cut in small wheels, they must be varied by the fourth rule above. Thus:

As 144 : 170 :: 360 : 425 :

Or 170 : 144 :: 360 : 305.

24) 20 ($\frac{10}{24}$) Then dividing 360, and either of these two fourth proportionals (as directed by 6) 60 (10 the rule), suppose by 15; you will have 6) 48 (8 $\frac{24}{8}$ or $\frac{30}{24}$; then the numbers of the whole 5) 40 (8 movement will stand as in the margin. 5) 33 ($6\frac{1}{2}$ Such is the calculation of ordinary watches, to show the hour of the day :

17 in such as show minutes, and seconds, the process is thus :

1. Having resolved on the beats in an hour; by dividing the designed train by 60, find the beats in a minute; and accordingly, find proper numbers for the crown-wheel and quotients, so as that the minute-wheel shall go round once in an hour, and the second wheel once in a minute.

Suppose, you shall choose a pendulum of seven inches, which vibrates 142 strokes in a minute, and 8520 in an hour. Half these sums are 71, and 4260. Now, the first work is to break this 71 into a good proportion, which will fall into one quotient, and the crown-wheel. Let the crown-wheel have 15 notches; then 71, divided by 15, gives nearly 5; so a crown-wheel of 15, and a wheel and pinion whose quotient is 5, will go round in a minute to carry a hand to show seconds. For a hand to go

8) 40 (5 round in an hour to show minutes, because there are 60 minutes in an hour, it is but 15 breaking 60 into good quotients (suppose 10 and 6, or 8 and $7\frac{1}{2}$ &c.): and it is

8) 64 (8 done. Thus, 4260 is broken as near as 8) 60 ($7\frac{1}{2}$ can be into proper numbers. But since it

8) 40 (5 does not fall out exactly into the above-mentioned numbers, you must correct (as 15 before directed), and find the true number

of beats in an hour, by multiplying 15 by 5, which makes 75; and 75 by 60 makes 4500, which is half the true train. Then find the beats in one turn of the fusee; thus, 16 : 192 :: 4500 : 54000; which last is half the beats in one turn of the fusee. This 54000 being divided by 4500 (the true

9) 108 (12 numbers already pitched on), the quo- 8) 64 (8 tient will be 12; which, not being too big 8) 60 ($7\frac{1}{2}$ for a single quotient, needs not be divided 8) 40 (5 into more; and the work will stand as in the margin. As to the hour hand, the

15 great wheel, which performs only one revolution in 12 turns of the minute-wheel,

will show the hour; or it may be done by the minute-wheel. Clock.

It is requisite for those who make nice astronomical observations, to have watches that make some exact number of beats per second, without any fraction; but we seldom find a watch that does. As four beats per second would be a very convenient number, we shall here give the train for such a watch, which would (like most others) go 30 hours, but is to be wound up once in 24 hours.

The fusee and first wheel to go round in four hours. This wheel has 48 teeth, and it turns a pinion of 12 leaves, on whose axis is the second wheel, which goes round in one hour, and carries the minute-hand. This wheel has 60 teeth, and turns a pinion of 10 leaves; on whose axis is the third wheel of 60 teeth, turning a pinion of 6 leaves; on whose axis is the fourth (or contrate) wheel, turning round in a minute, and carrying the small hand that shows the seconds, on a small circle on the dial-plate, divided into 60 parts: this contrate wheel has 48 teeth, and turns a pinion of 6 leaves; on whose axis is the crown or balance-wheel of 15 teeth, which makes 30 beats in each revolution.

The crown-wheel goes 480 times round in an hour, and 30 times 480 make 14400, the number of beats in an hour. But one hour contains 3600 seconds; and 14400 divided by 3600 quotes 4, the required number of beats in a second.

The fusee must have $7\frac{1}{2}$ turns, to let the chain go so many times round it. Then, as 1 turn is to 4 hours, so is $7\frac{1}{2}$ turns to 30 hours, the time the watch would go after it is wound up.

See further the articles MOVEMENT, TURN, &c. And for the history and particular construction of Watches properly so called, see the article WATCH.

CLODIA LEX, *de Cypro*, was enacted by the tribune Clodius, in the year of Rome 607, to reduce Cyprus into a Roman province, and expose Ptolemy king of Egypt to sale in his regal ornaments. It empowered Cato to go with the praetorian power and see the auction of the king's goods, and commissioned him to return the money to Rome. Another, *de Magistratibus*, 695, by Clodius the tribune. It forbade the censors to put a stigma or mark of infamy upon any person who had not been actually accused and condemned by both the censors. Another, *de Religione*, by the same, 696, to deprive the priest of Cybele, a native of Pessinus, of his office, and confer the priesthood upon Brotigonus, a Gallogrecian. Another, *de Provinciis*, 695, which nominated the provinces of Syria, Babylon, and Persia, to the consul Gabinius, and Achaia, Thessaly, Macedon, and Greece, to his colleague Piso, with proconsular power. It empowered them to defray the expences of their march from the public treasury. Another, 695, which required the same distribution of corn among the people gratis, as had been given them before at six asses and a triens the bushel. Another, 695, by the same, *de Judiciis*. It called to an account such as had executed a Roman citizen without a judgment of the people and all the formalities of a trial. Another, by the same, to pay no attention to the appearances of the heavens while any affair was before

Fig. 3.

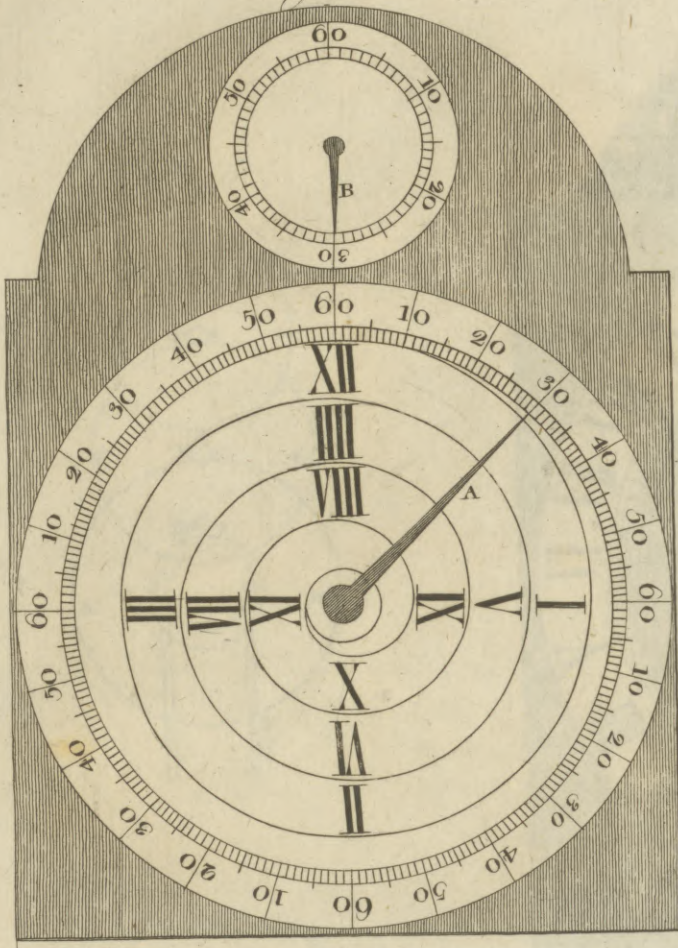


Fig. 1.

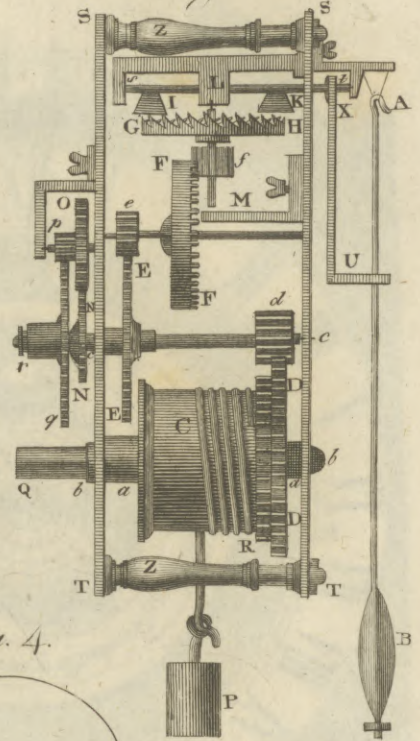


Fig. 4.

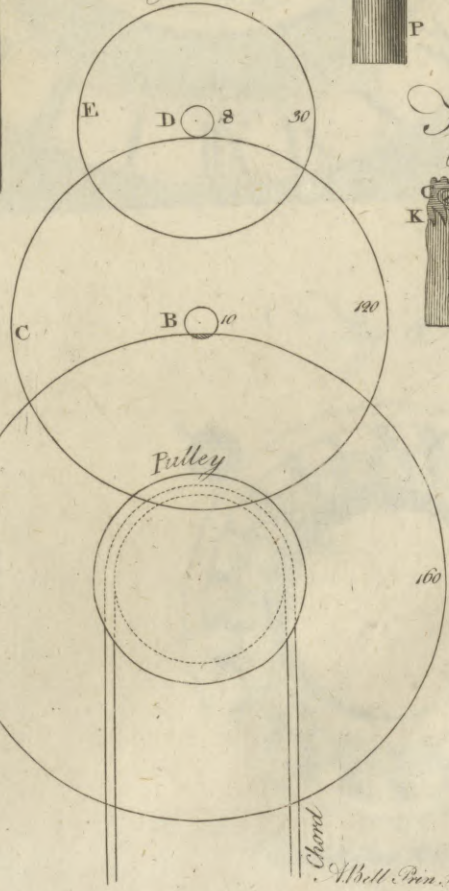


Fig. 2.



Fig. 5.



Chond
W. Bell Pin. Mat. Sculptor first

PLATE CXXVI

CLOCK

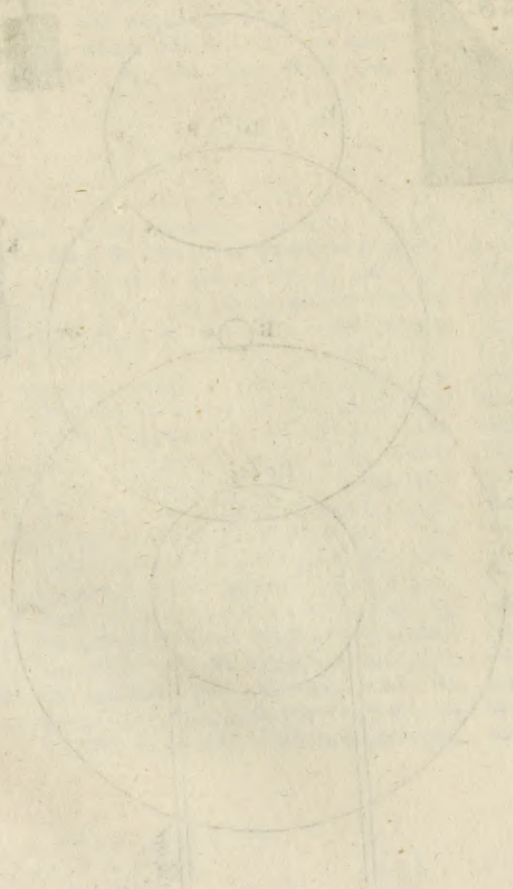
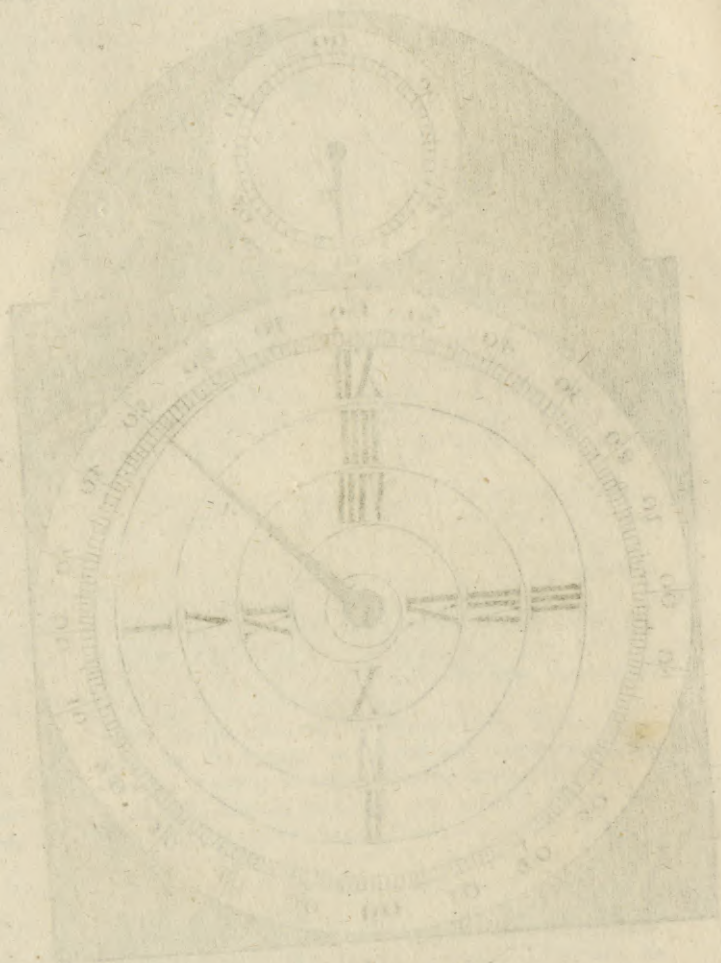


Fig. 6.

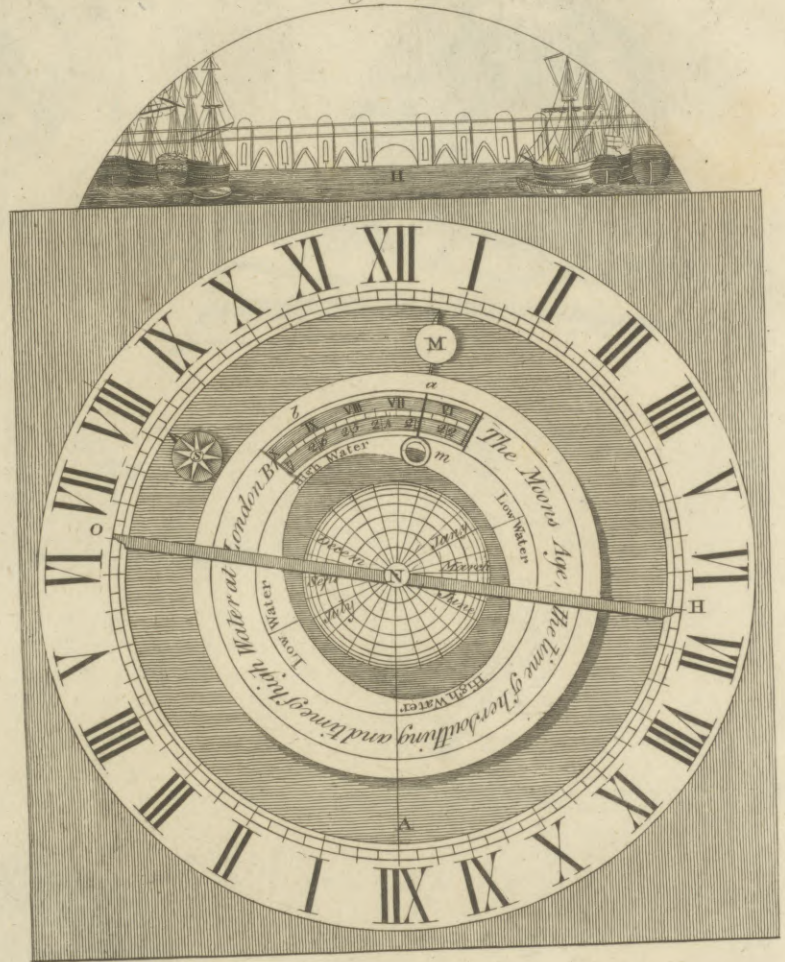
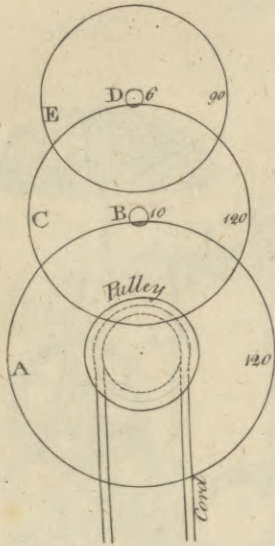


Fig. 9.

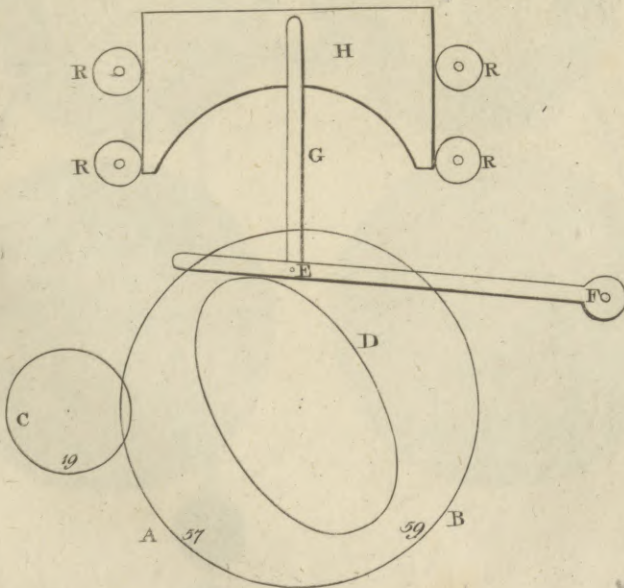
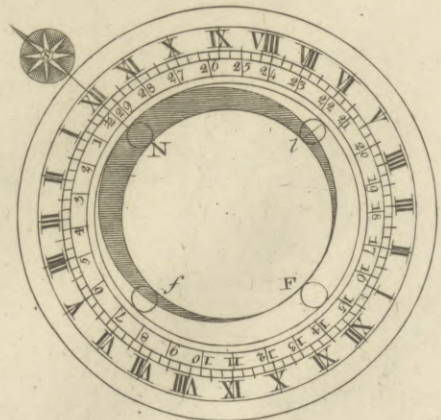


Fig. 8.



A. Bell Pin. Mal. Sculptor fecit.

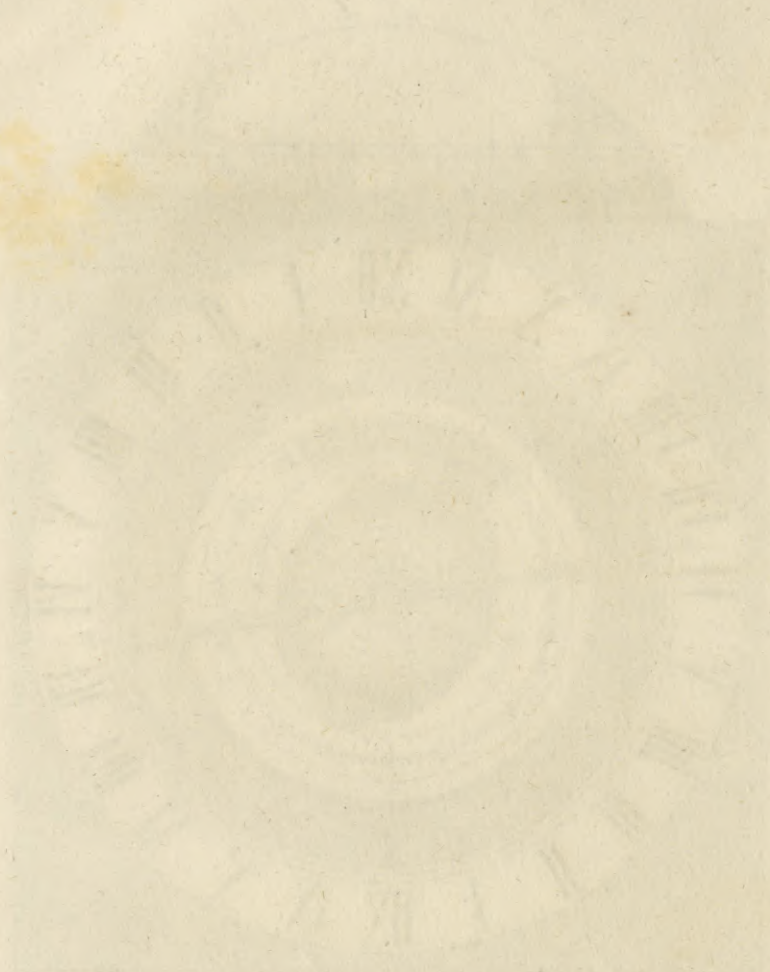


Fig. 14.

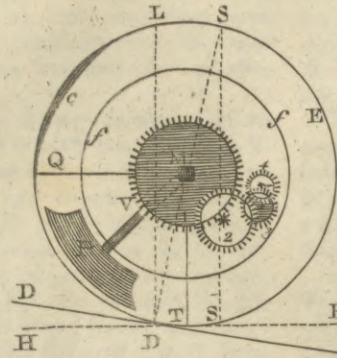
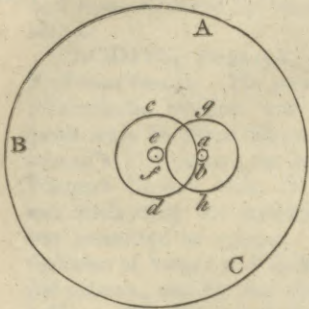


Fig. 10.

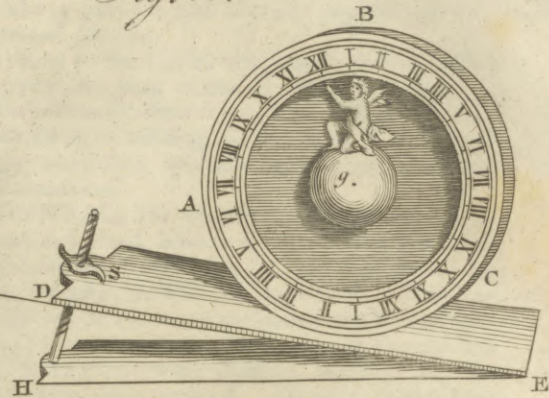


Fig. 13.

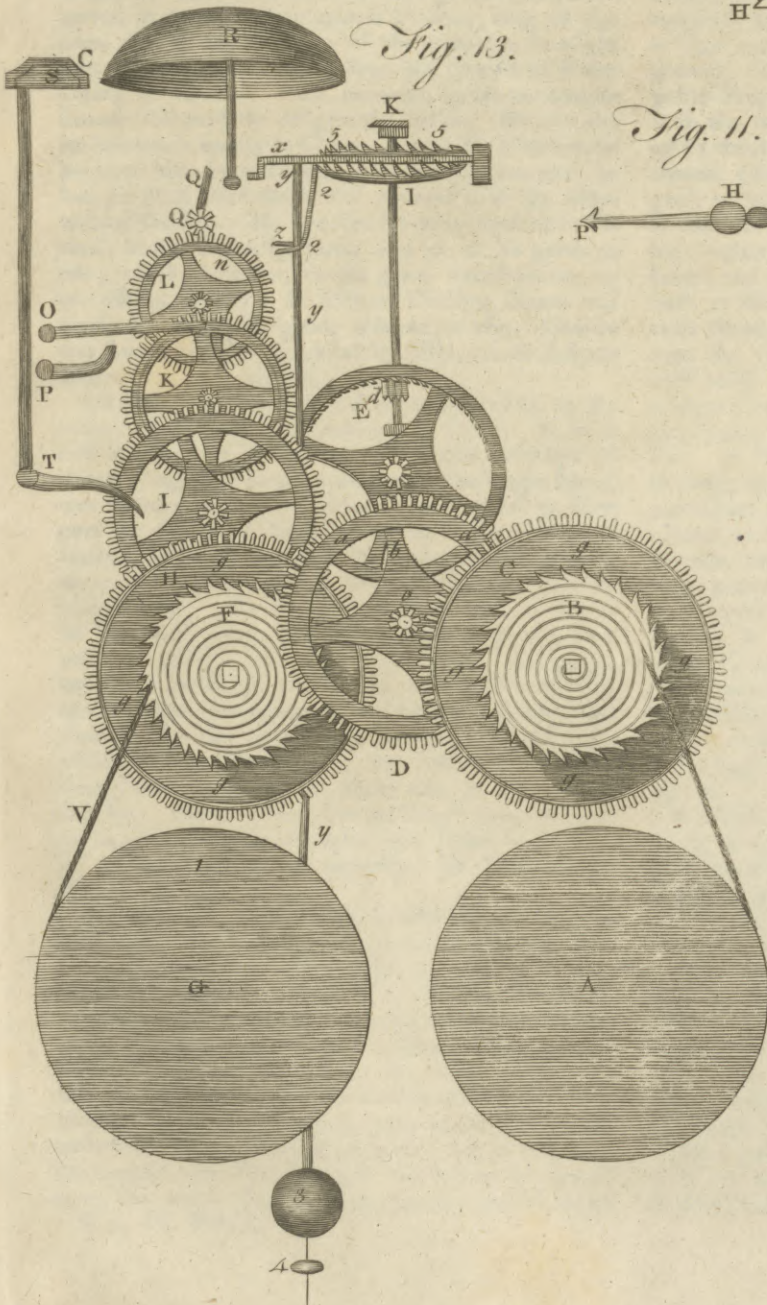


Fig. 11.



Fig. 12.

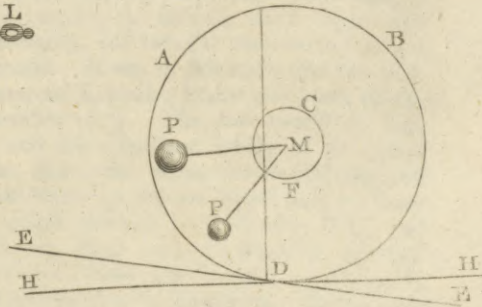
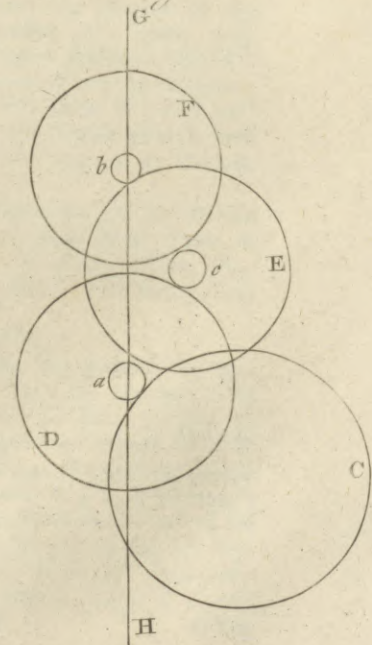
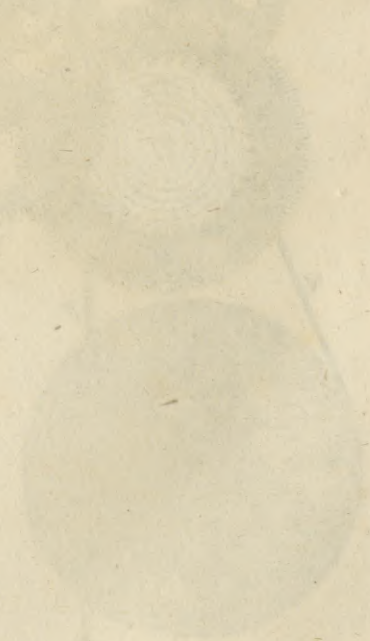
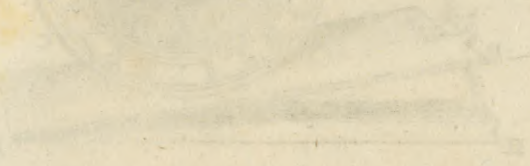


Fig. 15.



A. Bell. Prin. M. de Sculptor. fecit.



Clodius fore the people. Another, to make the power of the tribunes free in making and proposing laws. Another, to re-establish the companies of artists which had been instituted by Numa, but since his time abolished.

CLODIUS, PUBLIUS, a Roman descended of an illustrious family. He made himself famous for his licentiousness, avarice, and ambition. He committed incest with his three sisters, and introduced himself in women's clothes into the house of Julius Cæsar, whilst Pompeia Cæsar's wife, of whom he was enamoured, was celebrating the mysteries of Ceres, where no man was permitted to appear. He was accused for this violation of human and divine laws; but he made himself tribune, and by that means screened himself from justice. He descended from a patrician into a plebeian family to become a tribune. He was such an enemy to Cato, that he made him go with prætorian power, in an expedition against Ptolemy king of Cyprus, that by the difficulty of the campaign he might ruin his reputation, and destroy his interest at Rome during his absence. Cato, however, by his uncommon success frustrated the designs of Clodius. He was also an inveterate enemy to Cicero, and by his influence he banished him from Rome, partly on pretence that he had punished with death and without trial the adherents of Catiline. He wreaked his vengeance upon Cicero's house, which he burnt, and set all his goods to sale; which, however, to his great mortification, no one offered to buy. In spite of Clodius, Cicero was recalled, and all his goods restored to him. Clodius was some time after murdered by Milo, whose defence Cicero took upon himself.

CLOGHER, an episcopal town of Ireland, in the county of Tyrone, and province of Ulster. It sends two members to parliament. In a very early age an abbey of regular canons, dedicated to the Virgin Mary, was founded here. St Patrick is said to have presided over the church of Clogher; and having appointed St Kertenn to be his successor, he resigned this government, and went to Armagh, where he founded his celebrated abbey. On the 20th of April 1396, a dreadful fire burnt to the ground the church, the two chapels, the abbey, the court of the bishops, and thirty-two other buildings, with all the sacerdotal vestments, utensils, &c. belonging to the bishop's chapter and church. In the year 1610, on the 24th of July, whilst George Montgomery was bishop of Clogher, King James annexed this abbey and its revenues to that see. The see (valued in the king's books at 350l. per annum by extent returned 15th James I.) is reputed to be worth 4000l. annually. W. Long. 6. 50. N. Lat. 54. 30.

CLOISTER (*Clastrum*), a habitation surrounded with walls, and inhabited by canons or religious, &c. In a more general sense, cloister is used for a monastery of religious of either sex. In a more restrained sense, cloister is used for the principal part of a regular monastery, consisting of a square built around; ordinarily between the church, the chapter-house, and the refectory; and over which is the dormitory. The cloisters served for several purposes in the ancient monasteries. Petrus Blesensis observes, that it was here the monks held their lectures: the lecture of morality at the north side, next the church; the school on

the west, and the chapter on the east; spiritual meditation, &c. being reserved for the church. Lanfranc observes, that the proper use of the cloister was for the monks to meet in, and converse together, at certain hours of the day.

The form of the cloister was square; and it had its name *claustrum*, from *claudo*, "I shut or close;" as being inclosed on its four sides with buildings. Hence, in architecture, a building is still said to be in form of a cloister, when there are buildings on each of the four sides of the court.

CLONMELL, the assize town of the county of Tipperary in Ireland, is situated on the river Suir, hath a barrack for two troops of horse, and is governed by a mayor, recorder, bailiffs, and town-clerk. The river is navigable from this town to Carrick and Waterford; and there is some trade carried on here in the woollen branch, particularly by the Quakers, who are very numerous in this neighbourhood. There is a spring here of Spa water, that issues out of the side of a rising ground, that is, notwithstanding, overlooked by a pretty steep hill, on that side of the river Suir which is in the county of Waterford. The cures performed by drinking this water in the scurvy, and other chronic distempers, drew thither, some years ago, a great resort of people; but fashion, which reigns with an absolute authority, has brought other waters of late into higher credit. It was in this town that the celebrated and reverend Laurence Sterne was born, on the 24th of November 1713. The town consists of four cross streets, and has a spacious bridge of 20 arches over the river Suir; the market-house is strong and well built, and there is a charter-school here for forty children, to which the late John Dawson, Esq; and Sir Charles Moore, Bart. were considerable benefactors. A Dominican friary was founded at Clonmell, in 1269, and dedicated to St Dominick. In the same year Otho de Grandison erected one of the most magnificent in Ireland. In it was kept an image of St Francis, respecting the miracles wrought by which, many marvellous stories are circulated. This town is very ancient, being built before the invasion of the Danes: it was formerly defended by a square wall. Oliver Cromwell, who found more resistance in this place than any other of his conquests in the kingdom, demolished the castles and fortifications, of which now only the ruins remain: the chief Gothic church here is still kept in good repair. W. Long. 7. 27. N. Lat. 54. 14.

CLOSE, in *Heraldry*. When any bird is drawn in a coat of arms with its wings close down about it, (i. e. not displayed), and in a standing posture, they blazon it by this word *close*; but if it be flying, they call it *volant*. See *VOLANT*.

CLOSE, in *Music*. See *CADENCE*.

CLOSE-HAULED, in *Navigation*, the general arrangement or trim of a ship's sails when she endeavours to make a progress in the nearest direction possible towards that point of the compass from which the wind blows. In this manner of sailing, the keel commonly makes an angle of six points with the line of the wind; but sloops and some other small vessels are said to sail almost a point nearer. All vessels, however, are supposed to make nearly a point of leeway when close-hauled, even when they have the advantage of a good sailing

Clonmell
||
Close-hauled.

Cloth.
Close-quarters
||
Cloth.

failing breeze and smooth water. The angle of leeway, however, increases in proportion to the increase of the wind and sea. In this disposition of the sails, they are all extended sidewise on the ship, so that the wind as it crosses the ship obliquely toward the stern from forwards, may fill their cavities. But as the current of winds also enters the sails in an oblique direction, the effort of it to make the ship advance is considerably diminished: she will therefore make the least progress when sailing in this manner. The ship is said to be close-hauled, because at this time her *tacks*, or lower corners of the principal sails, are drawn close down to her side to windward, the sheets hauled close-aft, and all the bow-lines drawn to their greatest extension to keep the sails steady.

Close-Quarters, certain strong barriers of wood, stretching across a merchant-ship in several places. They are used as places of retreat when a ship is boarded by her adversary, and are therefore fitted with several small loop holes through which to fire the small arms, and thereby annoy the enemy and defend themselves. They are likewise furnished with several caissons called *powder-chests*, which are fixed upon the deck, and filled with powder, old-nails, &c. and may be fired at any time from the close-quarters upon the boarders.

*Falconer's
Dict. of the
Marine.*

We have known an English merchant-ship of 16 guns, and properly fitted with close-quarters, defeat the united efforts of three French privateers who boarded her in the last war, after having engaged at some distance nearly a day and a half, with very few intervals of rest. Two of the cruisers were equipped with twelve guns each, and the other with eight. The French sailors were, after boarding, so much exposed to continued fire of musquetry and coehorns charged with granadoes, that a dreadful scene of carnage ensued, in which the decks were soon covered with the dead bodies of the enemy, several of which the boarders, in their hurry to escape, had left behind.

CLOT-BIRD: a species of FRINGILLA. See ORNITHOLOGY Index.

CLOTH, in commerce, a manufacture made of wool, wove in the loom.

Cloths are of divers qualities, fine or coarse. The goodness of cloth, according to some, consists in the following particulars: 1. That the wool be of a good quality, and well dressed. 2. It must be equally spun, carefully observing that the thread of the warp be finer and better twisted than that of the woof. 3. The cloth must be well wrought, and beaten on the loom, so as to be everywhere equally compact. 4. The wool must not be finer at one end of the piece than in the rest. 5. The lifts must be sufficiently strong, of the same length with the stuff, and must consist of good wool, hair, or ostrich-feathers; or, what is still better, of Danish dog's hair. 6. The cloth must be free from knots and other imperfections. 7. It must be well scoured with fullers earth, well fullered with the best white soap, and afterwards washed in clear water. 8. The hair or nap must be well drawn out without the teazel, without being too much opened. 9. It must be shorn close without making it thread-bare. 10. It must be well dried. 11. It must not be tenter-stretched, to force it to its just dimensions.

12. It must be pressed cold, not hot-pressed, the latter being very injurious to woollen cloth.

Cloth.

Manufacturing of white Cloths which are intended for dyeing. The best wool for the manufacturing of cloths are those of England and Spain, especially those of Lincolnshire and Segovia. To use those wools to the best advantage, they must be scoured, by putting them into a liquor somewhat more than lukewarm, composed of three parts fair water and one of urine. After the wool has continued long enough in the liquor to soak, and dissolve the grease, it is drained and well washed in running water. When it feels dry, and has no smell but the natural one of the sheep, it is said to be duly scoured.

After this, it is hung to dry in the shade; the heat of the sun making it harsh and inflexible: when dry, it is beat with rods upon hurdles of wood, or on cords, to cleanse it from dust and the grosser filth; the more it is thus beat and cleansed, the softer it becomes, and the better for spinning. After beating, it must be well picked, to free it from the rest of the filth that had escaped the rods.

It is now in a proper condition to be oiled, and carded on large iron cards placed slopewise. Olive oil is esteemed the best for this purpose; one-fifth of which should be used for the wool intended for the woof, and a ninth for that designed for the warp. After the wool has been well oiled, it is given to the spinners, who first card it on the knee with small fine cards, and then spin it on the wheel, observing to make the thread of the warp smaller by one-third than that of the woof, and much compacter twisted.

The thread thus spun, is reeled, and made into skeins. That designed for the woof is wound on little tubes, pieces of paper, or rushes, so disposed as that they may be easily put in the eye of the shuttle. That for the warp is wound on a kind of large wooden bobbins, to dispose it for warping. When warped, it is stiffened with size; the best of which is that made of shreds of parchment; and when dry, is given to the weavers, who mount it on the loom.

The warp thus mounted, the weavers, who are two to each loom, one on each side, tread alternately on the treddle, first on the right step, and then on the left, which raises and lowers the threads of the warp equally; between which they throw transversely the shuttle from the one to the other; and every time that the shuttle is thus thrown, and a thread of the woof inserted within the warp, they strike it conjointly with the same frame, wherein is fastened the comb or reed, between whose teeth the threads of the warp are passed, repeating the stroke as often as is necessary.

The weavers having continued their work till the whole warp is filled with the woof, the cloth is finished; it is then taken off the loom by unrolling it from the beam whereon it had been rolled in proportion as it was wove; and now given to be cleansed of the knots, ends of threads, straws, and other filth, which is done with iron nippers.

In this condition it is carried to the fullery, to be scoured with urine, or a kind of potters clay, well steeped in water, put along with the cloth in the trough wherein it is fullered. The cloth being again cleared

Cloth
||
Cloud.

cleared from the earth or urine, is returned to the former hands to have the lesser filth, small straws, &c. taken off as before: then it is returned to the fuller to be beat and fulled with hot water, wherein a suitable quantity of soap has been dissolved; after fulling, it is taken out to be smoothed or pulled by the lifts lengthwise, to take out the wrinkles, crevices, &c.

The smoothing is repeated every two hours, till the fulling be finished, and the cloth brought to its proper breadth; after which it is washed in clear water, to purge it of the soap, and given wet to the carders to raise the hair or nap on the right side with the thistle or weed. After this preparation the cloth-worker takes the cloth, and gives it its first cut or shearing; then the carders resume it, and after wetting, give it as many more courses with the teazle, as the quality of the stuff requires, always observing to begin against the grain of the hair, and to end with it; as also to begin with a smoother thistle, proceeding still with one sharper and sharper, as far as the sixth degree.

After these operations, the cloth being dried, is returned to the cloth-worker, who sheers it a second time, and returns it to the carders, who repeat their operation as before, till the nap be well ranged on the surface of the cloth, from one end of the piece to the other.

The cloth thus wove, scoured, napped, and shorn, is sent to the dyer; when dyed, it is washed in fair water, and the worker takes it again wet as it is, lays the nap with a brush on the table, and hangs it on the tenters, where it is stretched both in length and breadth sufficiently to smooth it, set it square, and bring it to its proper dimensions, without straining it too much; observing to brush it afresh, the way of the nap, while a little moist, on the tenters.

When quite dry, the cloth is taken off the tenters, and brushed again on the table, to finish the laying of the nap; after which it is folded, and laid cold under a press, to make it perfectly smooth and even, and give it a gloss.

Lastly, the cloth being taken out of the press, and the papers, &c. for glossing it removed, it is in a condition for sale or use. With regard to the manufacture of mixt cloths, or those wherein the wools are first dyed, and then mixt, spun, and wove of the colours intended, the process, except what relates to the colour, is mostly the same with that just represented.

CLOTH made from Vegetable Filaments. See BARK and FILAMENTS.

Incombustible CLOTH. See ASBESTOS.

CLOTHO, the youngest of the three Parcae, daughters of Jupiter and Themis. She was supposed to preside over the moment that we are born. She held the distaff in her hand and spun the thread of life, whence her name *κλωθειν*, *to spin*. She was represented wearing a crown with seven stars, and covered with a variegated robe.

CLOUD, a collection of vapours suspended in the atmosphere.

1
Cause of
the forma-
tion of
clouds un-
certain.

That the clouds are formed from the aqueous vapours, which before were so closely united with the atmosphere as to be invisible, is universally allowed:

but it is no easy matter to account for the long continuance of some very opaque clouds without dissolving; or to give a reason why the vapours, when they have once begun to condense, do not continue to do so till they at last fall to the ground in the form of rain or snow, &c. The general cause of the formation of clouds, it has been supposed, is a separation of the latent heat from the water of which the vapour is composed. The consequence of this separation must be the condensation of that vapour, in some degree at least: in such case, it will first appear as a smoke, mist, or fog; which if interposed betwixt the sun and earth, will form a cloud; and the same causes continuing to act, the cloud will produce rain or snow. But though the separation of this latent heat in a certain degree is the immediate cause of the formation of clouds, the remote cause, or the changes produced in the atmosphere, whereby such a separation may be induced, are much more difficult to be discovered. In common observation, we see that vapour is most powerfully condensed by cold substances, such as metals, water, &c. But cold alone cannot in all cases cause the condensation of the atmospherical vapours, otherwise the nights behaved to be always foggy or cloudy, owing to the vapours, raised throughout the day by the heat of the sun, being condensed by the superior coldness of the night. Great rains will happen in very warm weather, when the union of the vapours with the atmosphere ought rather to be promoted than dissolved, if cold was the only agent in their condensation. The serenity of the atmosphere, also, in the most severe frosts, abundantly shows that some other cause besides mere heat or cold is concerned in the formation of clouds, and condensation of the atmospherical vapours.

Cloud.

The electric fluid is now so generally admitted as an agent in all the great operations of nature, that it is no wonder to find the formation of clouds attributed to it. This hath accordingly been given by S. Beccaria as the cause of the formation of all clouds whatsoever, whether of thunder, rain, hail, or snow. The first, he thinks, are produced by a very great power of electricity, and the others by one more moderate. But though it is certain that all clouds, or even fogs and rain, are electrified in some degree, it still remains a question, whether the clouds are formed in consequence of the vapour whereof they are composed being first electrified, or whether they become electrified in consequence of its being first separated from the atmosphere, and in some measure condensed. This hath not yet, as far as we know, been ascertained by the experiments of Beccaria, or any other person; and indeed, notwithstanding the multitude of electrical discoveries that have lately been made, there seems to be little or no foundation for ascertaining it. Electricity is known to be in many cases a promoter of evaporation; but no experiments have yet been brought to prove, that electrified air parts with its moisture more readily than such as is not electrified; so that, till the properties of electrified air are farther investigated, it is impossible to lay down any rational theory of the formation of clouds upon this principle.

But whether the clouds are produced, i. e. the invisible vapours floating in the atmosphere condensed so as to become visible, by means of electricity or not, it is certain that they do contain the electric fluid in

2
Not always
owing to
cold.

3
Electricity
probably
concerned.

4
Clouds of-
ten prodi-
giously e-
lectrified.

Cloud.
5
Terrible
destruction
by an elec-
trified cloud
in Java.

prodigious and inconceivable quantities, and many very terrible and destructive phenomena have been occasioned by clouds very highly electrified. The most extraordinary instance of this kind perhaps on record happened in the island of Java in the East Indies in August 1772. On the 11th of that month, at midnight, a bright cloud was observed covering a mountain in the district called *Cheribon*, and at the same time several reports were heard like those of a gun. The people who dwelt upon the upper parts of the mountain not being able to fly fast enough, a great part of the cloud, almost three leagues in circumference, detached itself under them, and was seen at a distance rising and falling like the waves of the sea, and emitting globes of fire so luminous, that the night became as clear as day. The effects of it were astonishing; every thing was destroyed for seven leagues round; the houses were demolished; plantations were buried in the earth; and 2140 people lost their lives, besides 1500 head of cattle, and a vast number of horses, goats, &c.

6
By another
in the island
of Malta.

Another instance of a very destructive cloud, the electric qualities of which will at present scarcely be doubted, is related by Mr Brydone, in his *Tour through Malta*. It appeared on the 29th of October 1757. About three quarters of an hour after midnight, there was seen to the south-west of the city of *Melita*, a great black cloud, which, as it approached, changed its colour, till at last it became like a flame of fire mixed with black smoke. A dreadful noise was heard on its approach, which alarmed the whole city. It passed over the port, and came first on an English ship, which in an instant was torn in pieces, and nothing left but the hulk; part of the masts, sails, and cordage, were carried to a considerable distance along with the cloud. The small boats and felloques that fell in its way were all broken to pieces and sunk. The noise increased and became more frightful. A sentinel terrified at its approach ran into his box; but both he and it were lifted up and carried into the sea, where he perished. It then traversed a considerable part of the city, and laid in ruins almost every thing that stood in its way. Several houses were laid level with the ground, and it did not leave one steeple in its passage. The bells of some of them, together with the spires, were carried to a considerable distance; the roofs of the churches demolished and beat down, &c. It went off at the north-east point of the city, and demolishing the light-house, is said to have mounted up into the air with a frightful noise; and passed over the sea to Sicily, where it tore up some trees, and did other damage; but nothing considerable, as its fury had been mostly spent at Malta. The number of killed and wounded amounted to near 200; and the loss of shipping, &c. was very considerable.

7
Instance of
two people
involved in
a thunder-
cloud.

The effects of thunder-storms, and the vast quantity of electricity collected in the clouds which produce these storms, are so well known, that it is superfluous to mention them. It appears, however, that even these clouds are not so highly electrified as to produce their fatal effects on those who are immersed in them. It is only the discharge of part of their electricity upon such bodies as are either not electrified at all, or not so highly electrified as the cloud, that does all the mischief. We have, however, only the following in-

stance on record, of any persons being immersed in the body of a thunder-cloud. Professor Saussure, and young Mr Jalabert, when travelling over one of the high Alps, were caught among clouds of this kind; and to their astonishment, found their bodies so full of electrical fire, that spontaneous flashes darted from their fingers with a crackling noise, and the same kind of sensation as when strongly electrified by art.

The height of clouds in general is not great; the summits of very high mountains being commonly quite free from them, as Mr Brydone experienced in his journey up Mount *Ætna*; but those which are most highly electrified descend lowest, their height being often not above seven or eight hundred yards above the ground; nay, sometimes thunder-clouds appear actually to touch the ground with one of their edges*: but the generality of clouds are suspended at the height of a mile, or little more, above the earth. Some, however, have imagined them to arise to a most incredible and extravagant height. Maignan of Thoulouze, in his *Treatise of Perspective*, p. 93. gives an account of an exceeding bright little cloud that appeared at midnight in the month of August, which spread itself almost as far as the zenith. He says that the same thing was also observed at Rome; and from thence concludes that the cloud was a collection of vapours raised beyond the projection of the earth's shadow, and of consequence illuminated by means of the sun. This, however, can by no means be credited; and it is much more probable that this cloud owed its splendor to electricity, than to the reflection of the solar beams.

In the evenings after sunset, and mornings before sunrise, we often observe the clouds tinged with beautiful colours. They are mostly red; sometimes orange, yellow, or purple; more rarely bluish; and seldom or never green. The reason of this variety of colours, according to Sir Isaac Newton, is the different size of the globules into which the vapours are condensed. This is controverted by Mr Melville, who thinks that the clouds reflect the sun's light precisely as it is transmitted to them through the atmosphere. This reflects the most refrangible rays in the greatest quantity; and therefore ought to transmit the least refrangible ones, red, orange, and yellow to the clouds, which accordingly appear most usually of those colours. In this opinion he was greatly confirmed by observing, when he was in Switzerland, that the snowy summits of the Alps turned more and more reddish after sunset, in the same manner as the clouds; and he imagines, that the semitransparency of the clouds, and the obliquity of their situation, tend to make the colours in them much more rich and copious than those on the tops of snowy mountains.

The motions of the clouds, though sometimes directed by the wind, are not always so, especially when thunder is about to ensue. In this case they seem to move very slowly, and often to be absolutely stationary for some time. The reason of this most probably is, that they are impelled by two opposite streams of air nearly of equal strength; by which means their velocity is greatly retarded. In such cases both the aerial currents seem to ascend to a very considerable height; for Mess. Charles and Roberts, when endeavouring to avoid a thunder-cloud in one of their aerial voyages, could

Cloud.
8
Height of
the clouds.

* See *Thunder*.

9
Their various
colours
accounted
for.

10
Of the motions
of clouds.

Cloud. could find no alteration in the course of the current, though they ascended to the height of 4000 feet from the surface of the earth. In some cases the motions of the clouds evidently depend on their electricity, independent of any current of air whatever. Thus, in a calm and warm day, we often see small clouds meeting each other in opposite directions, and setting out from such short distances, that we cannot suppose any opposite winds to be the cause. These clouds, when they meet, instead of forming a larger one, become much less, and sometimes vanish altogether; a circumstance undoubtedly owing to the discharge of opposite electricities into each other. This serves also to throw some light on the true cause of the formation of clouds; for if two clouds electrified, the one positively and the other negatively, destroy each other in contact; it follows, that any quantity of vapour suspended in the atmosphere, while it retains its natural quantity of electricity, remains invisible, but becomes a cloud when electrified either *plus* or *minus*. A difficulty, however, still occurs; viz. in what manner a small quantity of vapour surrounded by an immense ocean of the same kind of matter, can acquire either more or less electricity than that which surrounds it; and this indeed we seem not as yet to have any data to solve in a satisfactory manner.

11
Their shapes.

The shapes of the clouds are likewise undoubtedly owing to their electricity; for in those seasons in which a great commotion has been excited in the atmospheric electricity, we shall perceive the clouds assuming strange and whimsical shapes, which vary almost every moment. This, as well as the meeting of small clouds in the air, and vanishing upon contact, is an almost infallible sign of thunder.

12
Connection of the clouds with wind.

Besides the phenomena of thunder, rain, &c. the clouds are intimately connected with those of wind, and always assume a particular shape, when a strong continued wind is about to ensue; though it is remarkable, that in the strongest winds we shall often observe them stationary. Sometimes also, on the approach of a cloud, we shall find a sudden and violent gust of wind arise; and at others, the wind, though violent before, shall cease on the approach of a cloud, and recover its strength as soon as the cloud is past. This connexion of the clouds with wind is most remarkable in mountainous countries, when the peaks are sufficiently high to have their tops involved in clouds. A very remarkable mountain of this kind is met with at the Cape of Good Hope, from the clouds on whose top, according to the relations of travellers, the winds issue forth as if they had been confined in a bag; and something similar has been observed of mountains in other parts of the world.

13
Their uses.

The uses of the clouds are evident; as from them proceeds the rain which refreshes the earth; and without which, according to the present system of nature, the whole surface of the earth must be a mere desert. They are likewise of great use as a screen interposed between the earth and the scorching rays of the sun, which are often so powerful as to destroy the grafs and other tender vegetables. In the more secret operations of nature also, where the electrical fluid is concerned, the clouds bear a principal share; and serve especially as a medium for conveying that fluid from the atmosphere into the earth, and from the earth into the at-

mosphere; in doing which, when electrified to a great degree, they sometimes produce very terrible effects; of which instances have been already given.

CLOVE-TREE. See CARYOPHYLLUS, BOTANY Index.

CLOVE, a term used in weights of wool. Seven pounds make a clove. In Essex, eight pounds of cheese and butter go to the clove.

CLOVE July-flower. See DIANTHUS, BOTANY Index.

CLOVER GRASS. See TRIFOLIUM, BOTANY Index, and AGRICULTURE Index.

CLOUGH, or DRAUGHT, in commerce, an allowance of two pounds in every hundred weight for the turn of the scale, that the commodity may hold out weight when sold out by retail.

CLOVIO, GIORGIO GIULIO, history and portrait painter, was born in Slavonia, in 1498. Having in the early part of his youth applied himself to literature, his genius prompted him to pursue the art of painting for a profession; and at 18 years of age he went to Rome, where he spent three years to perfect his hand in drawing, and devoted himself entirely to painting in miniature. His knowledge of colouring was established by the instructions of Julio Romano, and his taste of composition and design was founded on the observations he made on the works of Michael Angelo Buonaroti. By those assistances he arrived at such a degree of excellence in portrait as well as in history, that in the former he was accounted equal to Titian, and in the latter not inferior to Buonaroti. He died in 1578. His works are exceedingly valuable, and are at this day numbered among the curiosities of Rome. Vafari, who had seen the wonderful performances of Clovio, with inexpressible astonishment, enumerates many of his portraits and historical compositions, and seems to be almost at a loss for language sufficiently expressive of their merit. He mentions two or three pictures on which the artist had bestowed the labour of nine years; but the principal picture represented Nimrod, building the Tower of Babel; which was so exquisitely finished, and so perfect in all its parts, that it seemed quite inconceivable how the eye or the pencil could execute it. He says it is impossible to imagine any thing so admirably curious; whether one considers the elegance of the attitudes, the richness of the composition, the delicacy of the naked figures, the perspective proportion of the objects, the tender distances, the scenery, the buildings, or other ornaments; for every part is beautiful and inimitable. He also takes notice of a single ant introduced in one of the pictures of this master; which, though exceedingly and incredibly small, is yet so perfect, that even the most minute member was as distinct as if it had been painted of the natural size.

CLOVIS I. was the real founder of the French monarchy; for he was the first conqueror of the several provinces of Gaul, possessed before his time by the Romans, Germans, and Goths. These he united to the then scanty dominions of France, removed the seat of government from Soissons to Paris, and made this the capital of his new kingdom. He died in 511, in the 46th year of his age and 31st of his reign. See (*Hist. of*) FRANCE.

CLOUTS, in Gunnery, are thin plates of iron nailed

Clove-tree
||
Clouts.

Cloyne
||
Cluny.

ed on that part of the axle-tree of a gun-carriage which comes through the nave, and through which the linpin goes.

CLOYNE, a town of Ireland, in the county of Cork and province of Munster. W. Long. 8. 0. N. Lat. 51. 40. It is but a small place, though an episcopal residence. A church was built, and a bishopric erected here, by St Colman, who died on the 4th of November 604; and in 707 an abbey was also founded here. In 1430, the bishopric was united to that of Cork; and the union continued till the 11th of November 1638, when Dr George Synge was consecrated bishop of Cloyne; since which time this see has been governed by its own prelates, one of whom was the celebrated Berkeley. This see is not taxed in the king's books; but is now reputed to be worth 2500l. a-year. The chapter of Cloyne is composed of a dean, chanter, chancellor, treasurer, an archdeacon, and fourteen prebendaries. The diocese is divided into four rural deaneries, and the collegiate church of St Mary of Youghal is united to the bishopric. The cathedral is a decent Gothic building. The nave is about 120 feet long; having lateral aisles, besides the cross aisles, divided by Gothic arches, five on each side. In the choir there is an excellent organ. The bishop's palace, which was rebuilt at the beginning of the present century, is large and convenient. To the north-west of Cloyne is a reputed holy well, dedicated to St Colman, which is much frequented on the 24th of November, being the patron day.

CLUE OF A SAIL, the lower corner; and hence

CLUE-Garnets, are a sort of tackles fastened to the clues, or lower corners of the mainsail or foresail, to truss them up to the yard as occasion requires, which is usually termed *clueing up the sails*.

CLUE-Lines are for the same purpose as clue-garnets; only that the latter are confined to the courses, whereas the former are common to all the square sails. See these ropes as represented in the article SHIP.

CLUNIA, in *Ancient Geography*, a principal town of the Hither Spain, a Roman colony, with a conventus juridicus, on the Durius, to the west of Numantia. Now *Corunna del Conde*.

CLUNIUM, in *Ancient Geography*, a town of Corsica, near Bastia. Now *St Catharine*.

CLUNY, or **CLUGNY**, a celebrated abbey of Benedictine monks, in a city of that name; being the head or chief of a congregation denominated from them.

It is situated in the Maçonnois, a little province of France, on the river Grône; and was founded by William duke of Berry and Aquitain; or, as others say, by the abbot Bernon, supported by that duke, in the year 910.

This abbey was anciently so very spacious and magnificent, that in 1245, after the holding of the first council of Lyons, Pope Innocent IV. went to Cluny, accompanied with the two patriarchs of Antioch and Constantinople, 12 cardinals, 3 archbishops, 15 bishops, and a great number of abbots; who were all entertained, without one of the monks being put out of their place; though S. Louis, Q. Blanche his mother, the duke of Artois his brother, and his sister, the emperor of Constantinople, the sons of the kings of Arragon and Castile, the duke of Burgundy, six counts,

and a great number of lords, with all their retinues, were there at the same time.

Cluny, at its first erection, was put under the immediate protection of the apostolic see, with express prohibition to all secular and ecclesiastic powers, to disturb the monks in the possessions of their effects, or the election of their abbot. By this they pretended to be exempted from the jurisdiction of bishops; which at length gave the hint to other abbeys to insist on the same.

Cluny is the head of a very numerous and extensive congregation: in effect, it was the first congregation of divers monasteries united under one chief, so as only to constitute one body, or, as they call it, one order, that ever arose.

This order of monks was brought into England by William earl of Warren, son-in-law to William the Conqueror, who built a house for them at Lewes in Suffex about the year 1077. There were 27 priories and fells of this order in England, which were governed by foreigners, afterwards made denizens.

CLUPEA, or **HERRING**, in *Ichthyology*, a genus belonging to the order of abdominales. The upper jaw is furnished with a serrated mystache; the branchiostege membrane has eight rays; a scaly serrated line runs along the belly from the head to the tail; and the belly-fins have frequently nine rays. There are 11 species, viz.

1. The harengus, or common herring, has no spots, and the under jaw is longer than the upper one. A herring dies immediately after it is taken out of the water; whence the proverb arises, *As dead as a herring*. The meat is everywhere in great esteem, being fat, soft, and delicate; especially if it is dressed as soon as caught, for then it is incomparably better than on the next day.

The herring was unknown to the ancients. Notwithstanding the words *χαλκίς* and *μαίτις* are by translators rendered *halec*, the characters given to those fish are common to such numbers of different species as render it impossible to say which they intended.

Herrings are found from the highest northern latitudes yet known, as low as the northern coasts of France; and except one instance, brought by Dod, of a few being once taken in the bay of Tangier, none are ever found more southerly. They are met with in vast shoals on the coast of America, as low as Carolina. In Chesapeak-bay is an annual inundation of those fish, which cover the shore in such quantities as to become a nuisance. We find them again in the seas of Kamtschatka, and probably they reach Japan; for Kempfer mentions, in his account of the fish of that country, some that are congenerous. The great winter rendezvous of the herring is within the arctic circle: there they continue for many months in order to recruit themselves after the fatigue of spawning; the seas within that space swarming with insect food in a far greater degree than those of our warmer latitudes.

This mighty army begins to put itself in motion in the spring: we distinguish this vast body by that name; for the word *berring* comes from the German *beer*, "an army," to express their numbers. They begin to appear off the Shetland isles in April and May; these are only the forerunners of the grand shoal which comes

Clupea.

1
Herrings, where found.

2
Immense shoals of them.

Clupea.

comes in June; and their appearance is marked by certain signs, by the numbers of birds, such as gannets and others, which follow to prey on them; but when the main body approaches, its breadth and depth is such as to alter the appearance of the very ocean. It is divided into distinct columns of five or six miles in length, and three or four in breadth, and they drive the water before them with a kind of rippling: sometimes they sink for the space of ten or fifteen minutes, and then rise again to the surface; and in fine weather reflect a variety of splendid colours like a field of the most precious gems; in which, or rather in a much more valuable, light should this stupendous gift of Providence be considered by the inhabitants of the British isles.

The first check this army meets in its march southward is from the Shetland isles, which divide it into two parts; one wing takes to the east, the other to the western shores of Great Britain, and fill every bay and creek with their numbers; others pass on towards Yarmouth, the great and ancient mart of herrings: they then pass through the British Channel, and after that, in a manner disappear. Those which take towards the west, after offering themselves to the Hebrides, where the great stationary fishery is, proceed to the north of Ireland, where they meet with a second interruption, and are obliged to make a second division: the one takes to the western side, and is scarce perceived, being soon lost in the immensity of the Atlantic; but the other, that passes into the Irish sea, rejoices and feeds the inhabitants of most of the coasts that border on it. These brigades, as we may call them, which are thus separated from the greater columns, are often capricious in their motions, and do not show an invariable attachment to their haunts.

3
Wonderful
instinct of
these crea-
tures.

Were we inclined to consider this partial migration in a moral light, we might reflect with veneration and awe on the mighty power which originally impressed on this most useful body of his creatures the instinct that directs and points out the course, that blesses and enriches these islands, which causes them at certain and invariable times, to quit the vast polar deeps, and offer themselves to our expecting fleets. That benevolent Being has never been known from the earliest account of time, once to withdraw this blessing from the whole; though he often thinks proper to deny it to particulars, yet this partial failure (for which we see no natural reason) should fill us with the most exalted and grateful sense of his Providence for impressing such an invariable and general instinct on these fish towards a southward migration when the whole is to be benefited, and to withdraw it when only a minute part is to suffer.

This instinct was given them, that they might remove for the sake of depositing their spawn in warmer seas, that would mature and vivify it more assuredly than those of the frozen zone. It is not from defect of food that they fet themselves in motion; for they come to us full of fat, and on their return are almost universally observed to be lean and miserable. What their food is near the pole we are not yet informed; but in our seas they feed much on the *oniscus marinus*, a crustaceous insect, and sometimes on their own fry.

They are full of roe in the end of June, and continue in perfection till the beginning of winter, when

they deposit their spawn. The young herrings begin to approach the shores in July and August, and are then from half an inch to two inches long: those in Yorkshire are called *herring file*. Though we have no particular authority for it, yet as very few young herrings are found in our seas during winter, it seems most certain that they must return to their parental haunts beneath the ice, to repair the vast destruction of their race during summer by men, fowl, and fish. Some of the old herrings continue on our coast the whole year: the Scarborough fishermen never put down their nets but they catch a few; but the numbers that remain are not worth comparison with those that return. See *Herring Fishery*.

Clupea.
4
Young ones
probably
retire with
their pa-
rents.

The Dutch are most extravagantly fond of this fish when it is pickled. A premium is given to the first bus that arrives in Holland with a lading of this their ambrosia, and a vast price given for each keg. There is as much joy among the inhabitants on its arrival, as the Egyptians show on the first overflowing of the Nile. Flanders had the honour of inventing the art of pickling herrings. One William Beauklen of Beverlét, near Sluys, hit on this useful expedient: from him was derived the name *pickle*, which we borrow from the Dutch and German. Beauklen died in 1397. The emperor Charles V. held his memory in such veneration for the service he did to mankind, as to do his tomb the honour of a visit. It is very singular that most nations give the name of their favourite dish to the facetious attendant on every mountebank. Thus, the Dutch call him *pickle herring*; the Italians, *macaroni*; the French, *jean poitage*; the Germans, *bans wurst*, that is, *jack sausage*; and the English dignify him with the name of *jack pudding*.

5
Pickling of
herrings,
when in-
vented.

2. The *sprattus* has 13 rays in the back fin. It is a native of the European seas, and has a great resemblance to the herring, only it is of a less size. They come into the river Thames below bridge in the beginning of November, and leave it in March; and are, during that season, a great relief to the poor of the capital. At Gravesend and at Yarmouth they are cured like red-herrings; they are sometimes pickled, and are little inferior in flavour to the anchovy, but the bones will not dissolve like those of the latter.

6
Sprattus,
where
found.

3. The *alosa*, or *shad*, has a forked snout, and black spots on the sides. According to Belonius and Hafselquist, this is a fish of passage in the Nile. The last says, it is found in the Mediterranean near Smyrna, and on the coast of Egypt near Rosetta; and that in the months of December and January it ascends the Nile as high as Cairo, where the people stuff it with pot marjoram; and when dressed in that manner, it will very nearly intoxicate the eater. In Great Britain the Severn affords this fish in higher perfection than any other river. It makes its first appearance there in May, but in very warm seasons in April; for its arrival sooner or later depends much on the temper of the air. It continues in the river about two months, and then is succeeded by a variety which we shall have occasion to mention hereafter.

7
Alosa, or
shad, where
found.

The Severn shad is esteemed a very delicate fish about the time of its first appearance, especially in that part of the river that flows by Gloucester, where they are taken in nets, and usually sell dearer than salmon: some are sent to London, where the fishmongers distinguish

8
The finest
inhabit the
Severn.

Clupea
||
Clusium.

istinguish them from those of the Thames by the French name *alose*. Whether they spawn in this river and the Wye is not determined, for their fry has not yet been discovered. The old fish come from the sea into the river in full roe. In the months of July and August, multitudes of bleak frequent the river near Gloucester; some of them are as big as a small herring, and these the fishermen erroneously suppose to be the fry of the shad. Numbers of these are taken near Gloucester, in those months only, but none of the emaciated shad are ever caught in their return.

The Thames shad does not frequent that river till the latter end of May or beginning of June, and is esteemed a very coarse and insipid sort of fish. The Severn shad is sometimes caught in the Thames, though rarely, and called *allis* (no doubt *alose*, the French name) by the fishermen in that river. About the same time, and rather earlier, the variety called, near Gloucester, the *twaitte*, makes its appearance, is taken in great numbers in the Severn, and is held in as great disrepute as the shad of the Thames. The differences between each variety are as follow: the true shad weighs sometimes eight pounds; but their general size is from four to five. The *twaitte*, on the contrary, weighs from half a pound to two pounds, which it never exceeds. The *twaitte* differs from a shad only in having one or more round black spots on the sides; if only one, it is always near the gill; but commonly there are three or four, placed one under the other.

9
Twaitte de-
scribed.

4. The *encrascolus*, or *anchovy*, has its upper jaw longer than the under one, and is about three inches long. They are taken in vast quantities in the Mediterranean, and are brought over here pickled. The great fishery is at Georgia, a small isle west of Leghorn. See *Anchovy-FISHERY*.

10
Anchovy
described.

The other species are, 5. The *atherinoides* has a shining line on each side, and small belly-fins. It is a native of Surinam. 6. The *thrissa* has 28 rays in the fin at the anus. It is found in the Indian ocean. 7. The *simia* has yellow fins, those of the belly being very small. The mouth is flat; the upper jaw is very short; the body is of a shining silver colour, and the fins are yellow. It is a native of Asia. 8. The *sternicla* has no belly-fins, and the body is broad. It is a native of Surinam. 9. The *mystus* is shaped like a sword, and the fins at the anus are united. It is found in the Indian ocean. 10. The *tropica* has a wedge-like tail, and a white, broad, compressed body. It is found at Ascension island. 11. The *sinensis* is very like the common herring, but broader. It has no teeth, and is a native of China.

CLUSIA, the BALSAM-TREE. See *BOTANY Index*.

CLUSINA PALUS, in *Ancient Geography*, a lake of Tuscany, extending north-west between Clusium and Arretium, and communicating with the Arnus and Clanis. Now *Chiana Palude*.

CLUSINI FONTES, (Horace), baths in Tuscany, in the territory of Clusium, between this last to the north, and Acula to the south, at the distance of eight miles from each. Now *Bagni di S. Casciana*.

CLUSIUM, anciently called *Camars*, (Virgil, *Li-vy*); a town of Tuscany, at the south end of the Palus Clusina, where it forms the Clanis; the royal residence of Porfenna, three days journey from Rome to

the north, (Polybius). *Clusinus* the epithet. *Clusini Veteres* the people. Now *Chiusi*. E. Long. 13°, Lat. 43°.—*Clusium Novum*, was a town of Tuscany, near the springs of the Tiber, in the territory of Arretium; where lies the Ager Clusinus; now called *Casertino*. *Clusini Novi*, the people, (Pliny).

CLUTIA. See *BOTANY Index*.

CLUVIER, PHILIP, in Latin *Cluverius*, a celebrated geographer, born at Dantzic in 1580. He travelled into Poland, Germany, and the Netherlands, in order to study law; but, being at Leyden, Joseph Scaliger persuaded him to give way to his genius for geography. Cluvier followed his advice, and for this purposed visited the greatest part of the European states. He was well versed in many languages; and wherever he went, obtained illustrious friends and protectors. At his return to Leyden, he taught there with great applause; and died in 1623, aged 43. He wrote, 1. *De tribus Rbeni alveis*. 2. *Germania antiqua*. 3. *Sicilia antiqua*. 4. *Italia antiqua*. 5. *Introductio in univversam Geographiam*. All justly esteemed.

Clutia
||
Clyde.

CLYDE, a river in Scotland, which, arising in Annandale, falls into the sea over against the isle of Bute. Next to the Tay, it is the largest river in Scotland, and is navigable for small craft up to Glasgow. The canal, which joins the Forth, falls into it a little below that city. The cataract called the *Friith of the Clyde*, opposite to Lanark, is a great natural curiosity, and the first scene of the kind of Great Britain. This tremendous sheet of water for about a mile falls from rock to rock. At Stone-byers, the first fall is about 60 feet; the last, at Cora-Lynn, is over solid rock, not less than 100 feet high. At both these places this great body of water exhibits a grander and more interesting spectacle than imagination can possibly conceive.

At Cora-Lynn, the falls are seen to most advantage from a ruinous pavilion in a garden, placed in a lofty situation. The cataract is full in view, seen over the tops of trees and bushes, precipitating itself, for an amazing way, from rock to rock, with short interruptions, forming a rude slope of furious foam. The sides are bounded by vast rocks, clothed on their tops with trees: on the summit and very verge of one is a ruined tower, and in front a wood overtopped by a verdant hill. A path conducts the traveller down to the beginning of the fall, into which projects a high rock, in floods insulated by the water; and from the top is a tremendous view of the furious stream. In the cliffs of this savage retreat the brave Wallace is said to have concealed himself, meditating revenge for his injured country.

On regaining the top, the walk is formed near the verge of the rocks, which on both sides are perfectly mural and equidistant, except where they overhang: the river is pent up between them at a distance far beneath; not running, but rather sliding along a stony bottom sloping the whole way. The summits of the rock are wooded; the sides smooth and naked; the strata narrow and regular, forming a stupendous natural masonry. After a walk of above half a mile on the edge of this great chasm, on a sudden appears the great and bold fall of Boniton, in a foaming-sheet, far-projecting into a hollow, in which the water shows a violent

Clymenis
||
Clytia.

violent agitation, and a wide extending mist arises from the surface. Above that is a second great fall; two lesser succeed; beyond them the river winds, grows more tranquil, and is seen for a considerable way, bounded on one side by wooded banks, on the other by rich and swelling fields.

The great fall of Stone-byers, first mentioned, has more of the horrible in it than any of the others, and is seen with more difficulty: it consists of two precipitous cataracts falling one above the other into a vast chasm, bounded by lofty rocks, forming an amazing theatre to the view of those who take the pains to descend to the bottom. Between this and Cora-Lynn there is another fall called *Dundoffin*.

CLYMENE, in fabulous history, the daughter of Oceanus, who, being beloved by Apollo, he had by her Phaëton, Lampatia, Egle, and Phebe. See PHAËTON.

CLYPEOLA, TREACLE-MUSTARD. See BOTANY Index.

CLYSSUS, an extract prepared, not from one, but several bodies mixed together; and, among the moderns, the term is applied to several extracts prepared from the same body, and then mixed together.

CLYSTER, is a liquid remedy, to be injected chiefly at the anus into the larger intestines. It is usually administered by the bladder of a hog, sheep, or ox, perforated at each end, and having at one of the apertures an ivory pipe fastened with pack-thread. But the French, and sometimes the Dutch, use a pewter syringe, by which the liquor may be drawn in with more ease and expedition than in the bladder, and likewise more forcibly expelled into the large intestines. This remedy should never be administered either too hot or too cold, but tepid; for either of the former will be injurious to the bowels.

Clysters are sometimes used to nourish and support a patient who can swallow little or no aliment, by reason of some impediment in the organs of deglutition; in which case they may be made of broth, milk, ale, and decoctions of barley and oats with wine. The English introduced a new kind of clyster, made of the smoke of tobacco, which has been used by several other nations, and appears to be of considerable efficacy when other clysters prove ineffectual, and particularly in the iliac passion, in the *hernia incarcerata*, and for the recovery of drowned persons.

CLYTEMNESTRA, in fabulous history, the daughter of Jupiter and Leda. She married Agamemnon; but while that prince was at the siege of Troy, she had an amorous intrigue with Ægisthus, whom she engaged to murder Agamemnon at his return to his dominions. Her son Orestes, however, revenged the death of his father by killing Ægisthus, with his mother Clytemnestra; but was afterwards haunted by the Furies as long as he lived.

CLYTIA, or CLYTIE, daughter of Oceanus and Tethys, beloved by Apollo. She was deserted by her lover, who paid his addresses to Leucothoe; and this so irritated her, that she discovered the whole intrigue to her rival's father. Apollo despised her the more for this; and she pined away, and was changed into a flower, commonly called a *sun-flower*, which still turns its head towards the sun in his course in token of her love.

Vol. VI. Part I.

CNEORUM, WIDOW-WAIL. See BOTANY Index. CNEORUM || Coach.

CNICUS, BLESSED-THISTLE. See BOTANY Index. CNIDUS, in *Ancient Geography*, a Greek town of Caria; situated on a horn or promontory of a peninsula. It had in front a double port, and an island lying before it in form of a theatre, which being joined to the continent by moles or causeways, made *Cnidus* a Dipolis or double town, (Strabo), because a great number of Cnidians inhabited the island. Pausanias mentions a bridge which joined the island to the continent.—*Cnidii*, the people. *Cnidius*, the epithet.—*Cnidia Venus*, a principal divinity of the Cnidians, (Horace). Her statue was executed by Praxiteles; and so exquisitely done, and so much admired, that people came from all parts to view it (Pliny). Of this place was Eudoxus, the famous astronomer and geometer, who had there an observatory (Strabo).

CNOSSUS, or CNOsus, anciently called *Ceratos*, from a cognominal river running by it; a city of Crete, 23 miles to the east of Gortina (Peutinger). Here stood the sepulchre of Jupiter, the famous labyrinth, and the palace of Minos, a very ancient king; here happened the adventure of Ariadne his daughter with Theseus, called *Gnosis* (Ovid). Its port-town was Heracleum, on the east side of the island.

COACH, a vehicle for commodious travelling, suspended on leathers, and moved on wheels. In Britain, and throughout Europe, the coaches are drawn by horses, except in Spain, where they use mules. In a part of the east, especially the dominions of the great Mogul, their coaches are drawn by oxen. In Denmark they sometimes yoke rein-deer in their coaches; though rather for curiosity than use. The coachman is ordinarily placed on a seat raised before the body of the coach. But the Spanish policy has displaced him in that country by a royal ordonnance; on occasion of the Duke d'Olivares, who found that a very important secret, whereon he had conferred in his coach, had been overheard and revealed by his coachman: since that time the place of the Spanish coachman is the same with that of the French stage-coachman and our postilion, viz. on the first horse on the left.

According to Professor Beckmann, coaches of some kind were known about the beginning of the 16th century; but the use of them was limited to women of the highest rank. It was accounted disgraceful in men to ride in them. It appears from the history of that period, that the electors and princes of the empire, when they did not choose to attend the meetings of the states, excused themselves to the emperor, by informing him, that their health would not permit them to travel on horseback; and it was considered unbecoming to ride in carriages like women. But it seems also pretty certain, that about the end of the 15th century, the emperor, kings, and some princes, travelled in covered carriages, and also employed them on public solemnities.

The nuptial carriage of the first wife of Leopold, a Spanish princess, cost, including the harness, 38,000 florins. The coaches used by that emperor are thus described. In the imperial coaches no great magnificence was to be seen, being covered over with red cloth and black nails. The harness was black, and no gold was to be seen in the whole work. They had glass pannels, for which reason they were called *imperial*

E e rial

Coach. *rial coaches.* The harness was ornamented with fringes of red silk on days of festivity. The imperial coaches were only distinguished by having leather traces, while the ladies in the emperor's suite were contented with traces made of ropes. Fifty gilt coaches having six horses each, were to be seen in 1681 at the court of Ernest Augustus of Hanover. The first time that plenipotentiaries appeared in coaches, was at the imperial commission in 1613 held at Erfurth.

We meet with ample proof in the history of France, that the monarchs rode on horses, the servants on mules, and ladies of distinction sometimes on asses, at Paris, in the 14th, 15th, and even 16th centuries. Yet carriages of some kind seem to have been used in France at an early period, since there is still preserved a statute of Philip the Fair, issued in 1294, for the suppression of luxury, and in which the wives of citizens were prohibited the use of carriages.

The oldest coaches used by the ladies of England were denominated *whirlcotes*, a name now sunk in oblivion. About the end of the 14th century, when Richard II. was forced to fly before his rebellious subjects, he and all his attendants travelled on horseback, his mother alone riding in a coach, as she was indisposed. This became afterwards unfashionable, the daughter of Charles IV. having showed the ladies of England how conveniently she could ride on a side-saddle.

According to Stow, coaches first came to be used in England about the middle of the 16th century, having been introduced from Germany by the earl of Arundel. The English plenipotentiary came to Scotland in a coach in the year 1598, and they were generally used about the year 1605.

Authors observe, as a thing very singular, that there were at first no more than three coaches in Paris; the one that of the queen; the second that of Diana mistress of Henry II.; and the third belonged to Jean de Lava de Bois Dauphin; whose enormous bulk disabled him from travelling on horseback. One may hence judge how much vanity, luxury, and idleness, have grown upon our hands in later days; there being now computed in that same city no less than 15,000 coaches.

Coaches have had the fate of all other inventions, to be brought by degrees to their perfection; at present they seem to want nothing, either with regard to ease or magnificence. Louis XIV. of France made several sumptuary laws for restraining the excessive richness of coaches, prohibiting the use of gold, silver, &c. therein; but they have had the fate to be neglected.

The following are the duties payable on carriages of this description in Britain (1804).

For one carriage, with four wheels, the annual sum of	L. 10	0	0
For two	11	0	0
three	12	0	0
four	12	10	0
five	13	0	0
fix	13	10	0
seven	14	0	0
eight	14	10	0
nine and upwards,	15	0	0

And for every additional body successively used on the same carriage or number of wheels, the further sum of	L. 5	0	0
For carriages with less than four wheels, drawn by one horse	5	5	0
For carriages drawn by two or more horses	7	7	0
For every additional body	2	10	0
For carriages with four wheels let out to hire	8	8	0

Coach.

Every maker of coaches, chaises, chariots, &c. must, from and after the 5th day of July 1785, take out at the excise office in London, or of their agents in the country, a license, to be renewed annually at least ten days before the expiration of the former, for which they must pay 20s. They must also pay 20s. duty for every four-wheeled carriage newly built for sale, and 10s. for every two-wheeled carriage. These duties are also payable to the commissioners of the excise in town, or their agents in the country.

Coach-makers in Scotland are to take out their licenses and pay the duties to the commissioners of excise in Edinburgh, or their agents in the country of that part of Great Britain.

Every coach-maker neglecting to take out a license, and renewing the same annually, forfeits 10l.; and neglecting or refusing to settle every six weeks, in the manner particularly directed by the act, is a forfeiture of 20l.

Hackney-Coaches, those exposed to hire, in the streets of London, and some other great cities, at rates fixed by authority.

One thousand hackney-coaches are allowed in London and Westminster: which are to be licensed by commissioners, and to pay a duty to the crown. They are all numbered, having their numbers engraved on tin plates fixed on the coach-doors. Their fares or rates are fixed by act of parliament; and by a late act have been increased in consequence of a new weekly tax.

Stage-Coaches are those appointed for the conveyance of travellers from one city or town to another. The masters of stage-coaches are not liable to an action for things lost by their coachmen, who have money given them to carry the goods, unless where such master takes a price for the same.

Persons keeping any coach, berlin, landau, or other carriage with four wheels, or any calash, chaise, chair, or other carriage with two wheels, to be employed as public stage-coaches or carriages, for the purpose of conveying passengers for hire to and from different places, shall pay annually 5s. for a license; and no person so licensed shall by virtue of one license keep more than one carriage, under the penalty of 10l.

Mail-Coaches are stage-coaches of a particular construction to prevent overturns; and for a certain consideration carry his majesty's mails, which are protected by a guard, and subject to the regulations of the post-office. They are punctual as to their time of arrival and departure, are restricted to four inside passengers, and from experience have proved very beneficial to the commerce and correspondence of this country. The late John Palmer, Esq. who had the merit of the invention, and was indefatigable in bringing the establishment to a permanent footing, was greatly patronized

Coach
||
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tronized by government; and got, as the reward of his service, a handsome appointment in the general post-office London.

СОАЩ, or СОВЩ, is also a sort of chamber or apartment in a large ship of war near the stern. The floor of it is formed by the utmost part of the quarter-deck, and the roof of it by the poop: it is generally the habitation of the captain.

COADUNATE, in *Botany*, an order of plants in the *fragmenta methodi naturalis* of Linnæus, in which he has these genera, viz. annona, liriodendrum, magnolia, uvaria, michelia, thea.

COAGULATION, in *Chemistry*, is performed by six different agents; and by each of these in several different manners. 1. It is performed with water, by congealing, crystallizing, and precipitating, as in the mercurius vitæ and some other preparations. 2. With oil, which, by the force of fire, unites with sulphur, salts, and metals. 3. With alcohol, upon the spirit of sal ammoniac, the white of eggs, the serum of the blood, &c. 4. With acid and alkali growing solid together, as in the tartarum vitriolatum. 5. With fixed alkali, as in milk. And, 6. With acid salts; as in milk, serum, and the whites of eggs.

COAGULUM, is the same with what in English we call *runnet*, or rather the curd formed thereby.

COAKS. For the exciting of intense heats, as for the smelting of iron ore, and for operations where the acid and oily particles would be detrimental, as the drying of malt, fossil-coals are previously charred, or reduced to *coaks*; that is, they are made to undergo an operation similar to that by which charcoal is made. By this operation coals are deprived of their phlegm, their acid liquor, and part of their fluid oil. Coaks, therefore, consist of the two most fixed constituent parts, the heavy oil and the earth, together with the acid concrete salt, which, though volatile, is dissolved by the oil and the earth.

COAL, among chemists, signifies any substance containing oil, which has been exposed to the fire in close vessels, so that all its volatile principles are expelled, and that it can sustain a red heat without further decomposition. Coal is commonly solid, black, very dry, and considerably hard. The specific character of perfect coal is its capacity of burning with access of air, while it becomes red-hot and sparkles, sometimes with a sensible flame which gives little light, with no smoke or soot capable of blackening white bodies.

Coal is capable of communicating its inflammable principle, either to the sulphuric acid, with which it forms sulphur; or to the nitrous acid contained in nitre, which it inflames; or to metallic earths, which it reduces into metals. But the phlogiston cannot pass from coal to form these new combinations without the assistance of red-heat. Coal seems to be an unalterable compound in every instance but those mentioned, of burning in the open air, and of communicating its phlogiston to other bodies: for it may be exposed in close vessels to the most violent and long-continued fire without suffering the least decomposition. No disposition to fuse, nor any diminution of weight, can be perceived. It is a substance exceedingly fixed, and perhaps the most refractory in nature. It resists the action of the most powerful menstrua, liver of sulphur alone

excepted. Coal is evidently a result of the decomposition of the compound bodies from which it is obtained. It consists of the greatest part of the earthy principle of these compound bodies, with which a part of the saline principles, and some of the phlogiston of the decomposed oil, are fixed and combined very intimately. Coal can never be formed but by the phlogiston of a body which has been in an oily state; hence it cannot be formed by sulphur, phosphorus, metals, nor by any other substance the phlogiston of which is not in an oily state. Also every oily matter treated with fire in close vessels, furnishes true coal; so that whenever a charry residuum is left, we may be certain that the substance employed in the operation contained oil. Lastly, the inflammable principle of coal although it proceeds from oil, certainly is not oil, but pure phlogiston, since coal added to sulphuric acid can form sulphur, to phosphoric acid can form phosphorus, &c. and since oil can produce none of these effects till it has been decomposed and reduced to the state of coal. Besides, the phenomena accompanying the burning of coal are different from those which happen when oily substances are burnt. The flame of charcoal is not so bright as that of oil, and produces no flame or soot.

All the phlogiston of coal is not burnt in the open air, particularly when the combustion is slow. One part of it exhales without decomposition, and forms a vapour, or an invisible and insensible gas. This vapour (which is, or at least contains a great deal of fixed air) is found to be very pernicious, and to affect the animal system in such a manner as to occasion death in a very short time. For this reason it is dangerous to remain in a close place, where charcoal or any other sort of coal is burnt. Persons struck by this vapour are stunned, faint, suffer a violent headach, and fall down senseless and motionless. The best method of recovering them is by exposure to the open air, and by making them swallow vinegar, and breathe its steam.

Amongst coals, some differences are observable, which proceed from the difference of the bodies from which they are made: some coals, particularly, are more combustible than others. This combustibility seems to depend on the greater or less quantity of saline principle they contain; that is, the more of the saline principle it contains, the more easily it decomposes and burns. For example, coals made of plants and wood containing much saline matter capable of fixing it, the ashes of which contain much alkaline salt, burn vigorously and produce much heat; whereas the coals of animal matters, the saline principles of which are volatile, and cannot be fixed but in small quantity, and the ashes of which contain little or no salt, are scarcely at all combustible. For they not only do not kindle so easily as charcoal does, nor even burn alone, but they cannot be reduced to ashes, without very great trouble, even when the most effectual methods are used to facilitate the combustion. The coal of bullocks blood has been kept for six hours very red in a shallow crucible, surrounded by burning charcoal, and constantly stirred all the time, that it might be totally exposed to the air; yet could it not be reduced to white, or even gray, ashes: It still remained very black, and full of phlogiston. The coals of pure oils, or of concrete

Coal.

oily substances and soot, which is a kind of coal raised during inflammation, are as difficultly reduced to ashes as animal coals. These coals contain very little saline matter, and their ashes yield no alkali. The coals which are so difficultly burnt, are also less capable of inflaming with nitre than others more combustible; and some of them even in a great measure resist the action of nitre.

COAL, in *Mineralogy*, a kind of solid inflammable substance, supposed to be of a bituminous nature, and commonly used for fuel. Of this substance there are various species.

1. *Pit coal* (*Lithanthrax*), is a black, solid, compact, brittle mass, of moderate hardness, lamellated structure, more or less shining, but seldom capable of a good polish; and does not melt when heated. According to Kirwan, it consists of petrol or asphaltum, intimately mixed with a small portion of earth chiefly argillaceous; seldom calcareous; and frequently mixed with pyrites. A red tincture is extracted from it by spirit of wine, but caustic alkali attacks the bituminous part. From some sorts of it a varnish may be made by means of fat oils. Fixed alkali has never been found in any kind of it, nor sulphur, unless when it happens to be mixed with pyrites.—None of the various kinds are found to be electric *per se* (A).

The varieties of lithanthrax, enumerated by Cronstedt, are, 1. With a small quantity of argillaceous earth and sulphuric acid. It is of a black colour, and shining texture: it burns, and is mostly consumed in the fire, but leaves, however, a small quantity of ashes.

2. *Slaty coal*.
2. *Culm coal*, called *kolm*, by the Swedes, has a greater portion of argillaceous earth and sulphuric acid, with a moderate proportion of petrol. It has the same appearance with the foregoing, though its texture is more dull: it burns with a flame without being consumed, but leaves behind it a slag of the same bulk with the original volume of the coal. The following is Mr Kirwan's description of it, from the memoirs of the Stockholm academy. "Its fracture has a rougher section than the cannel coal; its specific gravity from 1.300 to 1.370. The best kind affords by distillation, at first fixed air, then an acid liquor, afterwards inflammable air, and a light oil of the nature of petrol; then a volatile alkali; and lastly pitch-

oil. The residuum is nearly three quarters of the whole; and being slowly burnt, affords 13 per cent. of ashes, which consist mostly of argillaceous earth; and about three hundredth parts of them are magnetic. It is found in England, and among some aluminous ores in Sweden."

3. *Slate-coal* contains such a quantity of argillaceous earth, that it looks like common slate; however, it burns by itself with a flame. M. Magellan is of opinion that this is the bituminous substance already described. This schistus is of a dark bluish rusty colour; when thrown on the fire it burns with a lively flame, and almost as readily as the oily wood of dry olive tree, or *lignum vitæ*; emitting the very disagreeable smell of petrol. Such large quarries of it are found near Purbeck in Dorsetshire, that the poorer part of the inhabitants are thence supplied with fuel. From the appearance of this slaty coal, Cronstedt has been induced to suppose that the earth of all kinds of coal is argillaceous, though it is not so easy to distinguish it after being burnt. The pit-coals, he says, contain more or less of the sulphuric acid; for which reason the smoke arising from them attacks silver in the same manner as sulphur does, let the coals be ever so free from marcasite, which, however, is often imbibed or mixed with them.

4. *Cannel coal* (*Ampelites*), is of a dull black colour; breaks easily in all directions; and, if broken transversely, presents a smooth conchoidal surface. It burns with a bright lively flame, but is very apt to fly in pieces in the fire; however, it is said to be entirely deprived of this property by immersion in water for some hours previous to its being used. It contains a considerable quantity of petrol in a less condensed state than other coal. Its specific gravity is about 1.270. This kind of coal, being of an uniform hard texture, is easily turned on a lathe, and takes a good polish. Hence it is used for making various toys, which appear almost as well as if made of the finest jet.

5. *Kilkenny coal* has a specific gravity equal to 1.400. It contains the largest quantity of asphaltum; burns with less smoke and flame, and more intensely, though more slowly, than the cannel-coal. The quantity of earth it contains does not exceed one-twentieth part of its weight; but this kind of coal is frequently mixed with pyrites. It is found in the county of Kilkenny,

(A) "The varieties of this coal (says M. Magellan) are very numerous according to the different substances with which it is mixed; but in regard to their economical uses, only two kinds are taken notice of by the British legislature, viz. culm and caking coals. The caking coals, in burning, show an incipient fusion, so that their smallest pieces unite in the fire into one mass; by which means the smallest pieces, and even the mere dust of this kind, are almost equally valuable with the largest pieces. The other sort called *culm*, does not fuse or unite in the fiercest fire; so that the small coal, being unfit for domestic purposes, can only be used in burning limestone.

"It should be an easy matter for any person to distinguish culm from small caking coal, either by trying to make fire with it in a common grate, without interposing any other fuel between it; when if it kindles, it is a caking coal; if not, it is culm: Or by putting some of these small fragments of coal on an ignited iron shovel; if they melt and run together, they belong to the caking kinds; if not, they are culm. But it seems that coal merchants are now in the custom of calling *culm* the powdery parts of pit-coal, of whatsoever kind they may happen to be. The reason of this is, that there is a difference in the duty payable by culm and by caking coals. There never was any difficulty, however, on the subject; nor would there be any difficulty in collecting the tax, were it not for the insufferable ignorance and love of despotic oppression which generally pervades the underling officers of the revenue."

Coal.

kenny, belonging to the province of Leinster in Ireland. The quality of it as burning without smoke, is proverbially used as an encomium on the county.

6. *Sulphureous coal* consists of the former kinds mixed with a very considerable portion of pyrites; whence it is apt to moulder and break when exposed to the air, after which water will act upon it. It contains yellow spots that look like metal; burns with a sulphureous smell, leaving behind it either slag or sulphureous ashes, or both. Its specific gravity is 1.500 or more.

7. *Bovey coal* (*Xylanthrax*), is of a brown or brownish-black colour, and of a yellow laminar texture. Its laminae are frequently flexible when first dug, though they generally harden when exposed to the air. It consists of wood penetrated with petrol or bitumen, and frequently contains pyrites, alum, and vitriol. According to the German chemists, its ashes contain a little fixed alkali; but Mr Mills differs from them on this subject. By distillation it yields a fetid liquor mixed with a volatile alkali and oil; part of which is soluble in alcohol, and part of a mineral nature, and insoluble. It is found in almost all the countries of Europe.

These are the most considerable varieties of coals commonly known; but we must not imagine, that each of them is to be met homogeneous in those places where they are found. On the contrary, the different qualities and proportions of their ingredients make a vast number of other varieties, fit for different purposes, according to the quality and quantity of those they contain. Thus, various kinds of coals are often found mixed with one another under ground, and some of the finer sorts sometimes run like veins between those of a coarse kind. Thus, M. Magellan observed in the fine coals employed in a curious manufactory at Birmingham, that they produced a much clearer flame than he had ever observed from common coal; yet, on inquiry, he found that these were picked out from the common coals of the country, through which they ran in veins, and were easily distinguished by the manufacturers, though they did not afford sufficient indications of a specific difference. The purpose to which they were applied was the moulding rods of transparent and coloured glass into the shapes proper for common buttons, which they performed with astonishing expedition.

Fourcroy remarks, that this fossil bitumen, when heated in contact with a body in combustion, and having a free access of air, kindles the more slowly and with the greater difficulty in proportion as it is more weighty and compact. When once kindled, it emits a strong and durable heat, and burns for a long time before it is consumed. The matter that is burned, and produces the flame, appears very dense, and seems united to some other substance which retards its destruction. On burning, it emits a particular strong smell, which is not at all sulphureous when the coal contains no pyrites. When the combustible, oily, and other volatile parts of the coal are dissipated, if the combustion be then stopped, the remainder is found to be reduced to a true charred slate, and is called *coak*. This substance is capable of exciting the most intense heat, for which purpose it is used in metallurgic works all over Britain.

Coal,
Coal-
Mine.

“It is well known (says M. Magellan,) that the English method of burning pit coal into *coak* has been a most profitable and happy acquisition for the smelting our ores, and for many other metallurgical and chemical processes in this island. But the ingenious and advantageous undertaking of Lord Dundonald, by which he turns to a very considerable profit the mines of coals in his and other estates, building ovens of a proper construction for burning pit coal into coak, and at the same time for collecting, in separate receptacles, the volatile alkali, oil, tar, and pitch, which were generally lost by the usual method, deserves to be noticed, as it affords a very remarkable instance of the great losses to mankind, for want of carefully attending to every result from great processes of art when made on a large scale. These ovens are so contrived, as to admit an under supply of air; and the coals, after being kindled, decompose themselves by a slow but incomplete combustion, which does not destroy the ingredients. The residuum left in the oven proves to be most excellent cinders or coaks; whilst the volatile parts, which otherwise would be dissipated in the air, are separated and condensed in reservoirs, or receptacles of capacious size, placed at proper distances beyond the reach of fire. Moul. Faujas de St Fond, who visited these works in a journey he made to Scotland, undertook to erect a similar kind of oven in France; and it is rather singular, that he endeavours to establish a claim of having discovered the same processes before he saw them in Scotland, as if it did not reflect a greater honour on his industry, to carry back to his country some useful knowledge, than to return as ignorant as our English travellers,” &c.

On subjecting pit-coal of any kind to distillation in close vessels, it first yields a phlegm or watery liquor, then an ethereal or volatile oil, afterwards a volatile alkali, and lastly, a thick and greasy oil; but it is remarkable, that, by rectifying this last oil, a transparent thin and light oil of a straw colour is produced, which being exposed to the air becomes black like animal oils. From this and other observations, the general opinion is, that coals, bitumens, and other oily substances found in the mineral kingdom, derive their origin from vegetables buried in the earth, since it is well known that only organized bodies have the power of producing oily and fat substances. “The amazing irregularities, gaps, and breaks (says M. Magellan) of the strata of coals, and of other fossil substances, evince that this globe has undergone the most violent convulsions, by which its parts have been broken, detached and overturned in different ways, burying large tracts of their upper surfaces, with all the animal and vegetable productions there existing, at the time of those horrible catastrophes, whose epoch far precedes all human records. And it is easy to be conceived, that the various heaps and congeries of these vegetable and animal substances, remaining for ages and ages in the bowels of the earth, have obtained various consistencies, and still produce those oily and bituminous juices, which find way to gush out, leaving behind their thickest parts on the same places where they are found, and in many others where the industry of mankind never will be able to penetrate.”

Coal-Mine. See COALERY. Maliciously setting fire to coal-mines is felony, by stat. 10 Geo. II. c. 32. § 6.

Small

Coal,
Coalery.

Small Coal, a sort of charcoal prepared from the spray and brushwood stripped off from the branches of cop-pice wood, sometimes bound in bairns for that purpose, and sometimes charred without binding, in which case it is called "coming it together."

I
History of
coals.* See *Am-
pelites*.† L. xxxvi.
cap. 26.
Augustus
placed the
statues of
four ele-
phants
made of it
in the tem-
ple of Con-
cord.*Whittaker's
History of
Manchester.*† i. e. "the
place of
tents." An
ancient Bri-
tish town,
the site of
which was
the present
Castlefield
at Manche-
ster.

COALERY, COALIERY, or COLLIERY; a coal-work, or place where COALS are dug.

It is generally agreed, that our cannel-coal * is the lapis ampelites of the Romans, though it seems to have been used by them only for making toys, bracelets, &c. But of that common fuel which we denomi-*nate coals*, the native Romans were entirely ignorant. It is certain that they are not, as some have imagined, the lapis obsidianus of Pliny, about which there have been great disputes †: nor the GAGATES, or JET, which others, again, have taken for the *lapis obsidianus*; though the lightness and texture show plainly that it is not either stone or coal. In fact, there are no beds of it in the compass of Italy. The great line of that fuel seems to sweep away round the globe, from north-east to south-west; not ranging at a distance even from the south-easterly parts of our island as is generally imagined, but actually visiting Brabant and France, and yet avoiding Italy.

But the primæval Britons appear to have used it. And in the precincts of Manchester particularly, which are furnished with an inexhaustible abundance of it, they could not have remained unapprised of the agree-able combustible around them. The currents there frequently bring down fragments of coal from the mountains; and in the long and winding course of them through the parish, the Britons would soon mark the shining stones in the channels; and by the aid of accident, or the force of reflection, find out the utility of them. But we can advance still nearer to a certainty. Several pieces of coal were discovered some years ago in the sand under the Roman way to Ribchester, when both were dug up at the construction of a house in Quay-street. The number of pieces, several of them as large as eggs, was not less than 40; and a quantity of slack was dug up with them. These circumstances show the coals to have been lodged upon the spot, before the road of the Romans covered it. That ground being in the neighbourhood of *Mance-
nion* †, the Britons had there repositied a quantity of coals, probably for the use of the garrison; and many of the smaller fragments, and some of the slack, were buried in the sand upon which they were laid. And that the Britons in general were acquainted with this fuel, is evident from its appellation amongst us at present, which is not Saxon, but British; and subsists among the Irish in their *O gual*, and among the Cornish in their *kolan*, to this day.

The extensive beds of fuel, therefore, with which the kingdom of England and the precincts of Manchester are so happily stored, were first noticed by the skill, and first opened by the labour of the Britons; and some time before the arrival of the Romans among us. And the nearer quarries in the confines of Bradford, Newton, and Manchester, would naturally attract the notice, and invite the inquiries of the Britons, before any others. The current of the Medlock, which washes the sides of them, would bring down specimens of the riches within, lodge many of them about the

Castlefield, and allure the Britons successively to a collection of the one and a search after the other.

Coalery.

But, even for ages after the discovery, wood continued to compose the general fuel of the nations. In 852, a grant was made of some lands by the abbey of Peterborough, under the reservation of certain boons and payments in kind to the monastery; as, one night's entertainment; 10 vessels of Welsh and two of common ale; 60 cart-loads of wood, and 12 of pit-coal; where we see the quantity of coal was only one cart-load to five of wood. The latter naturally continued the principal article of our fuel as long as the forests and thickets presented themselves so ready to the hand; and such it continued till a very late period. The first public notice of the former is mentioned by Mr Hume to have been in the time of Henry III. who in the year 1272, granted a charter to the town of Newcastle, giving the inhabitants a license to dig coals; and the first statute relating to this article was the 9 Henry V. c. 10. ordaining all keels in the port of Newcastle to be measured by commissioners, before carriage of coals, on pain of forfeiture. They were not brought into common use till the reign of Charles I.; and were then sold for about 17s. a chaldron. In some years after the restoration, there were about 200,000 chaldrons burnt in London; in 1670, about 270,000 chaldrons; at the revolution, upwards of 300,000 chaldrons; and at present, full 600,000 are annually consumed there. There is, besides, an immense consumption in other parts of Briton, and in Ireland. In Scotland, they supply their own consumption, and also export. In Ireland, though they have coal, yet they take annually to the value of 30,000l. from England, and 12,000l. from Scotland.

The most remarkable coalery, or coal-work, that we have ever had in this island, was that wrought at Bor-rowstounness, under the sea. The veins of coal were found to continue under the bed of the sea in this place, and the colliers had the courage to work the vein near half way over; there being a mote half a mile from the shore, where there was an entry that went down into the coal-pit, under the sea. This was made into a kind of round key or mote, as they call it, built so as to keep out the sea, which flowed there twelve feet. Here the coals were laid, and a ship, of that draught of water, could lay her side to the mote, and take in the coal.—This famous coalery belonged to the earl of Kincardine's family. The fresh water which sprung from the bottom and sides of the coal pit, was always drawn out upon the shore by an engine moved by water, that drew it forty fathoms. This coal-pit continued to be wrought many years to the great profit of the owners, and the wonder of all that saw it; but, at last, an unexpected high tide drowned the whole at once: the labourers had not time to escape, but perished in it.

There are several other countries in Europe which possess considerable coal-mines; as France, Liege, Germany, and Sweden. Also on the other side of the Atlantic ocean, there has been coal discovered, and wrought; in Newfoundland, Cape-Breton, Canada, and some of the New England provinces. But in all these countries, the coal is of a quality much inferior to the British, and entirely unfit to be used in many manufactures;

Excellence
of the Bri-
tish coals.

Coalery.

3
Importance
of the coal-
trade.

manufactures; so that they are obliged to import great quantities from Britain for the use of their manufactures of iron, &c.

Our inland coal-trade, that is, carrying coals from Newcastle, Sunderland, Blith, and other adjacent places in the north of England, as also from the frith of Edinburgh in Scotland, and other places adjacent, to the city of London, and to the port towns on the coast all the way, as well on this side of Newcastle, north, as up the channel as high as Portsmouth west, is a prodigious article, and employs abundance of shipping and seamen; infomuch that, in a time of urgent necessity, the coalery navigation alone has been able to supply the government with a body of seamen for the royal navy, able to man a considerable fleet at a very short warning, and that without difficulty, when no other branch of trade could do the like. Likewise the Whitehaven coaleries in Cumberland, belonging, to Sir James Lowther, furnish several counties in Ireland with coals, and constantly employ upwards of 2000 seamen; which also is a noble nursery for the navy of this kingdom. And not only do the pit-coals sufficiently supply all the ports, but, by means of those ports and the navigable rivers, all the adjacent counties very far inland.

In short, coals, though not an exclusive, yet may, with propriety, be styled a peculiar blessing to Britain, from their great plenty, their acknowledged excellence, and their being found in such places as are conveniently situated for exportation. Nor is there any danger of the export trade being lessened even by the several duties that have been laid upon them; for the foreign consumpt being founded in necessity with regard to manufactures, and in economy where they are used for convenience (wood and turf being dearer than coals with the duty), we need be in no fear of the markets declining. There is as little room to be alarmed from an apprehension of their being exhausted, as the present works are capable of supplying us for a long series of years, and there are many other mines ready to be opened when these shall fail. Besides, there are known to be coals in many parts of the three kingdoms, which hitherto they have had no encouragement to work.

Besides the value of this commodity as a convenience of life, as an article of commerce, and as giving rise to a nursery of seamen for the increase of the marine; other important advantages deserve to be noticed. Coals are in many respects, and in a very high degree, useful to the landed interest; not only by raising exceedingly the real value, and of course the purchase, of those lands in which they are found, and those through which it is necessary to pass * from the works to the places where they are embarked, but from the general improvements they have occasioned; so that very few counties are now better cultivated than Northumberland, and the same effects they have had in a greater or less degree in other places. Thousands of laborious people are employed in and about the mines; thousands more in conveying them to the ports, and on board the ships; to say nothing of those that draw their subsistence from the carriage of them by land to supply families, &c. There are also great numbers that live in a superior station; as stewards, directors,

* These are emphatically styled *way-leavers*, and are let at as high rents as any landed property in Britain.

factors, agents, book-keepers, &c. To these we may add the extraordinary encouragement given to ingenious artists who have invented, and the numerous workmen continually employed about those several curious and costly machines which, for a variety of purposes in this business, are in continual use, and of course in continual wear; we may join to these the multitudes that obtain their living from the many manufactures in which they are employed, and which could not be carried on but by the help and cheapness of coals. Lastly, the produce of coals exported, which amounts to a very considerable sum, besides being profitable to the owners, merchants, and mariners, is so much clear gain to the nation.

It might be expected, that a trade so beneficial to individuals, and to the nation in general, and which has been gradually increasing for several centuries past, would have been advanced by this time to very great perfection, and reduced to a regular system. But, in one very essential respect, it is found to be quite otherwise. The art of working coal-mines in the most profitable manner is indeed highly improved; but the fundamental of the art, that of searching for and discovering coal in any district of country where it has not yet been found, has never, that we know of, been treated in a systematic manner. The reader, therefore, will not be displeased to find this defect supplied in the course of the present article, together with a detail of all the other operations in the business of coaleries.

The terrestrial matters which compose the solid parts of the earth are disposed in strata, beds, or layers, the under surface of one bearing against or lying upon the upper surface of that below it, which last bears or lies on the next below in the same manner.

These strata consist of very different kinds of matter, such as free-stone, lime-stone, metal-stone or whinstone, coal, &c. as will be particularly specified in the sequel.

Some of these strata are of a considerable thickness, being often found from 100 to 200 feet or upwards, nearly of the same kind of matter from the superior to the inferior surface; and others are found of the least thickness imaginable, one inch or less.

All these strata are divided or parted from each other laterally, either by their even, smooth, polished surfaces, with very thin lamina of soft or dusty matter betwixt them, called *the parting*, which renders them easy to separate; or else only by the surfaces closely conjoined to each other, without any visible matter interposed betwixt them: yet the different substance of each stratum is not in the least intermixed, though sometimes they adhere so strongly together, that it is very difficult to part or disjoin them: in this last case they are said to have a *bad parting*.

Besides this principal division or parting laterally, there are, in some strata, secondary divisions or partings also laterally, separating or approaching towards a separation, of the same stratum, into parts of different thicknesses, nearly parallel to each other, in the same manner as the principal partings divide the different strata from each other: but these secondary ones are not so strong or visible, nor make so effectual a parting, as the principal ones do; and are only met with

Coalery.

4
Situation of
the strata.

Coalery. with in such strata, as are not of an uniform hardness, texture, or colour, from the upper to the under surface.

There are other divisions or partings, called *backs*, in almost every stratum, which cross the former lateral ones longitudinally, and cut the whole stratum through its two surfaces into long rhomboidal figures. These again are crossed by others called *cutters*, running either in an oblique or perpendicular direction to the last mentioned backs, and also cut the stratum through its two surfaces. Both these backs and cutters generally extend from the upper or superior stratum down through several of the lower ones; so that these backs and cutters, together with the lateral partings before mentioned, divide every stratum into innumerable cubic, prismatic, and rhomboidal figures, according to the thickness of the stratum, and the position and number of the backs and cutters. They sometimes have a kind of thin partition of dusty or soft matter in them, and sometimes none, like the first mentioned partings; but the softer kind of strata generally have more backs and cutters than the harder kind, and they do not extend or penetrate through the others.

Plate
EXLIX.

To explain this a little further, let A, B, C, D, E, F, G, (fig. 1.) represent the principal partings before mentioned, or the upper and under surfaces of any stratum; then *a, b, c, d, e, f,* will represent the secondary lateral partings nearly parallel to the principal ones; *g, h, i, k, l, m,* the longitudinal partings called *backs*; *n, o, p, q, r, s,* the cross partings called *cutters*, crossing the last mentioned ones either obliquely or perpendicular.

In all places where the strata lie regular, they are divided and subdivided in the manner above mentioned; and sometimes in this manner extend through a pretty large district of country; though it is often otherwise; for their regularity is frequently interrupted, and the strata broken and disordered, by sundry chasms, breaches, or fissures, which are differently denominated according to their various dimensions, and the matters with which they are filled, viz. dikes, hitches, and troubles, which shall be explained in order.

5
Dikes.

Dikes are the largest kind of fissures. They seem to be nothing but a crack or breach of the solid strata, occasioned by one part of them being broken away and fallen from the other. They generally run in a straight line for a considerable length, and penetrate from the surface to the greatest depth ever yet tried, in a direction sometimes perpendicular to the horizon, and sometimes obliquely. The same kind of strata are found lying upon each other in the same order, but the whole of them greatly elevated or depressed, on the one side of the dike as on the other. These fissures are sometimes two or three feet wide, and sometimes many fathoms. If the fissure or dike be of any considerable width, it is generally filled with heterogeneous matter, different from that of the solid strata on each side of it. It is sometimes found filled with clay, gravel, or sand; sometimes with a confused mass of different kinds of stone lying edgeways; and at other times with a solid body of free-stone, or even whin stone. When the fissure is of no great width, as suppose two or three feet only, it is then usually found filled with

a confused mixture of the different matters which compose the adjoining strata, consolidated into one mass. If the dike runs or stretches north and south, and the same kind of strata are found on the east side of the dike, in a situation with respect to the horizon 10 or 20 fathoms lower than on the other side, it is then said to be a *dip-dike* or *downcast-dike* of 10 or 20 fathoms to the eastward; or counting from the east side, it is then said to be a *rise-dike* or *upcast* of so many fathoms westward. If the strata on one side are not much higher or lower with respect to the horizontal line, than those on the other, but only broken off and removed to a certain distance, it is then said to be a dike of so many fathoms thick, and from the matter contained between the two sides of the fissure or dike, it is denominated a *clay-dike*, *stone-dyke*, &c.

A *hitch* is only a dike or fissure of a smaller degree, by which the strata on one side are not elevated or separated from those on the other side above one fathom. These hitches are denominated in the same manner as dikes, according to the number of feet they elevate or depress the strata.

There are dikes (though they are not often met with in the coal-countries) whose cavities are filled with sparr, the ores of iron, lead, vitriol, or other metallic or mineral matters; and it is pretty well known, that all metallic veins are nothing else than what in the coal countries are called *dikes*.

The strata are generally found lying upon each other in the same order on one side of the dike as on the other, as mentioned above, and nearly of the same thicknesses, appearing to have been originally a continuation of the same regular strata, and the dike only a breach by some later accident, perpendicularly or obliquely down through them, by which one part is removed to a small distance, and depressed to a lower situation than the other. But this is not the only alteration made in the strata by dikes; for generally to a considerable distance on each side of the dike, all the strata are in a kind of shattered condition, very tender, easily pervious to water, and debased greatly in their quality, and their inclination to the horizon often altered.

Troubles may be denominated dikes of the smallest degree; for they are not a real breach, but only a tendency towards it, which has not taken a full effect. The strata are generally altered by a trouble from their regular site to a different position. When the regular course of the strata is nearly level, a trouble will cause a sudden and considerable ascent or descent; where they have, in their regular situation, a certain degree of ascent or descent, a trouble either increases or alters it to a contrary position: and a trouble has these effects upon the strata in common with dikes, that it greatly debases them from their original quality; the partings are separated; the backs and cutters disjoined, and their regularity disordered; the original cubic and prismatic figures, of which the strata were composed, are broken, the dislocation filled with heterogeneous matter, and the whole strata are reduced to a softer and more friable state.

The strata are seldom or never found to lie in a true horizontal situation; but generally have an inclination or descent, called the *dip*, to some particular part of the horizon. If this inclination be to the eastward,

Coalery.
8
Dip and
rise of the
strata.

Coalery.

ward, it is called an *east dip*, and a *west rise*; and according to the point of the compass to which the dip inclines, it is denominated, and the ascent or rise is to the contrary point. This inclination or dip of the strata is found to hold everywhere. In some places, it varies very little from the level; in others, very considerably; and in some so much, as to be nearly in a perpendicular direction: but whatever degree of inclination the strata have to the horizon, if not interrupted by dikes, hitches, or troubles, they are always found to lie in the first regular manner mentioned. They generally continue upon one uniform dip until they are broken or disordered by a dike, hitch, or trouble, by which the dip is often altered, sometimes to a different part of the horizon, and often to an opposite point; so that on one side of a dike, hitch, or trouble, if the strata have an east dip, on the other side they may have an east rise, which is a west dip; and in general, any considerable alteration in the dip is never met with, but what is occasioned by the circumstances last mentioned.

are commonly covered over and evened by those beds of gravel, clay, sand, or soil, which lie uppermost, and form the outward surface of the earth. Wherever these softer matters have been carried off, or removed by accident, as on the tops of hills and the sides of vallies, there the solid strata are exposed, and the dip, rise, and other circumstances of them may be examined; but no certain conclusions can be drawn, merely from the unevenness and inequalities of the outward surface.

The preceding observations, upon the general disposition of the solid strata, are equally applicable to the strata of coal as to those of stone or other matter.

We shall next give an account of the several strata of coal, and of stone, and other matters, which are usually connected with coal, and are found to have a particular affinity with it; and, for the sake of distinction, shall arrange them into six principal classes, which will include all the varieties of strata that have been found to occur in all those districts of country, both in Scotland and England, where coal abounds.

Description
of the strata
connected
with
coal.

Plate
CXLIX.

To illustrate what has been said, see fig. 2. where *a, b, c, d, &c.* represent a course of strata lying upon each other, having a certain inclination to the horizon. *AB*, is a downcast-dike, which depresses the strata obliquely to *efgh*, &c. lying upon each other in the same order, but altered in their inclination to the horizon. *CD* represents a clay or freestone dike, where the strata are neither elevated nor depressed, but only broken off and removed to a certain distance. *EF*, represents a hitch, which breaks off and depresses the strata only a little, but alters their inclination to the horizon. *GH*, represents a trouble, where the strata on one side are not entirely broken off from those on the other, but only in a crushed and irregular situation.

As some particular strata are found at some times to increase, and at other times to diminish, in their thicknesses, whilst others remain the same, consequently they cannot be all parallel; yet this increase and diminution in their thicknesses come on very gradually.

The strata are not found disposed in the earth according to their specific gravities; for we often find strata of very dense matter near the surface, and perhaps at 50 or even 100 fathoms beneath, we meet with strata of not half the specific gravity of the first. A stratum of iron ore is very often found above one of coal, though the former has twice the gravity of the latter; and, in short, there is such an absolute uncertainty in forming any judgment of the disposition of the strata from their specific gravities, that it cannot in the least be relied upon.

It has been imagined by many, that hills and vallies are occasioned by those breaches in the strata before mentioned called *dikes*; but this is contradicted by experience. If it was so, we should meet with dikes at the skirts of the hills, and by the sides of vallies, and the sea-shore; but instead of that, we generally find the strata lying as uniformly regular under hills and vallies, and beneath the bottom of the sea (as far as has been yet tried), as in the most champion countries. It may happen, indeed, that a dike is met with in some of these places; but that being only a casual circumstance, can never be admitted as a general cause. Whatever irregularities are occasioned in the solid strata by dikes, or other breaches,

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1. *Of Whin-stone.*] The strata of what is denominated whin-stone are the hardest of all others; the angular pieces of it will cut glass; it is of a very coarse texture, and when broken across the grain, exhibits the appearance of large grains of sand half vitrified; it can scarcely be wrought, or broken in pieces, by common tools, without the assistance of gunpowder; each stratum is commonly homogeneous in substance and colour, and cracked in the rock to a great depth. The most common colours of these strata are black or dark blue, yet there are others of it ash-coloured and light brown. Their thickness in all the coal countries is but inconsiderable, from six or five feet down to a few inches; and it is only in a few places, they are met with of these thicknesses. In the air it decays a little, leaving a brown powder; and in the fire it cracks, and turns reddish brown. Limestone, and what is called *bastard limestone*, is sometimes, though rarely, met with in coaleries. It is a well known stone; but from its resemblance in hardness and colour is often mistaken for a kind of whin. Sometimes, particularly in hilly countries, the solid matter next the surface is found to be a kind of soft or rotten whin;—but it may be noted, that this is only a mass of heterogeneous matter disposed upon the regular strata; and that beneath this, all the strata are generally found in as regular an order as where this heterogeneous matter does not occur.

2. *Of Post-stone.*] This is a freestone of the hardest kind, and next to the limestone with respect to hardness and solidity. It is of a very fine texture; and when broken appears as if composed of the finest sand. It is commonly found in a homogeneous mass, though variegated in colour; and, from its hardness, is not liable to injury from being exposed to the weather. Of this kind of stone there are four varieties, which may be distinguished by their colour. The most common is white post, which in appearance is like Portland stone, but considerably harder; it is sometimes variegated with streaks or spots of brown, red, or black.

Gray post is also very common; it appears like a mixture of fine black and white sand: it is often variegated with brown and black streaks; the last men-

F f tioned

Coalery. tioned appear like small clouds composed of particles of coal.

Brown or yellow post is often met with of different degrees of colour; most commonly of the colour of light ochre or yellow sand. It is as hard as the rest, and sometimes variegated with white and black streaks.

Red post is generally of a dull red colour: this is but rarely met with; it is often streaked with white or black.

All these lie in strata of different thicknesses; but commonly thicker than any other strata whatever: they are separated from each other, and from other kinds of strata, by partings of coal, sand, or soft matter of different colours which are very distinguishable.

3. *Of Sand-stone.*] This is a freestone of a coarser texture than post, and not so hard; is so lax as to be easily pervious to water; when broken, is apparently of a coarse sandy substance; is friable and moulders to sand when exposed to the wind and rain; has frequently white shining spangles in it, and pebbles or other small stones enclosed in its mass. Of this, there are two kinds commonly met with, distinguished by their colours, gray and brown, which are of different shades, lighter or darker in proportion to the mixture of white in them. It is most generally found in strata of considerable thickness, without many secondary partings; and sometimes, though rarely, it is subdivided into layers as thin as the common gray slate. It has generally sandy or soft partings.

4. *Of Metal-stone.*] This is a tolerably hard stratum, being in point of hardness next to sand-stone; generally solid, compact, of considerable weight, and of an argillaceous substance, containing many nodules or balls of iron ore, and yellow or white pyrites; its partings, or the surfaces of its strata, are hard, polished, and smooth as glass. When broken, it has a dull dusky appearance (though of a fine texture), like hard dried clay mixed with particles of coal. Though hard in the mine or quarry, when exposed to the fresh air it falls into very small pieces. The most usual colour of this stone is black; but there are several other lighter colours, down to a light brown or gray. It is easily distinguished from freestone by its texture and colour, as well as by its other characteristics. It lies in strata of various thicknesses, though seldom so thick as the two last mentioned kinds of stone.

5. *Of Shiver.*] This stratum is more frequently met with in coaleries than any other. There are many varieties of it, both in hardness and colour; but they all agree in one general characteristic. The black colour is most common; it is called by the miners *black shiver*, *black metal*, or *bleas*. It is softer than metal-stone, and in the mine is rather a tough than a hard substance, is not of a solid or compact matter, being easily separable, by the multitude of its partings, &c. into very small parts, and readily absorbing water. The substance of this stratum is an indurated bole, commonly divided into thin laminæ of unequal thicknesses, which break into long small pieces when struck with force; and, on examination, they appear to be small irregular rhomboids: each of these small pieces has a polished glassy surface; and, when broken cross the grain, appears of a dry, leafy, or laminated tex-

ture, like exceedingly fine clay: it is very friable; feels to the touch like an unctuous substance; and dissolves in air or water to a fine pinguid black clay. There are almost constantly found enclosed in its strata lumps or nodules of iron ore, often real beds of the same.

There are other colours of this stratum besides black. The brown or dun shiver is very frequently met with; it agrees with the above description in every thing but colour. Gray shiver is also very common: it seems to be only a mixture of the black and dun; and by the different degrees of mixture of these colours others are produced. It lies in strata sometimes of considerable thickness, at other times not exceeding a few feet: they are commonly parted from each other by laminæ of spar, coal, or soft matter.

6. *Of Coal.*] Referring the reader, for the scientific division of coals, to MINERALOGY, and the preceding articles, we shall here consider them as distinguishable into three kinds, according to their degrees of inflammability.

1. The least inflammable kinds are those known by the name of *Welsh coal*, which is found in Wales; *Kilkenny coal*, which is found near Kilkenny in Ireland; and *blind or deaf coal*, which is found in many parts of Scotland and England. This coal takes a considerable degree of heat to kindle it, but when once thoroughly ignited will burn a long time; it remains in the fire in separate pieces without sticking together or caking; it produces neither flame nor smoke, and makes no cinder, but burns to a white stony slag: it makes a hot glowing fire like charcoal or cinders, and emits effluvia of a suffocating nature, which renders it unfit for burning in dwelling-houses, its chief use being among maltsters, dyers, &c. for drying their commodities. 2. *Open burning coal*, soon kindles, making a hot pleasant fire, but is soon consumed: it produces both smoke and flame in abundance; but lies open in the fire, and does not cake together so as to form cinders, its surface being burnt to ashes before it is thoroughly calcined in the midst; from this it has its name of an *open burning coal*; it burns to white or brown ashes very light. Of this kind is *cannel-coal*, *jet*, *parrot*, *splint*, and most of the coals in Scotland. 3. *Close burning coal*, kindles very quickly, makes a very hot fire, melts and runs together like bitumen, the very smallest culm making the finest cinders, which being thoroughly burnt, are porous and light as a pumice stone, and when broken are of a shining lead colour; it makes a more durable fire than any other coal, and finally burns to brown or reddish coloured heavy ashes. Of this kind are the *Newcastle* and several other of the English coals, and the *smithy coals* of Scotland. The open and the close burning coal mixed together, make a more profitable fire for domestic uses than either of them separate.

In all those districts of country where coal is found, there are generally several strata of it; perhaps all the different kinds above mentioned will be found in some, and only one of the kinds in others; yet this one kind may be divided into many different seams or strata, by beds of shiver or other kinds of matter interposing, so as to give it the appearance of so many separate strata.

Coalery.

Coalery
10
The order
in which
they lie.

All these strata above described, with their several varieties, do not lie or bear upon each other in the order in which they are described, nor in any certain or invariable order. Though there be found the same kinds of strata in one coalery or district as in another, yet they may be of very different thicknesses. In some places there are most of the hard kinds, in others most of the softer; and in any one district it rarely happens that all the various kinds are found; for some kinds, perhaps, occur only once or twice, whilst others occur 10 or 20 times before we reach the principal stratum of coal.

Plate
CXLLX.

In order to explain this, suppose the strata in the pit at A (fig. 3.) lie in the order *a, b, c, d, &c.* they may be so much altered in their thicknesses, by reason of some of them increasing and others diminishing, at the distance of B, that they may be found there of very different thicknesses; or if they are examined in a pit at D, by reason of its lower situation, and the strata there not being a continuation of those in the other places, they may be very different both in their order and thicknesses, and yet of the same kinds.

Though they be thus found very different in one coalery or district from what they are found to be in another, with respect to their thicknesses, and the order in which they lie upon each other, yet we never meet with a stratum of any kind of matter but what belongs to some of those above described.

To illustrate how the various strata lie in some places, and how often the same stratum may occur below the surface and the coal, we shall give the following example. The numbers in the left-hand column refer to the classes of strata before described, to which each belongs. The second column contains the names of the strata; and the four numeral columns to the right hand, express the thickness of each stratum, in fathoms, yards, feet, and inches.

EXAMPLE.

N ^o		Fas	Yds	Ft.	Ins.
	Soil and gravel	0	1	1	0
	Clay mixed with loose stones	1	1	0	0
3	Coarse brown sand-stone, with soft partings	3	0	2	6
2	White post, with shivery partings	1	1	0	5
5	Black shiver or bleas, with iron-stone balls	2	0	2	0
6	Coarse splinty coal	0	0	2	6
5	Soft gray shiver	0	1	0	7
2	Brown and gray post, streaked with black	1	0	2	0
5	Black shiver, with beds and balls of iron-stone,	0	1	2	6
4	Gray and black metal-stone	0	1	1	9
2	White and brown post	1	1	0	0
5	Black and gray shiver, streaked with white	0	1	0	6
3	Soft gray sand-stone, with shivery partings	0	1	1	0
2	Yellow and white post, with sandy partings	1	0	2	0
5	Black and dun shiver, with iron-stone balls	0	1	2	6
2	White post streaked with black, and black partings	1	0	0	6
5	Gray shiver, with iron-stone balls	0	1	0	9
4	Brown and black metal-stone	1	1	2	6
5	Hard flaty black shiver	1	1	0	0
6	Coal, hard and fine splint	0	0	3	6
5	Soft black shiver	0	0	0	3
6	Coal, fine and clear	0	0	3	3
5	Hard black shiver	0	0	1	0
Total Fathoms		25	0	0	0

In this instance the species of sand-stone only occurs twice, post five times, whilst the shiver occurs no less than nine times.

Coalery.

To apply the foregoing observations to practice.

Suppose it was required to examine whether there was coal in a piece of ground adjoining to, or in the neighbourhood of, other coaleries.

In the first place, it is proper to be informed, at some of the adjacent coaleries, of the number and kinds of strata, the order in which they lie upon each other; to what point of the horizon, and in what quantity, they dip; if any dikes, hitches, or troubles, and the course they stretch. Having learnt these circumstances, search in the ground under examination where the strata are exposed to view, and compare these with the other. If they be of the same kinds, and nearly correspond in order and thickness, and be lying in a regular manner, and agree by computation with the dip and rise, it may safely be concluded the coal is there; and the depth of it may be judged from the depth of the coal in the other coalery, below any particular stratum which is visible in this.

11
Methods of
searching
for coal.

Rule 1st.

If the solid strata are not exposed to view, neither in the hills nor valleys of the ground under examination, then search in the adjoining grounds, and if the same kind of strata are found there as in the adjacent coalery, and there is reason, from the dip and other circumstances, to believe that they stretch through the ground to be examined; it may then be concluded that the coal is there, as well as these other strata.

Rule 2d.

Suppose a coalery is on the side of a hill at A, fig. 3. and you would search for a coal at B, on the other side of the hill, but in a much lower situation; by observing the several strata lying above the coal at A, and the point to which they dip, which is directly towards B (if clear of dikes), you may expect to find the same kind of strata on the other side of the hill, but much lower down. Accordingly, if some of the strata are visible in the face of the precipice C, they may be compared with some of those in the pit at A. Or, if they are not to be seen there, by searching in the opposite hill, they may perhaps be discovered at the place F; where, if they be found in the manner before mentioned, and there be reason to believe they extend regularly from the first place to this, it is more than probable the coal, as well as these strata, will be found in the intermediate ground.

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If the ground to be examined lie more to the rise of the coal, as at E, which being supposed to be on a flat, perhaps the solid strata there may be wholly covered by the gravel, clay, &c. of the outward surface lying upon them. In this case, by measuring the horizontal distance and the descent of ground from A to E, and computing the quantity of ascent or rise of the coal in that distance; by comparing these together, it may be judged at what depth the coal will be found there, allowing that it lie regular. Thus, suppose the coal at A 80 yards deep, the distance from A to E 500 yards, and that the coal rises one yard in 10 of horizontal distance:

Rule 3d.

Then, from the depth of the pit
Deduct the descent of ground from A to
E, suppose

Then, from the depth of the pit	80
Deduct the descent of ground from A to	
E, suppose	24

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This remainder would be the depth, if the coal was level - - - 56
 But as the coal rises 1 in 10 yards, then deduct what it rises in 500 yards, which is - - - 50
 —

And the remainder is the depth of that coal at E. 6 Yards.

Rule 4th.

Or suppose that the place at B is 500 yards the contrary way, or to the full dip of the coal at A; if a view of the solid strata cannot be obtained, then by proceeding in the same manner as before, the depth of the coal at that place may be computed. Thus,

To the depth of the coal at the pit A 80
 Add the descent or inclination of the coal in 500 yards, which, as before, is - - - 50
 —

This sum would be the depth, if the ground was level - - - 130
 But as the ground descends towards B, deduct the quantity of that, which suppose - - - 80
 —

Remains the depth of the coal at B 50 Yards.

If the place to be examined be neither to the full dip nor full rise, but in some proportion towards either, the same method may be pursued, computing how much the coal rises or dips in a certain distance in that direction.

If there is known to be a dike in the workings of the pit at A, which elevates or depresses the strata towards the place under examination, then the quantity of the elevation or depression must be accordingly added to or deducted from the computed depth of the coal at that place. Suppose there is an upcast dike of 10 fathoms or 20 yards towards B, then deduct 20 from 50, the depth before computed, there will remain 30 yards or 15 fathoms for the depth of the coal at B.

But it often happens that coal is to be searched for, in a part of the country, at such a considerable distance from all other coaleries, that by reason of the intervention of hills, vallies, unknown dikes, &c. the connexion or relation of the strata with those of any other coalery cannot be traced by the methods last mentioned; in which case a more extensive view must be taken of all circumstances than was necessary in the former; and a few general rules founded on the foregoing observations, and on conclusions drawn from them, will greatly assist in determining sometimes with a great degree of probability, and sometimes with absolute certainty, whether coal be in any particular district of country or not.

Rule 5th.

The first proper step to be taken in such a case, is to take a general view of that district of country intended to be searched, in order to judge, from the outward appearance or face of the country, which particular part out of the whole is the most likely to contain those kind of strata favourable to the production of coal; and consequently such particular part being found, is the most advisable to be begun with in the examination.

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Though the appearance of the outward surface gives no certain or infallible rule to judge of the kinds of strata lying beneath, yet it gives a probable one; for it is generally found, that a chain of mountains or hills rising to a great height, and very steep on the sides, are commonly composed of strata much harder and of different kinds from those before described wherein coal is found to lie, and therefore unfavourable to the production of coal; and these mountainous situations are also more subject to dikes and troubles than the lower grounds; so that if the solid strata composing them gave even favourable symptoms of coal, yet the last circumstance would render the quality bad, and the quantity precarious. And, on the whole it may be observed, that mountainous situations are found more favourable to the production of metals than of coal. It is likewise generally found that those districts abounding with valleys, moderately rising hills, and interspersed with plains, sometimes of considerable extent, do more commonly contain coal, and those kinds of strata favourable to its production, than either the mountainous or champaign countries; and a country so situated as this last described, especially if at some considerable distance from the mountains, ought to be the first part appointed for particular examination. Plains, or level grounds of great extent, generally situated by the sides of rivers, or betwixt such moderate rising grounds as last described, are all very favourable to the production of coal, if the solid strata, and other circumstances in the higher grounds adjoining, be conformable; for it will scarcely be found, in such a situation, that the strata are favourable in the rising grounds, on both sides of the plain, and not so in the space betwixt them. Though plains be so favourable, in such circumstances, to the production of coal, yet it is often more difficult to be discovered in such a situation, than in that before described; because the clay, soil, and other lax matter, brought off the higher grounds by rains and other accidents, have generally covered the surfaces of such plains to a considerable depth, which prevents the exploration of the solid strata there, unless they be exposed to view by digging, quarrying, or some such operation.

That part of the district being fixed upon which abounds with moderate hills and valleys as properest to begin the examination at, the first step to be taken is to examine all places where the solid strata are exposed to view (which are called the *crops* of the strata), as in precipices, hollows, &c. tracing them as accurately and gradually as the circumstances will allow, from the uppermost stratum or highest part of the ground to the very undermost: and if they appear to be of the kinds before described, it will be proper to note in a memorandum book their different thicknesses; the order in which they lie upon each other; the point of the horizon to which they dip or incline, the quantity of that inclination, and whether they lie in a regular state. This should be done in every part of the ground where they can be seen, observing at the same time, that if a stratum can be found in one place, which has a connection with some other in a second place, and if this other has a connection with another in a third place, &c.; then, from these separate connections, the joint correspondence of the whole may

¹² Mountainous situations.

¹³ Hills and valleys.

¹⁴ Plains.

Coalery. be traced, and the strata, which in some places are covered, may be known by their correspondence with those which are exposed to view.

If by this means the crops of all the strata cannot be seen (which is often the case), and if no coal be discovered by its crop appearing at the surface; yet if the strata that have been viewed consist of those kinds before described, and are found lying in a regular order, it is sufficiently probable that coal may be in that part of the district, although it be concealed from sight by the surface of earth or other matter.

Rule 6th. Therefore, at the same time that the crops of the strata are under examination, it will be proper to take notice of all such springs of water as seem to be of a mineral nature, particularly those known by the name of iron water, which bear a mud or sediment of the colour of rust or iron, having a strong astringent taste. Springs of this kind proceed originally from those strata which contain beds or balls of iron-ore; but by reason of the tenacity of the matter of those strata, the water only disengages itself slowly from them, descending into some more porous or open stratum below, where, gathering in a body, it runs out to the surface in small streams or rills. The stratum of coal is the most general reservoir of this water; for the iron-stone being lodged in different kinds of shiver, and the coal commonly connected with some of them, it therefore descends into the coal, where it finds a ready passage through the open backs and cutters. Sometimes, indeed, it finds some other stratum than coal to collect and transmit it to the surface; but the difference is easily distinguishable; for the ochrey matter in the water, when it comes from a stratum of coal, is of a darker rusty colour than when it proceeds from any other, and often brings with it particles and small pieces of coal; therefore, wherever these two circumstances concur in a number of these kind of springs, situated in a direction from each other answerable to the stretch or to the inclination of the strata, it may be certain the water comes off coal, and that the coal lies in a somewhat higher situation than the apertures of the springs.

There are other springs also which come off coal, and are not distinguishable from common water, otherwise than by their astringency, and their having a blue scum of an oily or glutinous nature swimming upon the surface of the water. These, in common with the others, bring out particles of coal, more especially in rainy seasons when the springs flow with rapidity. When a number of these kinds are situated from each other in the direction of the strata, as above described; or if the water does not run forth as in springs, but only forms a swamp, or an extension of stagnant water beneath the turf; in either case, it may be depended upon that this water proceeds from a stratum of coal.

Rule 7th. If the stratum of coal is not exposed to view, or cannot be discovered by the first method of searching for the crop, although the appearance of the other strata be very favourable, and afford a strong probability of coal being there; and if the last-mentioned method of judging of the particular place where the crop of the coal may lie, by the springs of water issuing from it, should, from the deficiency of those springs or other circumstances, be thought equivocal, and

Coalery. not give a satisfactory indication of the coal; then a further search may be made in all places where the outward surface, or the stratum of clay or earth, is turned up by ploughing, ditching, or digging, particularly in the lower grounds, in hollows, and by the sides of streams. These places should be strictly examined, to see if any pieces of coal be intermixed with the substance of the superior lax strata; if any such be found, and if they be pretty numerous and in detached pieces, of a firm substance, the angles perfect or not much worn, and the texture of the coal distinguishable, it may be concluded, that the stratum of coal to which they originally did belong is at no great distance, but in a situation higher with respect to the horizon; and if there be also found along with the pieces of coal other mineral matter, such as pieces of shiver or freestone, this is a concurrent proof that it has come only from a small distance. Though the two fore-mentioned methods should only have produced a strong probability, yet if this last-mentioned place, where the pieces of coal, &c. are found in the clay, be in a situation lower than the springs; when this circumstance is joined to the other two, it amounts to little less than a moral certainty of the stratum of coal being a very little above the level of the springs. But if, on the contrary, these pieces of coal are found more sparingly interspersed in the superior stratum, and if the angles are much fretted or worn off, and very little of other kinds of mineral matter connected with them; it may then be concluded, that they have come from a stratum of coal situated at a greater distance than in the former case; and by a strict search and an accurate comparison of other circumstances, that particular place may be discovered with as much certainty as the other.

After the place is thus discovered, where the stratum of coal is expected to lie concealed, the next proper step to be taken, is to begin digging a pit or hole there perpendicularly down to find the coal. If the coal has no solid strata above and beneath it, but be found only embodied in the clay or other lax matter, it will not be there of its full thickness, nor so hard and pure as in its perfect state when enclosed betwixt two solid strata, the uppermost called the *roof*, and the undermost called the *pavement*, of the coal: in such situation therefore it becomes necessary, either to dig a new pit, or to work a mine forward until the stratum of coal be found included betwixt a solid roof and pavement, after which it need not be expected to increase much in its thickness: yet as it goes deeper or farther to the dip, it most likely will improve in its quality; for that part of the stratum of coal which lies near the surface, or only at a small depth, is often debased by a mixture of earth and sundry other impurities, washed down from the surface, through the backs and cutters, by the rains; whilst the other part of the stratum which lies at a greater depth is preserved pure, by the other solid strata above it intercepting all the mud washed from the surface.

The above methods of investigation admit of many different cases, according to the greater or less number of favourable circumstances attending each of the modes of inquiry; and the result accordingly admits every degree of probability, from the most distant, even up to absolute certainty. In some situations, the coal

Coalery. will be discovered by one method alone, in others, by a comparison of certain circumstances attending each method; whilst in some others, all the circumstances that can be collected only lead to a certain degree of probability.

In the last case, where the evidence is only probable, it will be more advisable to proceed in the search by boring a hole through the solid strata (in the manner hereafter described), than by digging or sinking a pit, it being both cheaper and more expeditious; and in every case, which does not amount to an absolute certainty, this operation is necessary, to ascertain the real existence of the coal in that place.

We shall now suppose that, having examined a certain district, situated within a few miles of the sea or some navigable river, that all the circumstances which offer only amount to a probability of the coal being there, and that boring is necessary to ascertain it. We shall therefore describe the operation of boring to the coal; then the method of clearing it from water, commonly called *winning* it; and all the subsequent operations of working the coal and raising it to the surface, leading it to the river or harbour, and finally putting it on board the ships.

Suppose that the ground, A, B, C, D, fig. 4. has been examined, and from the appearance of the strata where they are visible (as at the precipice D, and several other places), they are found to be of those kinds usually connected with coal, and that the point to which they rise is directly west towards A, but the ground being flat and covered to a considerable depth with earth, &c. the strata cannot be viewed in the low grounds; therefore, in this and all similar situations, the first hole that is bored for a trial for coal should be on the west side of the ground, or to the full rise of the strata as at A, where, boring down through the strata 1, 2, 3, suppose 10 fathoms, and not finding coal, it will be better to bore a new hole than to proceed to a great depth in that; therefore, proceeding so far to the eastward as B, where the stratum 1, of the first hole, is computed to be 10 or 12 fathoms deep, a second hole may be bored, where boring down through the strata 4, 5, 6, 7, 8, the stratum 1 is met with, but no coal; it would be of no use to bore farther in this hole, as the same strata would be found which were in the hole A: therefore, proceeding again so far to the eastward, as it may be computed the stratum 4 of the second hole will be met with at the depth of 10 or 12 fathoms, a new hole may be bored C, where, boring through the strata 9, 10, 11, 12, the coal is met with at 13, before the hole proceed so deep as the stratum 4 of the former. It is evident, that, by this method of procedure, neither the coal nor any other of the strata can be passed over, as the last hole is always bored down to that stratum which was nearest the surface in the former hole.

The purposes for which boring is used are numerous, and some of them of the utmost importance in coaleries. In coaleries of great extent, although the coal be known to extend through the whole grounds, yet accidental turns, and other alterations in the dip, to which the coal is liable, render the boring of three or more holes necessary, to determine exactly to what point of the horizon it dips or inclines, before any capital operation for the winning of it can be undertaken; because a

very small error in this may occasion the loss of a great part of the coal, or at least incur a double expence in recovering it.

Suppose A, B, C, D, fig. 5. to be part of an extensive field of coal, intended to be won or laid dry by a fire-engine; according to the course of the dip in adjoining coaleries, the point C is the place at which the engine should be erected, because the coal dips in direction of the line AC, consequently the level line would be in the direction CD; but this ought not to be trusted to. Admit two holes, 1, 2, be bored to the coal in the direction of the supposed dip, at 200 yards distance from each other, and a third hole 3 at 200 yards distance from each of them: suppose the coal is found, at the hole 1, to be 20 fathoms deep; at the hole 2, 10 fathoms deeper; but at the hole 3, only 8 fathoms deeper than at 1. Then to find the true level line and dip of the coal, say, As 10 fathoms, the dip from 1 to 2, are to 200 yards the distance, so are 8 fathoms, the dip from 1 to 3, to 160 yards, the distance from one on the line 1, 2, to a, the point upon a level with the hole 3. Again say, As 8 fathoms, the dip from 1 to 3, are to 200 yards the distance; so are 10 fathoms, the dip from 1 to 2, to 250 yards, the distance from 1, in direction of the line 1, 3, to b, the point upon a level with the hole 2. Then let fall the perpendicular 1, c, which will be the true direction of the dip of the coal, instead of the supposed line AC; and by drawing ED, and DF, parallel to the other lines, the angle D, and no other place, is the deepest part of the coal, and the place where the engine should be erected. If it had been erected at the angle C, the level line would have gone in the direction cb, by which means about one-third part of the field of coal would have been below the level of the engine, and perhaps lost, without another engine was erected at D.

Boring not only shows the depth at which the coal lies, but its exact thickness; its hardness; its quality, whether close burning or open burning, and whether any foul mixture is in it or not; also the thickness, hardness and other circumstances of all the strata bored through; and from the quantity of water met with in the boring, some judgment may be formed of the size of an engine capable of drawing it, where an engine is necessary. When holes are to be bored for these purposes, they may be fixed (as near as can be guessed) in such a situation from each other, as to suit the places where pits are afterwards to be sunk; by which means most of the expence may be saved, as these pits would otherwise require to be bored, when sinking, to discharge their water into the mine below. There are many other uses to which boring is applied, as will be explained hereafter.

For these reasons, boring is greatly practised in England, and is brought to great perfection; and as the operation is generally entrusted to a man of integrity, who makes it his profession, the accounts given by him of the thickness and other circumstances of the strata, are the most accurate imaginable, and are trusted to with the greatest confidence; for as very few gentlemen choose to take a lease of a new coalery which has not been sufficiently explored by boring, it is necessary the accounts should be faithful, being the only rule to guide the landlord in letting his coal, and the tenant

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tenant in taking it. In Scotland it is not so generally practised; nor are there any men of character who are professed borers, that operation being commonly left to any common workman; whence it happens that it never has been in any esteem, the accounts given by them being so imperfect and equivocal as not to merit any confidence.

The tools or instruments used in boring are very simple. The boring rods are made of iron from 3 to 4 feet long, and about one inch and a half square, with a screw at each end, by which they are screwed together, and other rods added as the hole increases in depth. The chisel is about 18 inches long, and two and a half broad at the end, which being screwed on at the lower end of the rods, and a piece of timber put through an eye at the upper end, they are prepared for work. The operation is performed by lifting them up a little, and letting them fall again, at the same time turning them a little round; by a continuance of which motions, a round hole is fretted or worn through the hardest strata. When the chisel is blunt, it is taken out, and a scooped instrument called a *wimble* put on in its stead; by which the dust or pulverized matter which was worn off the stratum in the last operation is brought up. By this substance, the borers know exactly the nature of the stratum they are boring in: and by any alteration in the working of the rods (which they are sensible of by handling them), they perceive the least variation of the strata. The principal part of the art depends upon keeping the hole clean, and observing every variation of the strata with care and attention.

The established price of boring in England was some time ago 5s. per fathom for the first five fathoms, 10s. per fathom for the next five fathoms, and 15s. per fathom for the next five fathoms; and so continually increasing 5s. per fathom at the end of every five fathoms; the borer finding all kinds of boring instruments, and taking his chance of the hardness of the strata, except above one foot in thickness of whin occur, when the former price ceases, and he is paid per day.

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Of winning
the coal.

It is exceedingly uncommon to meet with a stratum of coal which is naturally dry, or whose subterranean springs or feeders of water are so very small as to require no other means than the labour of men to draw off or conduct them away; for it most commonly happens that the stratum of coal, and the other strata adjacent, abound so much in feeders of water, that, before access can be had to the coal, some other methods must be pursued to drain or conduct away these feeders; therefore, after the deepest part of the coal is discovered, the next consideration is of the best method of draining it, or, in the miners language, *of winning the coal*.

If the coal lies in such an elevated situation, that a part of it can be drained by a level brought up from the lower grounds, then that will be the most *natural* method; but whether it be the most *proper* or not, depends upon certain circumstances. If the situation of the ground be such, that the level would be of a great length, or have to come through very hard strata, and the quantity of coal it would drain, or the profits expected to be produced by that coal, should be inadequate to the expence of carrying it up; in such case some other method of winning might be more proper.

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Or suppose, in another case, it be found, that a level can be had to a coalery, which will cost 2000l. and require five years to bring it up to the coal, and that it will drain 30 acres of coal when completed; yet if it be found that a fire engine, or some other machine, can be erected on that coalery, for the same sum of money, in one year, which will drain 50 acres of the same coal, then this last would be a more proper method than the level; because four years profit would be received by this method before any could come in by the other; and after the 30 acres drained by the level is all wrought, a machine of some kind would nevertheless be necessary to drain the remaining 20 acres; so that erecting a machine at first would be on all accounts the most advisable.

Where a level can be driven, in a reasonable time, and at an adequate expence, to drain a sufficient tract of coal, it is then the most eligible method of winning; because the charge of upholding it is generally less than that of upholding fire-engines or other machines.

If a level is judged properest after consideration of every necessary circumstance, it may be begun at the place appointed in the manner of an open ditch, about three feet wide, and carried forward until it be about six or seven feet deep from the surface, taking care to secure the bottom and sides by timber-work or building, after which it may be continued in the manner of a mine about three feet wide, and three feet and a half high, through the solid strata, taking care all along to keep the bottom upon a level, and to secure the roof, sides, and bottom, by timber or building, in all places where the strata are not strong enough to support the incumbent weight, or where they are liable to decay by their exposure to the fresh air. If the mine has to go a very long way before it reaches the coal, it may be necessary to sink a small pit, for the convenience of taking out the stones and rubbish produced in working the mine, as well as to supply fresh air to the workmen; and if the air should afterwards turn damp, then square wooden pipes made of deals closely jointed (commonly called *air-boxes*), may be fixed in the upper part of the mine, from the pit-bottom all the way to the end of the mine, which will cause a sufficient circulation of fresh air for the workmen. Perhaps in a great length it will be found proper to sink another or more pits upon the mine, and by proceeding in this manner it may be carried forward until it arrive at the coal; and after driving a mine in the coal a few yards to one side, the first coal-pit may be sunk.

If a level is found impracticable, or for particular reasons unadvisable, then a fire-engine*, or some other machine will be necessary, which should be fixed upon the deepest part of the coal, or at least so far towards the dip as will drain a sufficient extent of coal, to continue for the time intended to work the coalery; and whether a fire-engine, or any other machine is used, it will be of great advantage to have a partial level brought up to the engine-pit, if the situation of the ground will admit it at a small charge, in order to receive and convey away the water without drawing it so high as to the surface; for if the pit was 30 fathoms deep to the coal, and if there was a partial level which received the water five fathoms only

* See article *Steam Engine*.

Coalery. only below the surface, the engine by this means would be enabled to draw one-sixth part more water than without it; and if there were any feeders of water in the pit above this level, they might be conveyed into it, where they would be discharged without being drawn by the engine.

The engine-pit may be from seven to nine feet wide, and whether it be circular, oval, or of any other form, is not very material, provided it be sufficiently strong, though a circular form is most generally approved. If any feeders of water are met with a few fathoms from the surface, it will be proper to make a circular or spiral cutting about one foot deep, and a little hollowed in the bottom, round the circumference of the pit, in order to receive and conduct the water down, without flying over the pit and incommoding the workmen. If the strata are of so tender or friable a nature as not to bear this operation, or if the water leaks through them, then it will be necessary to insert in the fore-mentioned cutting a circular piece of timber called a *crib*, hollowed in the same manner to collect the water; and a second may be inserted two or three yards below the first, with a sloping niche down the wall or side of the pit, to convey the water from the former into it; proceeding by some of these methods until the pit is sunk 15 or 20 fathoms, at which place it would be proper to fix a cistern or reservoir, for the first or upper set of pumps to stand in; for if the pit be 30 fathoms as supposed, it would be too great a length for the pumps to be all in one set from bottom to top; therefore, if any extraordinary feeders are met with, betwixt 15 and 20 fathoms deep, it would be best to fix the cistern where it may receive them, and prevent their descending to the bottom; observing that the upper set of pumps be so much larger than the lower one, as the additional feeders may require; or if there are no additional feeders, it ought then to be a little smaller.

After the upper cistern is fixed, the operation may be pursued by the other set of pumps in much the same manner as has been described, until the pit is sunk to the coal; which being done, it would be proper to sink it six or eight feet deeper, and to work some coal out from the dip side of the pit, to make room for a large quantity of water to collect, without incommoding the coal-pits when the engine is not working.

It would exceed the proper bounds of this article to enumerate all the accidents to which engine-pits are liable in sinking; we shall therefore only recite a few which seem important.

If a quicksand happens to lie above the solid strata, next the surface, it may be got through by digging the pit of such a wideness at the top (allowing for the natural slope or running of the sand) as to have the proper size of the pit on the uppermost solid stratum, where fixing a wooden frame or tub as the timber-work of the pit, and covering it round on the outside with wrought clay up to the top, the sand may again be thrown into the excavation round the tub, and levelled with the surface.

If the quicksand should happen to lie at a considerable depth betwixt the clay and solid strata, then a strong tub of timber closely jointed and shod with iron, of such a diameter as the pit will admit, may be let down into it; and by fixing a great weight upon

the top, and by working out the sand, it may be made to sink gradually, until it comes to the rock or other solid stratum below; and when all the sand is got out, if it be lightly calked and secured, it will be sufficient.

It sometimes happens, that a stratum of soft matter, lying betwixt two hard solid ones, produces so large a quantity of water as greatly to incommode the operations. In such a case, a frame-work of plank, strengthened with cribs and closely calked, will keep back the whole or the greatest part of it, provided the two strata which include it are of a close texture; or let an excavation of about two feet be made in the soft stratum, quite round the circumference of the pit, and let that be filled close up betwixt the hard strata with pieces of dry fir-timber about ten inches square inserted endwise, and afterwards as many wooden wedges driven into them as they can be made to receive; if this be well finished, little or no water will find a passage through it.

It rarely happens that any suffocating damp or foul air is met with in an engine-pit; the falling of water, and the working of the pumps, generally causing a sufficient circulation of fresh air. But that kind of combustible vapour, or inflammable air, which will catch fire at a candle, is often met with. It proceeds from the partings, backs, and cutters, of the solid strata, exhaling from some in an insensible manner, whilst from others it blows with as great impetuosity as a pair of bellows. When this inflammable air is permitted to accumulate, it becomes dangerous by taking fire, and burning or destroying the workmen, and sometimes by its explosion will blow the timber out of the pit, and do considerable damage. If a considerable supply of fresh air is forced down the pit by air-boxes and a ventilator, or by dividing the pit into two by a close partition of deals from top to bottom, or by any other means, it will be driven out, or so weakened, that it will be of no dangerous consequence; or when the inflammable air is very strong, it may be safely carried off by making a close sheathing or lining of thin deals quite round the circumference of the pit, from the top of the solid strata to the bottom, and lengthening it as the pit is sunk, leaving a small vacancy behind the sheathing; when the combustible matter which exhales from the strata, being confined behind these deals, may be vented by one or two small leaden pipes carried from the sheathing to the surface, so that very little of it can transpire into the area of the pit. If a candle be applied to the orifice of the pipe at the surface, the inflammable air will instantly take fire, and continue burning like an oil-lamp, until it be extinguished by some external cause. Upon the whole, every method should be used to make the pit as strong in every part, and to keep it as dry as possible; and whenever any accident happens, it should be as expeditiously and thoroughly repaired as possible, before any other operation be proceeded in, lest an additional one follow, which would more than double the difficulty of repairing it.

The first operations, after sinking the engine-pit, are of working the working or driving a mine in the coal, and sink-the coal. The situation of the first coal-pit should be a little to the rise of the engine-pit, that the water which collects there may not obstruct the working

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working of the coals every time the engine stops; and it should not exceed the distance of 20, 30, or 40 yards, because when the first mine has to be driven a long way, it becomes both difficult and expensive. If there be not a sufficient circulation of fresh air in the mine, it may be supplied by the before described air-boxes and a ventilator, until it arrives below the intended coal-pit, when the pit may be bored and sunk to the coal, in the manner before mentioned.

After the pit is thus got down to the coal, the next consideration should be, the best method of working it. The most general practice in Scotland is to excavate and take away a part only of the stratum of coal in the first working of the pit, leaving the other part as pillars for supporting the roof; and after the coal is wrought in this manner to such a distance from the pit as intended, then these pillars, or so many of them as can be got, are taken out by a second working, and the roof and other solid strata above permitted to fall down and fill up the excavation. The quantity of coal wrought away, and the size of the pillars left in the first working, is proportioned to the hardness and strength of the coal and other strata adjacent, compared with the incumbent weight of the superior strata.

The same mode of working is pursued in most parts of England, differing only as the circumstances of the coalery may require; for the English coal, particularly in the northern counties, being of a fine tender texture, and of the close-burning kind, and also the roof and pavement of the coal in general not so strong as in Scotland, they are obliged to leave a larger proportion of coal in the pillars for supporting the roof, during the first time of working; and, in the second working, as many of these pillars are wrought away as can be got with safety.

The Scots coal in general being very hard, and of the open-burning kind, it is necessary to work it in such a manner as to produce as many *great coals* as possible, which is best effected by taking away as high a proportion of the coal as circumstances will allow in the first working; on the contrary, the English coal being very tender, cannot possibly be wrought large, nor is it of much importance how small they are, being of so rich a quality; so that a larger proportion may be left in pillars in this coal than could with propriety be done in the other; and, when all circumstances are considered, each method seems well adapted to the different purposes intended.

The ancient method of working was, to work away as much of the coal as could be got with safety at one working only, by which means the pillars were left so small as to be crushed by the weight of the superior strata, and entirely lost. As great quantities of coals were lost by this method, it is now generally exploded, and the former adopted in its place, by which a much larger quantity of coal is obtained from the same extent of ground, and at a much less expence in the end.

The exact proportion of coal proper to be wrought away, and to be left in pillars at the first working, may be judged of by a comparison of the circumstances before mentioned. If the roof and pavement are both strong, as well as the coal, and the pit about 30 fathoms deep, then two-thirds, or probably three-

fourths, may be taken away at the first working, and one-third or one-fourth left in pillars. If both roof and pavement be soft or tender, then a larger proportion must be left in pillars, probably one-third or near one half; and in all cases the hardness or strength of the coal must be considered. If tender, it will require a larger pillar than hard coal; because, by being exposed to the air after the first working, a part of it will moulder and fall off, by which it will lose much of its solidity and resistance.

The proportion to be wrought away and left in pillars being determined, the next proper step is to fix upon such dimensions of the pillars to be left, and of the excavations from which the coal is to be taken away, as may produce that proportion. In order to form a just idea of which, see a plan of part of a pit's workings (fig. 6.), supposed to be at the depth of 30 fathoms, and the coal having a moderate rise. A, represents the engine-pit; B, the coal-pit; A a B, the mine from the former to the latter; BC, the first working or excavation made from the coal-pit, commonly called the *winning mine* or *winning headway*, nine feet wide; *bbbb*, &c. the workings called *rooms*, turned off at right angles from the others, of the width of 12 feet: *cccc*, &c. the workings called *througbers* or *thirlings*, 9 feet wide, wrought through at right angles from one room to another; *ddd*, &c. the pillars of coal left at the first working for supporting the roof, 18 feet long and 12 feet broad; DD, two large pillars of coal near the pit bottom, 15 or 20 yards long, and 10 or 15 broad, to support the pit, and prevent its being damaged by the roof falling in; *ee*, the level mine wrought in the coal from the engine-pit bottom, four or five feet wide; *ff*, &c. large pillars of coal left next the level, to secure it from any damage by the roof falling in; *gg*, a dike which depresses the coal, 1 fathom; *hh*, &c. large pillars and barriers of coal left unwrought, adjoining to the dike where the roof is tender, to prevent its falling down. The coal taken out by the first working in this pit is supposed to be one-third of the whole; and allowing the rooms 12 feet wide, and the thirlings 9 feet wide, then the pillars will require to be 12 feet wide and 18 feet long; for if one pillar be in a certain proportion to its adjoining room and thirling, the whole number of pillars will be in the same proportion to the whole number of rooms and thirlings in the pit. Suppose AICD (fig. 7.) to be a pillar of coal 18 feet long and 12 feet broad, its area will be 216 square feet; ACHE, the adjoining thirling, 12 feet by 9 feet, and its area 108 square feet; BA EFG, the adjoining room, 27 feet long and 12 feet broad, and its area 324 square feet; which added to 108 gives 432 square feet, or two-thirds wrought, and 216 square feet left, or one third of the whole area FGHD.

It is proper to observe, that in the prosecution of the workings, the rooms to the right of the winning headway should be opposite to the pillars on the left, and the first, third, and fifth pillar, or the second, fourth, and sixth, adjoining to the said headway, should be of such a length as to overlay the adjoining thirlings, as, in the plan, the pillar 2 overlays the thirlings 1 and 3; and the pillar 4 overlays the thirlings 3 and 5; this will effectually support the roof of the main road BC, and will bring the other pillars

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into

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into their regular order, by which means each pillar will be opposite to two thirlings. Also a larger proportion of coal than common should be left in all places which are intended to be kept open after the second working, such as the pit-bottoms, air-courses, roads, and water-courses, or where the roof is tender, as it generally is near dikes, hitches, and troubles; and if the roof should continue tender for a considerable space, it will perhaps be found proper to leave a few inches of coal adhering to the roof, which, together with a few props of timber fixed under it, may support it effectually for a long time. The level mine *ee*, and the winning headway *BC*, should be wrought forward a considerable length before the other rooms, in order to be driven through any dikes that might intercept, otherwise the progress of the workings might probably be stopped a considerable time, waiting until a course of new rooms were procured on the other side of the dike. Suppose the dike *gg*, fig. 6. to depress the coal six feet or one fathom, and that it rises in the same manner on the under side of the dike as it does on the upper side; in such a case, the only remedy would be to work or drive a level mine through the strata of stone from the engine-level at *e*, over the dike, until it intersect the coal at *i*; and from thence to drive a new level mine in the coal at *ii*, and a new winning headway *ik*. In order to gain a new set of rooms and to supply fresh air to this new operation, a small mine might be driven from the room *b*, and a hole sunk down upon the level room *ii*; therefore, if the level mine *ee* was not driven so far forward as to have all these operations completed before the rooms and other workings were intercepted by the dike, the working of the pit might cease until these new places were ready.

If there be two or three strata or seams of coal in the same pit (as there often are) having only a stratum of a few feet thick lying betwixt them, it is then material to observe, that every pillar in the second seam be placed immediately before one in the first, and every pillar in the third seam below one in the second; and in such a situation the upper stratum of coal ought to be first wrought, or else all the three together; for it would be unsafe to work the lower one first, lest the roof should break, and damage those lying above.

It sometimes becomes necessary to work the coal lying to the dip of the engine or the level; which coal is consequently drowned with water, and must therefore be drained by some means before it can be wrought. If the quantity of water proceeding from it be considerable, it may then be drained by small pumps laid upon the pavement of the coal, and wrought by men or horses, to raise the water up to the level of the engine-pit bottom; or if the feeders of water be more considerable, and the situation be suitable, the working rod of these pumps might be connected with those in the engine-pit; by which means the water would be raised up to the level; but if the quantity of water be very great; or if, from other circumstances, these methods may not be applicable; then the engine-pit may be sunk as deep below the coal as may be necessary, and a level stone mine driven from its bottom to the dip of the strata, until it intersect the stratum of coal, from whence a new level mine might be wrought, which would

effectually drain it. Suppose *AB*, fig. 8. to be a section of the engine-pit; *BC*, the coal drained by the engine; *BD*, the coal to the dip of the engine intended to be drained; then if the engine-pit be sunk deeper to *E*, a stone mine may be wrought in the direction *ED*, until it intersect the coal at *D*, by which the water will have a free passage to the engine, and the coal will be drained.

If there be another stratum of coal lying at such a depth below the first as the engine-pit is intended to be sunk to, the upper seam may in some situations be conveniently drained, by driving a mine in the lower seam of coal from *E* to *F*, and another in the upper one from *B* to *D*; and by boring a hole from *D* to *F*, the water will descend to *F*, and, filling the mine *EF*, rise up to the engine-pit bottom at *E*, which is upon a level with *D*.

Whenever it is judged necessary to work the pillars, regard must be had to the nature of the roof. If the roof is tender, a narrow room may be wrought through the pillar from one end to the other, leaving only a shell of coal on each side for supporting the roof the time of working. Suppose *ABCD*, fig. 7. to be a pillar of coal 18 feet long and 12 feet broad: if the roof is not strong, the room 1, 2, 3, 4, of eight feet wide, may be wrought up through that pillar, leaving a shell of two feet thick on each side; and if it can be safely done, a part of these shells may also be wrought away, by working two places through them as at 5 and 6. By this means very little of the coal will be lost; for two-thirds of the whole being obtained by the first working, and above two-thirds of the pillar by the second working, the loss upon the whole would not exceed one-tenth: but it may be observed, that some pillars will not produce so great a proportion, and perhaps others cannot be wrought at all; so that, upon the whole, there may be about one-sixth, one-seventh, or in some situations but one-eighth part of the coal lost. If the roof be hard and strong, then as much coal may be wrought off each side and each end of the pillar as can be done with safety, leaving only a small piece standing in the middle; and when the roof is very strong, sometimes several pillars may be taken entirely out, without any loss of coal: and in general this last method is attended with less loss, and produces larger coals, than the former. In all cases it is proper to begin working those pillars first which lie farthest from the pit bottom, and to proceed working them regularly away towards the pit; but if there be a great number of pillars to the dip of the pit, it is the safest method to work these out before those to the rise of the pit are begun with.

There is no great difference in the weight of different kinds of coals, the lightest being about 74 pounds avoirdupois, and the heaviest about 79 pounds the cubic foot; but the most usual weight is 75 pounds the foot, which is 18 hundred weight and 9 pounds the cubic yard. The statute chalders is 53 hundred weight; or when measured is as follows: 268.8 cubic inches to the Winchester gallon; $4\frac{1}{2}$ gallons to the coal peck, about 3 pounds weight; 8 coal-pecks to the boll, about $247\frac{1}{2}$ pounds; and 24 bolls to the chalders, of 53 hundred weight. If one coal measuring exactly a cubic yard (nearly equal to 5 bolls) be broken into pieces of a moderate size, it will measure seven coal bolls

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Coalery. bolls and a half. If broken very small, it will measure 9 bolls; which shews, that the proportion of the weight to the measure depends upon the size of the coals; therefore accounting by weight is the most rational method.

Coalery.

A TABLE of the weight and quantity of coal contained in one acre Scots measure, allowing one-sixth part to be lost below ground, in seams of the following thicknesses.

Thickness of Coal.		Weight in Tons.	Quantity in Chalders.
Feet.	Inches.		
2	0	3068	1158—
2	6	3835	1447+
3	0	4602	1736+
3	6	5369	2026+
4	0	6136	2315+
4	6	6903	2604+
5	0	7670	2894+
5	6	8437	3183+
6	0	9204	3473+

We shall next mention some of the various methods of bringing the coals from the rooms and other workings to the pit-bottom. Where the stratum of coal is of a sufficient thickness, and has a moderate rise and dip, the coals are most advantageously brought out by horses, who draw out the coals in a tub or basket placed upon a sledge: a horse by this means will bring out from four to eight hundred weight of coals at once, according to the quantity of the ascent or descent. In some coaleries they have access to the workings by a mine made for them, sloping down from the surface of the earth to the coal; and where that convenience is wanting, they are bound into a net, and lowered down the pit. If the coal be not of such a height as to admit horses, and has a moderate rise like the last, then men are employed to bring out the coals: they usually draw a basket of four or five hundred weight of coals, fixed upon a small four-wheeled carriage. There are some situations in which neither horses nor men can be properly used; particularly where the coal has a great degree of descent, or where many dikes occur: in such a case the coals are best brought out by women called *bearers*, who carry them in a kind of basket upon their backs, usually a hundred, or a hundred weight and a half, at once.

When the coals are brought to the pit-bottom, the baskets are then hooked on to a chain, and drawn up the pit by a rope to the surface, which is best effected by a machine called a *gin*, wrought by horses. There are other kinds of gins for drawing coals, some wrought by water, others by the vibrating lever of a fire-engine, but either of these last is only convenient in some particular situations, those wrought by horses being in most general use. After the coals are got to the surface, they are drawn a small distance from the pit, and laid in separate heaps: the larger coals in one heap, the smaller pieces called *chews* in another, and the *culm* or *pan-coal* in a separate place.

There is an accident of a very dangerous nature, to which all coaleries are liable, and which has been the ruin of several; it is called a *crush*, or a *fit*. When

the pillars of coal are left so small as to fail, or yield under the weight of the superior strata; or when the pavement of the coal is so soft as to permit the pillars to sink into it, which sometimes happens by the great weight that lies upon them; in either case the solid stratum above the coal breaks and falls in, crushes the pillar to pieces, and closes up a great extent of the workings, or probably the whole coalery. As such an accident seldom comes on suddenly, if it be perceived in the beginning, it may sometimes be stopped by building large pillars of stone amongst the coal pillars: but if it has already made some progress, then the best method is to work away as many of the coal pillars adjoining to the crush as may be sufficient to let the roof fall freely down; and if it makes a breach of the solid strata from the coal up to the surface, it will very probably prevent the crush from proceeding any farther in that part of the coalery. If the crush begins in the rise part of the coalery, it is more difficult to stop it from proceeding to the dip, than it is to stop it from going to the rise when it begins in a contrary part.

Another circumstance proper to be taken notice of is the foul or adulterated air so often troublesome in coaleries. Of this there are two kinds; the black damp or styth, which is of a suffocating nature; and the inflammable or combustible damp. Without staying to inquire, in this place, into the origin and effects of these damps, it may be sufficient to observe, that, in whatever part of any coalery a constant supply or a circulation of fresh air is wanting, there some of these damps exist, accumulate in a body, and become noxious or fatal; and whenever there is a good circulation of fresh air, they cannot accumulate, being mixed with and carried away by the stream of air as fast as they generate or exhale from the strata. Upon these principles are founded the several methods of ventilating a coalery. Suppose the workings of the pits A and B (fig. 6.) to be obnoxious to the inflammable damps; if the communication was open betwixt the two pits, the air which went down the pit A would proceed immediately along the mine a, and ascend out of the pit B; for it naturally takes the nearest direction, so that the air in all the workings would be stagnant; and they would be utterly inaccessible from the accumulation of the combustible damp. In order to expel this, the air must be made to circulate through all the different rooms by means of collateral air-courses made in this manner: The passage or mine a must be closed up or stopped by a partition of deals, or by a wall built with bricks or stones, to prevent the air passing that way. This building is called a *stopping*. There must also be stoppings made in the thirlings 1 1 1, &c. betwixt the pillars ff, &c. which will direct the air up the mine e e, until it arrives at the innermost thirling 2, which is to be left open for its passage. There must also be stoppings made at the side of the mine a at m m, and on both sides of the main headway BC at b b, &c. then returning to the innermost thirling 2, proceed to the third row of pillars, and build up the thirlings 2 2, &c. leaving open the thirling 3 for a passage for the air; and proceeding on to the fifth row of pillars, build up in the same manner the stoppings 3 3, &c. leaving open 4 for an air-course: and by proceeding in every other row of pillars, the current

¹⁹ Foul air.

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¹⁸ Of crushes and fits.

Coalery. rent of fresh air will circulate through and ventilate the whole workings, in the direction pointed to by the small arrows in the plan, clearing away all the damps and noxious vapours that may generate. When it is arrived at C, it is conducted across the main headway, and carried through the other part of the pit's workings in the same manner, until it returns through *nn* to the pit B, where it ascends; and as the rooms advance farther, other stoppings are regularly made.

In some of those stoppings, on the sides of the main headway, there must be doors to admit a passage for the bringing out of the coals from the rooms to the pit, as at *55*: these doors must be constantly shut, except at the time of passing through them.

There are other methods of disposing the stoppings so as to ventilate the pit; but none which will so effectually disperse the damps as that described above. If the damps are not very abundant, then the course of stopping *111*, &c. in the level mine, and the others at *bb*, &c. in the main headway, without any others, may perhaps be sufficient to keep the pit clear. If at any time the circulation of the fresh air is not brisk enough, then a large lamp of fire may be placed at the bottom of the pit B, which, by rarefying the air there, will make a quicker circulation.

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and ship-
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coals.

Most of the larger coaleries send their coals to the ships for the coasting trade or exportation; and, as the quantity is generally very large, it would take a greater number of carts than could conveniently be obtained at all times to carry them; besides the considerable expence of that manner of carriage: they therefore generally use waggons, for carrying them along waggon-ways, laid with timber, by which means one horse will draw from two to three tons at a time, when in a cart not above half a ton could be drawn.

The first thing to be done in making a waggon-way is to level the ground in such a manner as to take off all sudden ascents and descents, to effect which, it is sometimes necessary to cut through hills, and to raise an embankment to carry the road through hollows. The road should be formed about 12 feet wide, and no part should have a greater descent than of one yard perpendicular in 10 of a horizontal line, nor a greater ascent than one yard in 30. After the road is formed pieces of timber, about six feet long and six inches diameter, called *sleepers*, are laid across it, being 18 or 24 inches distant from each other. Upon these sleepers other pieces of timber, called *rails*, of four or five inches square, are laid in a lateral direction, four feet distant from each other, for the waggon-wheels to run upon; which being firmly pinned to the sleepers, the road may then be filled with gravel and finished.

The waggons have four wheels, either made of solid wood or of cast iron. The body of the carriage is longer and wider at the top than at the bottom; and usually has a kind of trap-door at the bottom, which, being loosed, permits the coals to run out without any trouble. The size of a waggon to carry 50 hundred weight of coals is as follows:

	Fect.	Inch s.
Length of the top,	7	9
Breadth of the top,	5	0
Length of the bottom,	5	0
Breadth of the bottom,	2	6
Perpendicular height,	4	3

Where the pits are situated at some considerable distance from the harbour, it becomes necessary to have a store-house near the shipping place, where the coals may be lodged, until the lighters or ships are ready to take them in. The waggon-way should be made into the store-house, at such a height from the ground, as to permit the coals to run from the waggons down a spout into the vessels; or else to fall down into the store-house, as occasion may require.

This kind of store-house is well adapted to dispatch and saving expence; for a waggon-load of coals may be delivered either into the store-house or vessels instantly with very little trouble: and if the coals were exposed to the effects of the sun and rain, they would be greatly injured in their quality; but being lodged under cover of the store-house, they are preserved.

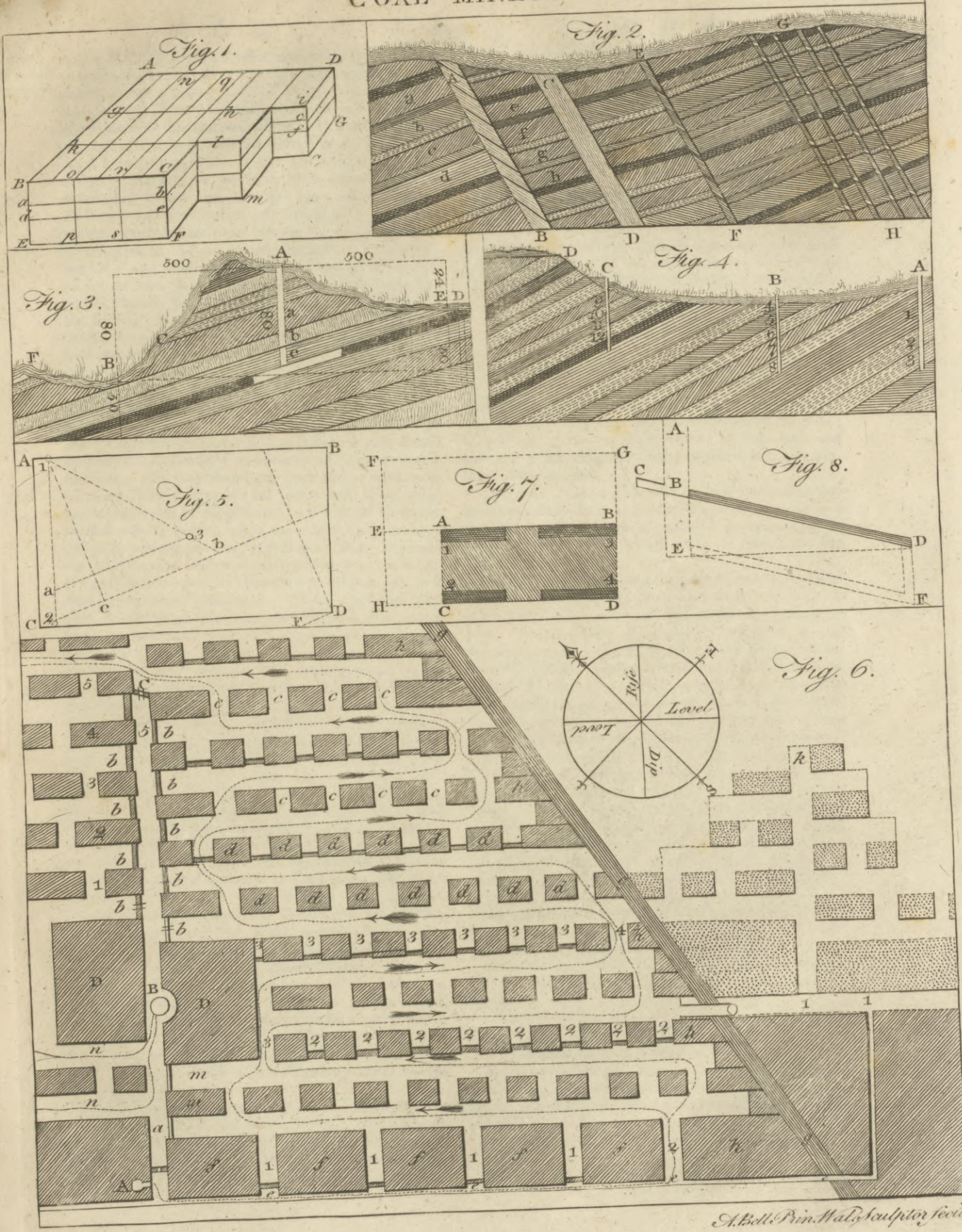
COALESCENCE, the union or growing together of two bodies before separate. It is principally applied to some bones in the body, which are separate during infancy, but afterwards grow together; or to some morbid union of parts, which should naturally be distinct from each other. Thus there is a coalescence of the sides of the vulva, anus, and nares; of the eye lids, fingers, toes, and many other parts.

COALLIER, a vessel employed to carry coals from one port to another, chiefly from the northern parts of England to the capital, and more southerly parts, as well as to foreign markets. This trade is known to be an excellent nursery for seamen, although they are often found, from the constitution of their climate, not to be so well calculated for southern navigation.

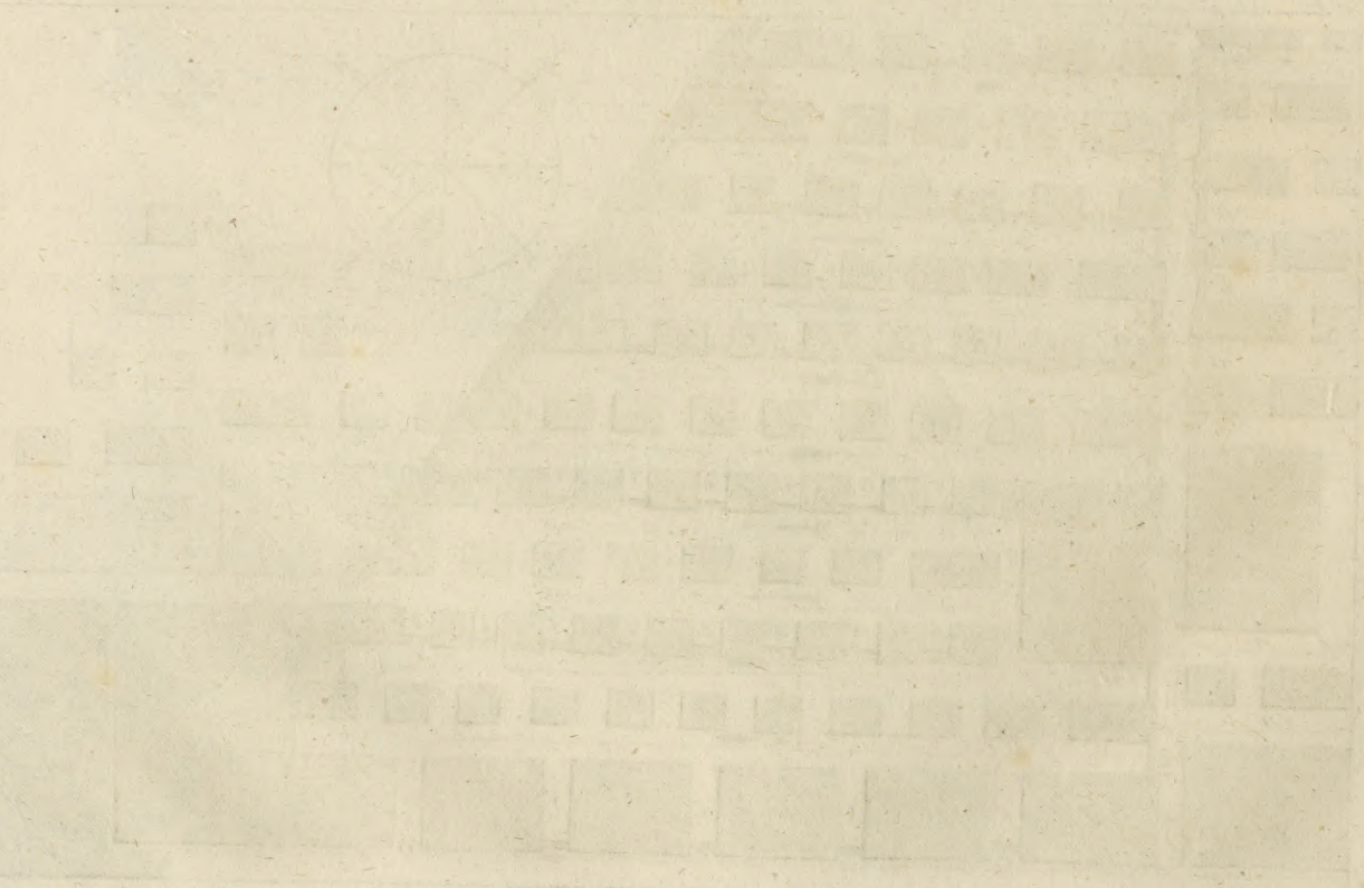
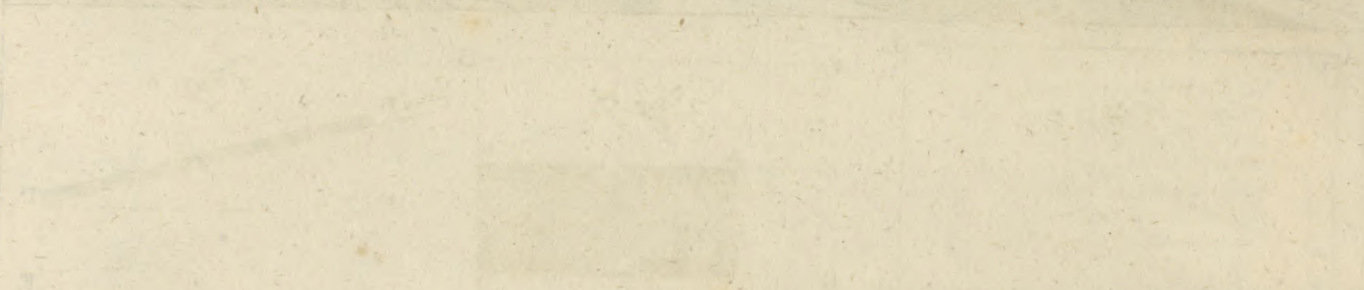
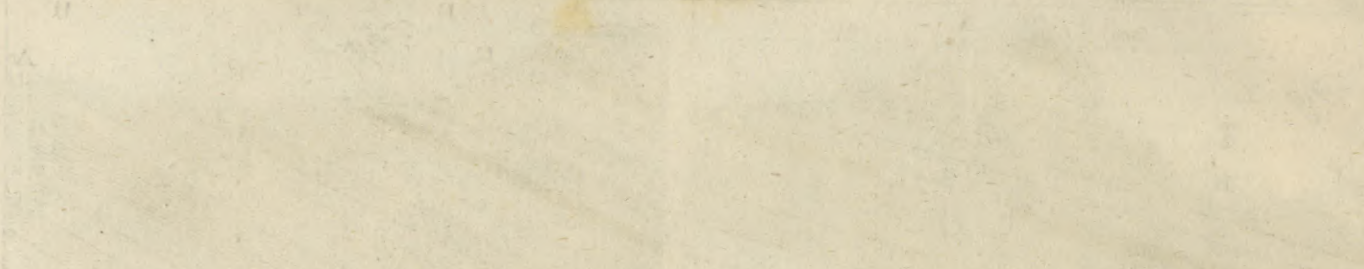
COAMINGS, in ship-building, are those planks, or that frame, forming a border round the hatches, which raise them up higher than the rest of the deck. Loop-holes for muskets to shoot out at are often made in the coamings, in order to clear the deck of the enemy when the ship is boarded.

COANE, among the Greeks, a name given to a peculiar species of *tutia* or tatty, which was always found in a tubular form. It had its name from *κων*, a word used to express a sort of cylindric tube, into which the melted brass was received from the furnace, and in which it was suffered to cool. In cooling, it always deposited a sort ofcrement on the sides of the vessel or tube, and this was the tatty called coane.

COAST, a sea-shore, or the country adjoining to the edge of the sea. Dr Campbell, in his political survey of Great Britain, considers an extensive sea-coast as of great advantage to any kingdom; and consequently that this island hath many conveniences resulting from the extent of its coasts, superior to other kingdoms which are much larger. The chief advantages arising from an extensive sea-coast are, that thus there is a convenient opportunity for exportation and importation to or from all parts of the kingdom. Thus, a number of cities are formed on the coasts; by this means the internal parts are improved, &c. The extent of the sea-coasts of Arabia, he looks upon as the genuine source of wealth and splendour to the ancient inhabitants of that peninsula; the same was the instrument of the greatness of ancient Egypt, of Phœnicia, &c. In short, according to him, no country or city can for any length of time be flourishing unless



A. Bell Pin. Malt. Sculptor fecit.



Coast, unless it hath a considerable connexion with the sea. Cape-Coast. "It is indeed true (says he) that the wisdom and industry of man, taking hold of some peculiar circumstances, may have rendered a few inland cities and countries very fair and flourishing. In ancient history we read of Palmyra, and the district round it, becoming a luxuriant paradise in the midst of inhospitable deserts. But this was no more than temporary grandeur; and it has now lain for some ages in ruins. The city and principality of Candahar was in like manner rendered rich and famous, in consequence of its being made the centre of the Indian commerce; but long ago declining, its destruction has been completed in our days, from that dreadful desolation which Thamas Kouli Khan spread through Persia and the Indies. Here, in Europe, many of the large cities in Germany, which for a time made a great figure from the freedom and industry of the inhabitants, and diffused ease, plenty, and prosperity, through the districts dependent on them, which of course rendered them populous, are now so much sunk through inevitable accidents, as to be but shadows of what they were; and though they still continue to subsist, subsist only as the melancholy monuments of their own misfortunes. We may therefore, from hence, with great certainty discern, that all the pains and labour that can be bestowed in supplying the defect of situation, in this respect, proves, upon the whole, but a tedious, difficult, and precarious expedient. But, however, we must at the same time admit, that it is not barely the possession even of an extended coast that can produce all these desirable effects. That coast must likewise be distinguished by other natural advantages, such as capes and promontories, favourably disposed to break the fury of the winds; deep bays, safe roads, and convenient harbours. For, without these, an extended coast is no more than a maritime barrier against the maritime force of other nations; as is the case in many parts of Europe, and is one of the principal reasons why Africa derives so little benefit from a situation which has so promising an appearance; there being many considerable tracts upon its coasts equally void of havens and inhabitants, and which afford not the smallest encouragement to the attempting any thing that might alter their present desolate condition. It is, however, a less inconvenience, and in some cases, no inconvenience at all, if, in the compass of a very extended coast, there should be some parts difficult or dangerous of access, provided they are not altogether inaccessible.—The sea coast of Britain, from the figure, in some measure, of the island, but chiefly from the inlets of the sea, and the very irregular indented line which forms its shore, comprehends, allowing for those sinuosities, at least 800 marine leagues: we may, from hence, therefore, with safety affirm, that in this respect it is superior to France, though that be a much larger country; and equal to Spain and Portugal in this circumstance, though Britain is not half the size of that noble peninsula, which is also singularly happy in this very particular."

CAPE-COAST, the name of the chief British settlement on the coast of Guinea in Africa. The name is thought to be a corruption of *Cabo Corso*, the ancient Portuguese appellation. This cape is formed by an angular point, washed on the south and east by the

sea, on which stands the English fort. Here the Portuguese settled in 1610, and built the citadel of Cape-Coast upon a large rock that projects into the sea. A few years afterwards they were dislodged by the Dutch, to whom this place is principally indebted for its strength. In 1664 it was demolished by Admiral Holmes, and in 1665 the famous Dutch admiral De Ruyter was ordered by the States to revenge the insults of the English. With a squadron of 13 men of war, he attacked all the English settlements along the coast; ruined the factories; and took, burnt, and sunk all the shipping of the English Company: however, after all his efforts, he was baffled in his attempts on Cape Coast. By the treaty of Breda it was confirmed to the English, and the king granted a new charter in 1672; on which the Company applied all their attention to the fortifying and rendering it commodious.

COASTING, in *Navigation*, the act of making a progress along the sea-coast of any country. The principal articles relating to this part of navigation are, the observing the time and direction of the tide; knowledge of the reigning winds; of the roads and havens; of the different depths of the water, and qualities of the ground.

COASTING Pilot, a pilot who by long experience has become sufficiently acquainted with the nature of any particular coast, and of the requisites mentioned in the preceding article, to conduct a ship or fleet from one part of it to another.

COAT, or COAT of ARMS, in *Heraldry*, a habit worn by the ancient knights over their arms both in war and tournaments, and still borne by heralds at arms. It was a kind of fur-coat, reaching as low as the navel, open at the sides, with short sleeves, sometimes furred with ermine and hair, upon which were applied the armories of the knights embroidered in gold and silver, and enamelled with beaten tin coloured black, green, red, and blue; whence the rule never to apply colour on colour, nor metal on metal. The coats of arms were frequently open, and diversified with bands and fillets of several colours, alternately placed, as we still see cloths scarleted, watered, &c. Hence they were called *devises*, as being divided and composed of several pieces sewed together; whence the words *fess*, *pale*, *chevron*, *bend*, *cross*, *saltier*, *lozenge*, &c. which have since become honourable pieces, or ordinaries of the shield. See CROSS, BEND, CHEVRON, &c.

Coats of arms and banners were never allowed to be worn by any but knights and ancient nobles.

COAT, in *Anatomy*. See TUNIC and EYE.

COAT of Mail; a kind of armour made in form of a shirt; consisting of iron rings wove together netwise. See MAIL.

COATI, in *Zoology*, a synonyme of a species of VIVERRA and URSUS. See MAMMALIA Index.

COATIMUNDI, a variety of the above.

COATING of Phials, *Panes of Glass*, &c. among electricians, is usually performed by covering the outside of the phial with tinfoil, brass or gold-leaf, &c. and filling its inside with loose pieces of brass-leaf, by which means it becomes capable of being charged. See ELECTRICITY.

COATZONTECOXOCHITL, or *Flower with the*

Coasting
||
Coatzontecoxochitl.

Cobalt
||
Coboofe.

the viper's head, is the Mexican name of a flower of incomparable beauty. It is composed of five petals or leaves, purple in the innermost part, white in the middle, the rest red but elegantly stained with yellow and white spots. The plant which bears it has leaves resembling those of the iris, but longer and larger; its trunk is small and slim: This flower was one of the most esteemed among the Mexicans. The Lincean academicians of Rome, who commented on and published the History of Hernandez in 1651, and saw the paintings of this flower, with its colours, executed in Mexico, conceived such an idea of its beauty, that they adopted it as the emblem of their very learned academy, denominating it *Fior di Lince*.

COBALT, a metallic substance which was formerly classed with the semimetals. See CHEMISTRY and MINERALOGY *Index*.

COBBING, a punishment sometimes inflicted at sea. It is performed by striking the offender a certain number of times on the breech with a flat piece of wood called the *cobbing-board*. It is chiefly used as a punishment to those who quit their station during the period of the night-watch.

COBITIS, the LOACHE, in *Ichthyology*, a genus of fishes belonging to the order of abdominales. See ICHTHYOLOGY *Index*. It is frequent in the stream near Amesbury in Wiltshire, where the sportsmen, through frolic, swallow it down alive in a glass of white-wine.

COBLE, a boat used in the turbot fishery, twenty feet six inches long, and five feet broad. It is about one ton burthen, rowed with three pair of oars, and admirably constructed for encountering a mountainous sea.

COBLENTZ, an ancient, handsome, and strong town of Germany, in the electorate of Triers or Treves, seated at the confluence of the rivers Rhine and Moselle, in a fertile country, with mountains covered with vineyards. It is the usual residence of the elector of Treves, to whom it belongs. Over the Rhine is a bridge of twelve arches, built for the convenience of the inhabitants of Coblentz and the adjacent places. A ferry machine is constantly going from the city to the other side of the Rhine, where there is a little town and very strong castle built on an eminence named *the rock of honour*. This machine is erected on two boats, in the form of a large square gallery, encompassed with ballustrades, and carries a tall flag-staff, on which are displayed the arms of the electorate of Treves. It is put in motion by the ferry-man's pulling a rope, which is fixed to a standard on each side the river. The castle appears to be almost inaccessible to an enemy, and entirely commands the city of Coblentz. The archbishop's palace stands at the foot of this rock, and the arsenal at a little distance. E. Long. 7. 32. N. Lat. 50. 24.

COBOB, the name of a dish among the Moors. It is made of several pieces of mutton wrapt up in the cawl, and afterwards roasted in it; the poorer people, instead of the meat, use the heart, liver, and other parts of the entrails, and make a good dish, though not equal to the former.

COBOOSE, in sea-language, is derived from the Dutch *kambuis*, and denotes a sort of box, resembling a sentry-box, used to cover the chimneys of some mer-

chant ships. It generally stands against the barricade, on the fore-part of the quarter deck. It is called in the West Indies *cobre vega*.

Coburg
||
Cochin.

COBURG, a town of Germany in the circle of Franconia, and capital of a territory of the same name, with a famous college, a fort, and a castle. This town, with its principality, belongs to the house of Saxony, and the inhabitants are Protestants. It is seated on the river Itch, in E. Long. 11. 18. N. Lat. 50. 22.

COBWEB, in *Physiology*, the fine net-work which spiders spin out of their own bowels, in order to catch their prey. See ARANEA.

COCCEIUS, JOHN, professor of theology at Bremen, was founder of a sect called *Cocceians*: they held, amongst other singular opinions, that of a visible reign of Christ in this world, after a general conversion of the Jews and all other people to the true Christian faith, as laid down in the voluminous works of Cocceius. He died in 1699, aged 66.

COCCINELLA, in *Zoology*, a genus of insects of the order of coleoptera. See ENTOMOLOGY *Index*.

COCCOLOBO, in *Botany*: A genus of the trigynia order, belonging to the octandria class of plants; and in the natural method ranking under the 12th order, *Holoraccæ*. See BOTANY *Index*.

COCCOTHAUSTES, the trivial name of a species of LOXIA. See ORNITHOLOGY *Index*.

COCCULUS INDICUS, the name of a poisonous berry, too frequently mixed with malt-liquors in order to make them intoxicating; but this practice is expressly forbidden by act of parliament. It is the fruit of the *MENISPERMUM Coccus*. Fishermen have a way of mixing it with paste, which the fish swallow greedily, and are thereby rendered lifeless for a time, and float on the water. It is sometimes used with stavesacre, for destroying vermine in children's heads.

COCCUS, in *Zoology*, a genus of insects belonging to the order of hemiptera. See ENTOMOLOGY *Index*.

COCCYGÆUS MUSCULUS. See ANATOMY, Table of the Muscles.

COCCYX, or COCCYGIS OS. See ANATOMY *Index*.

COCHIN, a Dutch settlement on the coast of Malabar, in N. Lat. 10. 0. E. Long. 75. 30. The town is not unpleasant, though it falls far short of their settlement at Columbo in the island of Ceylon. The fortification is irregular, but strong enough to resist any of the Indian powers, and has 40 or 50 cannon facing the sea. The people in this town and the country adjacent are subject to a strange disorder of the legs, called *Cochin* or *elephant legs*, in which the swelled limb is sometimes of such an enormous bulk as to have greatly the appearance both in shape and size of the leg of an elephant. According to Mr Ives, this disorder seems to be merely an œdematous swelling, occasioned by an impoverished state of the blood and juices. The persons afflicted with this distemper very seldom apply to European surgeons, and thus are rarely, if ever, cured. Indeed, our author observes, that their application would probably be of little avail, as the only thing that could be prescribed would be an alteration from the poorest to the most cordial and nutritious diet; and the Indians are so invincibly wedded to their own customs, that they would sooner die than break through them. Of this he says there were several

Cochin-
China.

several instances in their long passage to Bengal, during which some of the Sepoys perished for want of food, rather than save themselves by partaking of the ship's provisions after their own had been expended. Most of those afflicted with the disorder we speak of, are unable to call any assistance, being the very poorest of the people, who live entirely upon a kind of fish called *sardinias*, without being able to purchase even the smallest quantity of rice to eat along with it; their drink is also mere water, unless they sometimes procure a draught of the simple unfermented juice called *toddy*. Cochin is the principal place from whence the Dutch import their pepper into Europe.

COCHIN-CHINA, a kingdom of Asia, bounded on the north by Tonquin; on the east, by the sea of China; on the south by the Indian ocean; and on the west, by Cambodia, and a ridge of mountains inhabited by a savage people called *Kemois*, who live independent of any government. Little of the history of this kingdom is known. M. le Poivre, a French traveller, informs us, that about half a century before the French first arrived in these distant regions, a prince of Tonquin, as he fled from his sovereign, by whom he was pursued as a rebel, had with his soldiers and adherents crossed the river, which serves as a barrier between Tonquin and Cochin-China. The fugitives, who were warlike and civilized men, soon expelled the scattered inhabitants, who wandered about without any society or form of government, and founded a new kingdom, which soon grew rich and populous. During the reigns of the first six kings, no nation could be happier than the Cochin-Chinese. Their monarchs governed them as a father does his family, establishing no laws but those of nature, to which they themselves were the first to pay obedience. They honoured and encouraged agriculture, as the most useful employment of mankind; and required from their subjects only a small annual free-gift to defray the expence of their defensive war against the Tonquinese, who were their enemies. This imposition was regulated, by way of poll-tax, with the greatest equity. Every man, able to till the ground, paid in to the prince a small sum proportioned to the strength of his constitution, and the vigour of his arm, and nothing more.

Cochin-China continued happy under these princes for more than a century; but the discovery of gold-mines put a stop to the above mild regulations. Luxury immediately took place. The prince began to despise the simple habitation of his ancestors, and caused a superb palace to be built a league in circumference, surrounded with a wall of brick in the model of that of Pekin, and defended by 1600 pieces of cannon. Not content with this, he would needs have a winter palace, an autumn palace, and a summer palace. The old taxes were by no means sufficient to defray these expences; new ones were devised; and oppression and tyranny everywhere took place. His courtiers, to flatter their prince, gave him the title of the *king of heaven*, which he still continues to assume. When speaking of his subjects, he styles them his *children*, but by no means behaves as if he was their father; for our author informs us, that he has seen whole villages newly abandoned by their inhabitants, who were harassed with toil and insupportable exactions; the necessary consequence of which was,

that their lands returned to their former uncultivated state.

M. le Poivre represents the Cochin-Chinese as gentle, hospitable, frugal, and industrious. There is not a beggar in the country, and robbery and murder are absolutely unknown. A stranger may wander over the kingdom from one end to the other (the capital excepted) without meeting with the slightest insult. He will be everywhere received with the most eager curiosity, but at the same time with the greatest benevolence. A Cochin-Chinese traveller, who has not money sufficient to defray his expences at an inn, enters the first house of the town or village he arrives at, and waiting the hour of dinner, takes part with the family, and goes away when he thinks proper, without speaking a word, or any person's putting to him a single question.

The country of Cochin-China is much of the same temperature with that of Tonquin; though rather milder, as lying near the sea. Like Tonquin, it is annually overflowed, and consequently fruitful in rice, which requires no other manure than the mud left by the inundations. They have sugar-canes, and the same kinds of fruits common to other parts of India. The country produces no grapes, and therefore they drink a liquor brewed from rice. They have vast woods of mulberry-trees, which run up as fast as our hemp. Their silk is stronger than that of China, but not so fine. They have the best timber in the world, particularly a sort which abounds in the mountains, and is called the *incorruptible tree*, because it never rots under earth or water, and is so solid that it serves for anchors. There are two kinds, black and red. The trees are very tall, straight, and so big that two men can scarce grasp them. They have also on the mountains of the *Kemois* a tree of the most fragrant scent, which is supposed to be the same with lignum aloes. This, being reckoned the best product of the country, is engrossed by the king, and is sold from five to 16 ducats per pound. It is highly valued both in China and Japan, where the logs of it are sold for 200 ducats a pound, to make pillows for the king and nobility; and among those Indians which continue to burn their dead, great quantities of it are used in the funeral piles. The young trees called *aquila*, or eagle-wood, are every one's property, which makes the old ones called *calamba* so scarce and dear. They have oak, and large pines, for the building of ships, so that this country is of the same use to China that Norway is to Britain. In general, they have the same kind of trees and plants that are to be met with in Tonquin. They have mines of gold, as well as diamonds; but the last they do not value so high as pearl. They also esteem their coral and amber very much. In all the provinces there are great granaries filled with rice, in some of which that grain is kept upwards of 30 years. One of the greatest rarities of these parts, especially in grand entertainments, is a ragout made of the eatable birds nests, which some say are found only in Cochin-China, and others in four islands that lie south of its coast. See BIRDS-NESTS.

The merchants of Cambodia, Tonquin, China, Macao, Manila, Japan, and Malacca, trade to Cochin-China with plate, which they exchange for the commodities of the country. The Portuguese are the most favoured

Cochin-
China.

Cochin-
China.

favoured here of any Europeans. The Cochin-Chinese themselves, not being inclined to travel, seldom sail out of sight of their own shore, but purchase many trifles from foreigners at great rates, particularly combs, needles, bracelets, glass pendants, &c. They are very fond of our hats, caps, girdles, shirts, and other clothes; and, above all, set a great value on coral. The country is said to have 700 miles of coast, with many large inlets of the sea, and above 60 convenient landing places; which, however, according to Captain Hamilton, are but seldom visited by strangers.

The people of this country have a great affinity with those of Tonquin, with whom they have a common origin, and from whom they differ very little in their manner of living, as well as their manners and customs, all of which they have in a great measure borrowed from the Chinese. The principal exports of the country are silk, sugar, ebony, and calamba-wood; gold in dust or in bars, which is sold for only ten times its weight in silver; and copper and porcelain brought from China and Japan. From this country also are exported the birds-nests esteemed such a delicacy at the table. They are found in four islands situated near the coasts of Cochin-China, to the eastward of which are five other smaller ones, where are found prodigious numbers of turtles, the flesh of which is so delicate that the Tonquinese and people of Cochin China frequently fight desperate battles, in order to take them from one another. The commodities which sell most readily in this country are, saltpetre, sulphur, lead, fine cloth, and barred or flowered chintz. Pearls, amber, and coral, were formerly in great request, but at present only the two last are saleable; and even these will not answer unless the beads of coral be round, well polished, and of a beautiful red colour; the amber must also be extremely clear, the beads of an equal size, and not larger than a hazel nut.

The only money current in Cochin-China is that of Japan, which is paid and received by weight. The money of the country is of copper, and as large as our counters; of a round figure, and having a hole in the middle by which the pieces may be strung like beads. Three hundred of these are put on one side and as many on the other, which in Cochin-China pass for a thousand; because in 600 are found ten times 60, which make a century among almost all the people of the east. There is, however, scarce any country in which merchants are more apt to be deceived with regard to the value of money than Cochin-China, owing to the pieces being unequal in figure and quality, and the difficulty of determining their value, which is regulated only by a few characters stamped upon them. The dealers must therefore be at pains to have honest and skilful people to ascertain the value of the pieces they receive, otherwise they run a great risk of being deceived in their value, as the Cochin-Chinese make a great merit of being able to cheat an European.

European merchants complain, according to M. Grosier, unjustly of the demands made in Cochin-China for entrance, clearance, and anchorage. The duties, indeed are very trifling, amounting only, even those of the customhouse, to 4 per cent; but nothing can be removed from a ship which arrives there until

she has first been inspected, when the customhouse officers unload her, weigh and count the smallest pieces, and generally take what they look upon to be most valuable, in order to send it to the king. The monarch takes what he thinks proper, and returns the value; but the grandees are said to keep part of the goods also, without paying any thing for them. Thus the ordinary goods, which, had they been accompanied with the more valuable part of the cargo, would have found a ready market, can now scarcely be disposed of; though our author is of opinion, that the matter is not altogether without remedy. When the Dutch sent to this country, vessels loaded with cloths, lead, and saltpetre, their cargoes were suffered to remain entire, because they had taken the precaution to pay every year a certain sum for each vessel that entered. Other nations, by endeavouring to avoid the payment of this duty, entirely destroyed their commerce: the people of Cochin-China, however, for some years past, have been much more moderate in their demands; and whatever their exactions may be, they are far less exorbitant than those of the Tonquinese.

M. Grosier observes, that a false report has gained ground in Europe, that when a trading vessel happens to run aground in Cochin-China, or to be driven into any of its harbours by stress of weather, the king seizes the cargo if the rudder be broken. He assures us, however, that, so far from this being the case, a vessel in distress is much safer on the coasts of Cochin-China than almost anywhere else. Barks are immediately sent to the relief of the crew, and people employed to drag the sea with nets in order to recover the goods that are lost; and, in short, neither labour nor expences are spared to put the ships in the best condition possible. Only two things can hurt the trade of foreigners at Cochin-China, one of which may be easily avoided. This regards the clearing out of vessels. Thus, while the master is waiting on the evening before his departure, or on the day fixed for sailing, in order to receive his dispatches, it often happens that he loses his voyage, which may prove the ruin of a trader. For this reason, care must be taken to solicit a clearance a month before; by which means one is always certain of obtaining it, and departing on the day appointed. The other difficulty is occasioned by the necessity of selling goods on credit, which are seldom paid at the stipulated time. This however, is contrary to the inclination of the prince; for every merchant who can convey to him an account of these unjust delays, is sure to be paid, and sometimes even with interest.

COCHINEAL, or COCHINEEL, a drug used by the dyers, &c. for giving red colours, especially crimsons and scarlets, and for making carmine; and likewise in medicine as a cardiac, cordial, sudorific, alexipharmac, and febrifuge.

The cochineal, in the state in which it is brought to us, is in small bodies of an irregular figure, usually convex, ridged and furrowed on one side, and concave on the other. The colour of the best is a purplish gray, powdered over with a sort of white dust. All that the world knew of it for a long time was, that it was gathered from certain plants in Mexico; and therefore it was naturally supposed to be a seed, till in the year 1692 Father Plumier gave Pomet an account

Cochin-
China,
Cochineal.

Cochlea
||
Cock-Pit.

count of its being an animal. And this, though then disregarded, has been confirmed by subsequent observations. Indeed, to determine the point, we have now the means in our own hands, even in this part of the world.—We need only moisten and soak in water, or in vinegar, a number of cochineals till they are swelled and distended, to know that every one is the more or less perfect body of an insect; the most imperfect and mutilated specimens always show the rings of the body; and from observing others, it will be easy to find the number and disposition of the legs, parts, or even whole ones, being left on several, and often complete pairs. In this way the legs, antennæ, and proboscis, may be discovered. See *Coccus* above.

M. Macquer observes, that the cochineal of Sylvester is gathered in the woods of Old and New Mexico. The insect lives, grows, and multiplies on the uncultivated opuntias, which grow there in great abundance. It is there exposed to the inclemencies of the weather, and dies naturally. The colour is more durable than that of the common cochineal, but less bright: but there is no advantage in using it; for, though cheaper, a greater quantity is requisite.

COCHLEA, the SHELL SNAIL. See *HELIX*, CONCHOLOGY Index.

COCHLEA, in *Anatomy*. See *ANATOMY* Index.

COCHLEARIA, SCURVY GRASS. See *BOTANY* Index.

COCHLITES, in *Natural History*, an appellation given to the petrified shells of the cochleæ or snails.

COCINTUM, in *Ancient Geography*, a promontory of the Bruttii, reckoned the longest in Italy, and which Holstenius and Vossius have restored to Ovid, reading *Cocintia* for *Ceurania*, Metam. xv. v. 704.—*Cocintum*, also a town, 22 miles to the south of Scylaceum, almost on the spot where now *Stilo* stands, from which the opposite promontory *Cocintum* is commonly called *Capo de Stilo*.

COCK, in *Zoology*, the English name of the males of gallinaceous birds, but more especially used for the common dunghill cock. See *PHASIANUS*, ORNITHOLOGY Index.

Black Cock. } See *TETRAO*, ORNITHOLOGY Index.
Cock of the Wood. } *des.*

Cock-Chaffer. See *SCARABÆUS*, ENTOMOLOGY Index.

Cock-Paddle, Lump-fish or Sea-owl. See *CYCLOP-TERUS*, ICHTHYOLOGY Index.

Cock-Pit, a sort of theatre upon which game-cocks fight.

It must appear astonishing to every reflecting mind, that a mode of diversion so cruel and inhuman as that of cock-fighting should so generally prevail, that not only the ancients, barbarians, Greeks, and Romans, should have adopted it; but that a practice so savage and heathenish should be continued by Christians of all sorts, and even pursued in these better and more enlightened times.

The ancient Greeks and Romans, as is well known, were wont to call all the nations in the world barbarians; yet certainly, if we consider the many instances of cruelty practised among them, there was very little reason for the distinction. Human sacrifices were common both to them and the barbarians; and with them

the exposing of infants, the combats of men with wild beasts, and of men with men in the gladiatorial scenes, were spectacles of delight and festivity.

The islanders of Delos, it seems, were great lovers of cock-fighting; and Tanagra a city in Bœotia, the isle of Rhodes, Chalcis in Eubœa, and the country of Media, were famous for their generous and magnanimous race of chickens. The kingdom of Persia was probably included in the last, from whence this kind of poultry was first brought into Greece; and if one may judge of the rest from the fowls of Rhodes and Media, the excellency of the broods at that time consisted in their weight and largeness (as the fowls of those countries were heavy and bulky,) and of the nature of what our sportsmen call *shakebags* or *turnpokes*. The Greeks, moreover, had some method of preparing the birds for battle, by feeding; as may be collected from Columella.

It should seem, that at first cock fighting was partly a religious and partly a political institution at Athens; and was there continued for the purpose of improving the feeds of valour in the minds of their youth; but was afterwards abused and perverted both here and in the other parts of Greece to a common pastime, without any moral, political, or religious intention, and as it is now followed and practised among us.

At Rome, as the Romans were prone to imitate the Greeks, we may expect to find them following their example in this mode of diversion, and in the worst way, viz. without any good or laudable motives, since when they took and brought it to Rome, the Greeks had forgotten every thing that was commendable in it, and had already perverted it to a low and unmeaning sport. Signior Hyam thinks the Romans borrowed the pastime from Dardanus, in Asia; but there is little reason for making them go so far for it, when it was so generally followed in Greece, whose customs the Romans were addicted to borrow and imitate. However, it is probable, they did not adopt this opinion very early. It may be gathered from Columella, that the Romans did not use the sport in his time. This author styles cock-fighting a *Grecian diversion*; and speaks of it in terms of ignominy, as an expensive amusement, unbecoming the frugal householder, and often attended with the ruin of the parties that followed it. The words are remarkable. “Nos enim censemus instituire vestigal industrii patris familias, non rixosarum avium lanitæ, cujus plerumque totum patrimonium pignus aleæ, victor gallinæcus pyctes abstulit:” When he describes, as we think, the manner, not of the Romans, but of the Greeks, who had in his time converted the diversion of cock-fighting into a species of gaming, and even to the total ruin of their families, as happens but too often in England at this day. The Romans, however, at last gave into the custom, though not till the decline of the empire. The first cause of contention between the two brothers Bassianus and Geta, sons of the emperor Septimus Severus, happened, according to Herodian, in their youth, about the fighting of their cocks; and if the battling between these two princes was the first instance of it, probably they had seen and learned it in Greece, whither they had often accompanied the emperor their father.

It is observable, that cocks and quails pitted for the purpose

Cock-Pit. purpose of engaging one another, à outrance, or to the last gasp, for diversion, are frequently compared, and with much propriety, to gladiators. Hence Pliny's expression, *Gallorum—ceu gladiatorum*; and that of Columella, *rixosorum avium lanista*; *lanista* being the proper term for the master of the gladiators. Consequently one would expect, that when the bloody scenes of the amphitheatre were discarded, as they were soon after the Christian religion became the establishment of the empire, the wanton shedding of men's blood in sport, being of too cruel and savage a nature to be patronized and encouraged in an institution so harmless and innocent as the Christian was, one might justly expect that the *ορτυγομανια* and the *αλεκτρομανια* would have ceased of course. The fathers of the church are continually inveighing against the spectacles of the arena, and upbraiding their adversaries with them. These indeed were more unnatural and shocking than a main of cocks; but this, however, had a tendency towards infusing the like ferocity and implacability in the breasts and dispositions of men.

Besides, this mode of diversion has been in fact the bane and destruction of thousands here, as well as of those *lanista avium*, "cock-feeders," mentioned by Columella, whose patrimonial fortunes were totally dissipated and destroyed by it.

The cock is not only an useful animal, but stately in his figure, and magnificent in his plumage. "*Imperitant suo generi*, says Pliny, *et regnum* in quacunque sunt domo, *exercent.*" Aristophanes compares him to the king of Persia; most authors also take notice of the "spectatissimum insigne, ferratum, quod eorum verticem regia corona modo exornat." His tenderness towards his brood is such, that, contrary to the custom of many other males, he will scratch and provide for them with an assiduity almost equal to that of the hen; and his generosity is so great, that, on finding a board of meat, he will chuckle the hens together, and without touching one bit himself will relinquish the whole of it to them. He was called *the bird*, κατ' εζοχην, by many of the ancients; he was highly esteemed in some countries, and in others was even held sacred, inasmuch that one cannot but regret that a creature so useful and noble, should, by a strange fatality, be so enormously abused by us. It is true, our *αλεκτρομανια*, or the massacre of Shrove Tuesday, is now in a declining way; and, in a few years, it is to be hoped, will be totally disused; but the cock-pit still continues a reproach to the humanity of Englishmen, and to their religion; the purest, the tenderest and most compassionate, of all others, not excepting even the Brachmannic.

It is unknown when the pitched battle first entered England, but it was probably brought thither by the Romans. The bird was here before Cæsar's arrival, but no notice of his fighting occurs earlier than the time of William Fitz-Stephen, who wrote the life of Archbishop Becket, some time in the reign of Henry II. and describes the cocking as a sport of school boys on Shrove Tuesday. From this time at least the diversion, however absurd, and even impious, was continued amongst us. It was followed, though disapproved and prohibited, 39 Edward III.; also in the reign of Henry VIII. and A. D. 1569. It has by some been

called a *royal diversion*; and, as every one knows, the **Cock-Pit,** cock-pit at Whitehall was erected by a crowned head, **Cockburne.** for the more magnificent celebration of it. There was another pit in Drury-lane, and another in Javin-street. It was prohibited, however, by one of Oliver's acts, March 31. 1664. What aggravates the reproach and disgrace upon Englishmen, are those species of fighting which are called the *battle-royal* and the *Welsh-main*, known nowhere in the world but there; neither in China, nor in Persia, nor in Malacca, nor among the savage tribes in America. These are scenes so bloody as almost to be too shocking to relate; and yet, as many may not be acquainted with the horrible nature of them, it may be proper for the excitement of our aversion and detestation to describe them in a few words. In the former, an unlimited number of fowls are pitted, and when they have slaughtered one another for the diversion (*Dii boni!*) of the otherwise generous and humane Englishman, the single surviving bird is to be esteemed the victor, and carries away the prize. The *Welsh-main* consists we will suppose of 16 pairs of cocks; of these, the 16 conquerors are pitted a second time; the 8 conquerors of these are pitted a third time; the 4 conquerors the fourth time; and lastly, the two conquerors of these are pitted the fifth time: so that (incredible barbarity) 31 cocks are sure to be most inhumanly murdered for the sport and pleasure, the noise and nonsense, the profane cursing and swearing, of those who have the effrontery to call themselves, with all these bloody doings, and with all this impiety about them, *Christians*; nay, what with many is a superior and distinct character, men of benevolence and morality. But let the morality and benevolence of such be appreciated from the following instance recorded as authentic in the obituary of the Gentleman's Magazine for April 1789. "Died, April 4. at Tottenham, John Ardefoif, Esq; a young man of large fortune, and in the splendor of his carriages and horses rivalled by few country gentlemen. His table was that of hospitality, where it may be said he sacrificed too much to conviviality; but if he had his foibles, he had his merits also that far outweighed them. Mr Ardefoif was very fond of cock-fighting, and had a favourite cock upon which he had won many profitable matches. The last bet he laid upon this cock he lost; which so enraged him, that he had the bird tied to a spit and roasted alive before a large fire. The screams of the miserable animal were so affecting, that some gentlemen who were present attempted to interfere, which so enraged Mr Ardefoif, that he seized a poker, and with the most furious vehemence declared, that he would kill the first man who interposed; but, in the midst of his passionate asseverations, he fell down dead upon the spot. Such, we are assured, were the circumstances which attended the death of this great pillar of humanity."

COCK PIT, of a ship of war, the apartment of the surgeon and his mates, being the place where the wounded men are dressed in time of battle, or otherwise. It is situated under the lower deck.

COCKBURN, MRS CATHARINE, a most accomplished lady and celebrated writer, was the daughter of Captain David Trotter, a native of Scotland, and a sea-commander in the reign of King Charles II. She was born in London, August 16. 1679, and baptized in the

Cockburne. the Protestant church, according to which she was bred up. She gave early marks of her genius; and learned to write, and also made herself mistress of the French language, by her own application and diligence without any instructor; but she had some assistance in the study of the Latin grammar and logic, of which latter she drew up an abstract for her own use. The most serious and important subjects, and especially religion, soon engaged her attention.—But notwithstanding her education, her intimacy with several families of distinction of the Romish persuasion, exposed her, while very young, to impressions in favour of that church, which not being removed by her conferences with some eminent and learned members of the church of England, she embraced the Romish communion, in which she continued till the year 1707. In 1695 she produced a tragedy called *Agnes de Castro*, which was acted at the theatre-royal when she was only in her 17th year. The reputation of this performance, and the verses which she addressed to Mr Congreve upon his *Mourning Bride* in 1697, were probably the foundation of her acquaintance with that celebrated writer. Her second tragedy, *Fatal Friendship*, was acted in 1698, at the new theatre in Lincoln's-Inn Fields. This tragedy met with great applause, and is still thought the most perfect of her dramatic performances. Her dramatic talents not being confined to tragedy, she brought upon the stage, in 1701, a comedy called *Love at a loss*, or *Most votes carry it*. In the same year she gave the public her third tragedy, entitled the *Unhappy Penitent*, acted at the theatre royal in Drury-lane. But poetry and dramatic writing did not so far engross the thoughts of our author but that she sometimes turned them to subjects of a very different nature, and distinguished herself in an extraordinary manner in defence of Mr Locke's writings, a female metaphysician being a remarkable phenomenon in the republic of letters.

She returned to the exercise of her dramatic genius in 1703, and fixed upon the revolution of Sweden, under Guitavus Erickson, for the subject of a tragedy. This tragedy was acted in 1706, at the queen's theatre in the Hay-Market. In 1707, her doubts concerning the Romish religion, which she had so many years professed, having led her to a thorough examination of the grounds of it by consulting the best books on both sides of the question, and advising with men of the best judgment, the result was a conviction of the falseness of the pretensions of that church, and a return to that of England, to which she adhered during the remainder of her life. In 1708 she was married to the Rev. Mr Cockburne, then curate of St Dunstan's in Fleet-street, but he afterwards obtained the living of Long-Horsely, near Morpeth in Northumberland. He was a man of considerable abilities; and, among several other things, wrote an account of the Mosaic Deluge, which was much approved by the learned.

Mrs Cockburne's remarks upon some writers in the controversy concerning the foundation of moral duty and moral obligation, were introduced to the world in August 1743, in the *Literary Journal*, entitled *The History of the Works of the Learned*. The strength, clearness, and vivacity shown in her remarks upon the most abstract and perplexed questions, immediately raised the curiosity of all good judges about the conceal-

ed writer; and their admiration was greatly increased when her sex and advanced age were known. Dr Rutherford's *Essay on the Nature and Obligations of Virtue*, published in May 1744, soon engaged her thoughts; and notwithstanding the asthmatic disorder which had seized her many years before, and now left her small intervals of ease, she applied herself to the confutation of that elaborate discourse, and finished it with a spirit, elegance, and perspicuity equal, if not superior, to all her former writings.

The loss of her husband in 1748, in the 71st year of his age, was a severe shock to her; and she did not long survive him, dying on the 11th of May 1749, in her 71st year, after having long supported a painful disorder with a resignation to the Divine will, which had been the governing principle of her whole life, and her support under the various trials of it.

Her works are collected into two large volumes 8vo by Dr Birch, who has prefixed to them an account of her Life and Writings.

COCKERMOUTH, a town of Cumberland in England, situated in W. Long. 3. 12. N. Lat. 54. 35. It is a large town, irregularly built, with broad streets. It is washed by the Derwent on the western side; divided in two by the Cocker; and the parts are connected by a stone-bridge of a single arch. The number of inhabitants is between three and four thousand: the manufactures are shalloons, worsted stockings, and hats; the last exported from Glasgow to the West Indies. It is a borough-town, and the right of voting is vested by burgess tenure in certain houses: this is also the town where the county elections are held.—Here is a castle seated on an artificial mount on a bank above the Derwent. It is a square building, and strengthened with several square towers: on each side of the inner gate are two deep dungeons capable of holding 50 persons in either. They are vaulted at top, and have only a small opening in order to lower through it the unhappy victims into this dire prison; and on the outside of each is a narrow slit with a slope from it, down which were put the provisions allotted for the wretched inhabitants. This castle was founded by Waldof, first lord of Allerdale, and son of Godfrick earl of Northumberland, cotemporary with William the Conqueror. Waldof resided first at Pappcastle, which he afterwards demolished; and with the materials built that at Cockermouth, where he and his family long resided; but several arms over the gateway, which Camden says are those of the *Multons*, *Humfravilles*, *Lucies*, and *Percies*, evince it to have belonged in later times to those families. It appears that it was first granted by Edward II. to Anthony de Lucie, son of Thomas de Multon, who had assumed that name, because his mother was daughter and co-heiress to Richard de Lucie; and afterwards, by marriages, this castle and its honours descended to the Humfravilles, and finally to the Percies. In 1658, it was garrisoned for the king; and being besieged and taken by the rebels, was burnt, and never afterwards repaired.—Cockermouth is now in the possession of the Lowther family, who have here a great property in coal-works. The town sends two members to parliament.

COCKET, is a seal belonging to the king's custom-house,

Cockle
||
Cocles.

house, or rather a scroll of parchment sealed and delivered by the officers of the customs to merchants, as a warrant that their merchandises are customs.

It is also used for the office where goods transported were first entered, and paid their custom, and had a cocket or certificate of discharge.

COCKLE. See *CARDIUM*, *CONCHOLOGY* *Index*.

COCKLE, *Schorl*, or *Shirle*, in *Mineralogy*, a species of stones, belonging to the siliceous class. See *MINERALOGY* *Index*.

COCKNEY, a very ancient nickname for a citizen of London. Ray says, an interpretation of it is, A young person coaxed or cockered, made a wanton, or nestle-cock, delicately bred and brought up, so as when arrived at man's estate to be unable to bear the least hardship. Another, A person ignorant of the terms of country economy, such as a young citizen, who having been ridiculed for calling the neighing of a horse laughing, and told that it was called neighing, next morning, on hearing the cock crow, to show instruction was not thrown away upon him, exclaimed to his former instructor, How that cock neighs! whence the citizens of London have ever since been called cock-neighs, or cockneys. Whatever may be the origin of this term, we at least learn from the following verses, attributed to Hugh Bagot earl of Norfolk, that it was in use in the time of King Henry II.

Was I in my castle at Bungay,
Fast by the river Waveney,
I would not care for the king of Cockney.
(i. e. the king of London).

The king of the cockney occurs among the regulations for the sports and shows formerly held in the Middle Temple, on Childermas day, where he had his officers, a marshal, constable, butler, &c. See *Dugdale's Origines Juridicales*, p. 247.

COCKROACH. See *BLATTA*. In Captain Cook's last voyage, the ships, while at Huahine, were infested with incredible numbers of these creatures, whom it was found impossible by any means to destroy. Every kind of food, when exposed only for a few minutes, was covered with these noxious insects, and pierced so full of holes, that it resembled a honey-comb. They were particularly destructive to birds which had been stuffed for curiosities, and were so fond of ink, that they ate out the writing on labels. Books, however, were secured from their ravages by the closeness of the binding, which prevented them from getting in between the leaves. They were of two kinds, the *Blatta Orientalis*, and *Germanica*.

COCKSWAIN, or COCKSON, an officer on board a man of war, who hath the care of the boat, or sloop, and all things belonging to it. He is to be always ready with his boat's gang or crew, and to man the boat on all occasions. He sits in the stern of the boat, and steers; and hath a whistle to call and encourage his men.

COCLES. *PUB. HORATIUS*, a celebrated Roman, who alone opposed the whole army of Porsenna at the head of a bridge, while his companions behind him were cutting off the communication with the other shore. When the bridge was destroyed, Cocles though wounded by the darts of the enemy, leapt into the Tiber, and swam across it with his arms.

Cocoa
||
Codex.

A brazen statue was raised to him in the temple of Vulcan, by the consul Publicola, for his eminent services.

COCOA. See *COCOS*, *BOTANY* *Index*.

COCONATO, a town of Piedmont in Italy, famous for being the birth-place of Columbus, who first discovered America. E. Long. 8. o. N. Lat. 44. 50.

COCOS, in *Botany*; a genus belonging to the natural order of *Palmae*. See *BOTANY* *Index*.

COCTION, a general term for all alterations made in bodies by the application of fire or heat.

COCYTUS, one of the rivers of hell, according to the theology of the poets. It has its name *απο τῆς κλαυθῆς*, from groaning and lamenting. Hence Milton,

Cocytus nam'd of lamentation loud,
Heard on the rueful stream.

It was a branch of the river Styx; and flowed, according to Horace, with a dull and languid stream.

COD, in *Ichthyology*. See *GADUS* and *FISHERY*.

COD is also a term used, in some parts of the kingdom, for a pod. See *POD*.

Cod-Cape, a promontory on the coast of New England, near the entrance of Boston harbour. W. Long. 69. 50. N. Lat. 42. 0.

CODDY-MODDY, the English name of a species of *LARUS*.

CODE (*codex*), a collection of the laws and constitutions of the Roman emperors, made by order of Justinian. The word comes from the Latin *codex*, "a paper book;" so called *à codicibus*, or *caudicibus arborum*, "the trunks of trees;" the bark whereof being stripped off, served the ancients to write their books on.

The code is accounted the second volume of the civil law, and contains twelve books; the matter of which is nearly the same with that of the digests, especially the first eight books; but the style is neither so pure; nor the method so accurate, as that of the digests; and it determines matters of daily use, whereas the digests discuss the more abstruse and subtle questions of the law, giving the various opinions of the ancient lawyers. Although Justinian's code is distinguished by the appellation of *code*, by way of eminence, yet there were codes before his time: such were, 1. The Gregorian code, and Hermogenean code, collections of the Roman laws, made by two famous lawyers, Gregorius and Hermogenes, which included the constitutions of the emperors from Adrian to Dioclesian and Maximinus. 2. The Theodosian code, comprised in 16 books, formed out of the constitutions of the emperors from Constantine the Great to Theodosius the Younger: this was observed almost over all the west, till it was abrogated by the Justinian code. There are also several later codes, particularly the ancient Gothic, and those of the French kings; as the code of Euridic, code-Lewis, code-Henry, code-Marchande, code des Eaux, &c.; and the present king of Prussia has lately published a code, which comprises the laws of his kingdom in a very small volume.

CODEX, in antiquity, denotes a book or tablet on which the ancients wrote. See *CODE*.

CODEX also denoted a kind of punishment by means of a log or block of wood, to which slaves who had offended

Codia
||
Coecum.

fended were tied fast, and obliged to drag it along with them; and sometimes they sat on it closely bound.

CODIA, among botanists, signifies the head of any plant, but more particularly a poppy head; whence its syrup is called *diacodium*.

CODICIL, is a writing, by way of supplement to a will, when any thing is omitted that the testator would have added, or wants to be explained, altered, or recalled.

CODLIN, an apple useful in the kitchen, being the most proper for baking.

CODLING, an appellation given to the young cod-fish. See GADUS, ICHTHYOLOGY *Index*.

CODON (Κωδων), in antiquity, a cymbal, or rather little brass bell, resembling the head of a poppy. They were fastened to the trappings and bridles of horses.

CODRINGTON, CHRISTOPHER, a brave English officer, and not less distinguished for his learning and benevolence, was born at Barbadoes in the year 1668, and educated at Oxford; after which he betook himself to the army; and, by his merit and courage, soon recommending himself to the favour of King William, was made a captain in the first regiment of foot-guards. He was at the siege of Namur in 1695; and, upon the conclusion of the peace of Ryfwick, was made captain-general and governor in chief of the Leeward and Caribbee islands. However, in 1701, several articles were exhibited against him to the house of commons in England; to which he published a distinct and particular answer, and was honourably acquitted of all imputations. In 1703, he showed great bravery at the attack of Guadaloupe, but at last he resigned his government, and lived a studious retired life; for a few years before his death, he chiefly applied himself to church-history and metaphysics. He died at Barbadoes on the 7th of April 1710, and was buried there the day following; but his body was afterwards brought over to England, and interred, on the 19th of June 1716, in the chapel of All-Souls College, Oxford. By his last will, he bequeathed his plantations in Barbadoes, and part of the island of Barbuda, to the society for propagating the gospel in foreign parts: and left a noble legacy to All-Souls College, of which he had been a fellow. This legacy consisted of his library, which was valued at 6000*l.*; and 10,000*l.* to be laid out, 6000 in building a library, and 4000 in furnishing it with books. He wrote some of the poems in the *Muse Americane*, printed at London in 1741.

CODRUS, the 17th and last king of Athens, son of Melanthus. When the Heraclidæ made war against Athens, the oracle said that the victory would be granted to that nation whose king was killed in battle. The Heraclidæ upon this gave strict orders to spare the life of Codrus; but the patriotic king disguised himself and attacked one of the enemy, by whom he was killed. The Athenians obtained the victory, and Codrus was deservedly called the father of his country. He reigned 21 years, about 2153 years before the Christian era. To pay more honour to his memory, the Athenians made a resolution that no man after Codrus should reign in Athens under the name of king.

COECUM, or BLIND GUT. See ANATOMY *Index*.

Dr Musgrave gives us an account, in the Philosophical Transactions, of the coecum of a dog being cut

out without any prejudice to the animal. Mr Giles gives us another of the coecum of a lady being distended, so as to form a tumor that held almost six pints of a thin, grayish, almost liquid substance, of which she died. And Mr Knowler a third, of a boy's coecum being vastly extended and stuffed with cherry-stones, which likewise proved mortal.

COEFFICIENTS, in *Algebra*, are such numbers or known quantities as are put before letters or quantities, whether known or unknown, and into which they are supposed to be multiplied. Thus, in $3x$, ax , or bx ; 3, a and b , are the coefficients of x : and in $6a$, $9b$; 6 and 9 are the coefficients of a and b . See ALGEBRA.

COELESTIAL, or CELESTIAL, in general, denotes any thing belonging to the heavens: thus we say, *celestial observations*, the *celestial globe*, &c.

COELIAC ARTERY, in *Anatomy*, that artery which issues from the aorta, just below the diaphragm. See ANATOMY *Index*.

COELIAC Vein, in *Anatomy*, that running through the intestinum rectum, along with the coeliac artery.

COELIMONTANA PORTA (Pliny), one of the gates of Rome, situated at the foot of Mount Coelius; and hence its name, thought to be the ancient *Ajinaria* by some; but this others doubt. By this gate Alaric with his Gotus is said to have entered and plundered Rome.

COELIOBRIGA, in *Ancient Geography*, a town of the Bracari in the Hither Spain, to the south of Bracara Augusta, the north of the Durio, and not far from the Atlantic; a municipium (Coin). Now thought to be *Barcelos*, a town of Entre Minho y Duero. W. Long. 9. 15. Lat. 41. 20.

COELIUS MONS, one of the seven hills of Rome, so called from *Cocles*, a Tuscan captain, who came to the assistance of Romulus against the Sabines, (Dionysius Halicarnassicus). Called also *Querculanus*, or *Quercetulanus*, from the oaks growing on it; and *Augustus*, by Tiberius (Tacitus, Suetonius). To the east it had the city walls, on the south the Coelicolus, to the west the Palatine, and on the north the Esquilina.

COELIOLUS, a part of Mount Coelius to the south called *Minor Coelius* (Martial); having the city walls on the east, the Aventine to the south, and on the west and north the valley through which the rivulet of the Appia runs.

COELOMA, among physicians, a hollow ulcer, seated in the tunica cornea of the eye.

COELOS PORTUS, in *Ancient Geography*, a town of the Chersonesus of Thrace, to the south of Sestos, where the Athenians erected a trophy, after a sea victory over the Lacedæmonians (Diodorus Siculus).

COELOSYRIA, in the larger sense of the word, was the name of the whole country lying southward of Seleucia, and extending as far as Egypt and Arabia; but this word is principally applied to the valley lying between Libanus and Antilibanus. This word occurs only in the apocryphal writings of the Old Testament.

COELUS (Heaven), in Pagan mythology, the son of Æther and Dies, or Air and Day. According to Hesiod, he married Terra or the Earth, on whom he begat Aurea or the Mountains, the Ocean, &c. But having at length imprisoned the Cyclops, who were also

Coefficients
||
Coelus.

Cocemetery also his children, his wife, being offended, incited her son Saturn to revenge the injury done to his brothers; and, by her assistance, he bound and castrated Coelus, when the blood that flowed from the wound produced the three furies, the giants, and the wood-nymphs; and the genital parts being thrown into the sea, impregnated the waters, and formed the goddess Venus. This deity was called by the Greeks *Uranus*.

COEMETERY. See **CEMETERY**.

COEMPTIONALES, among the Romans, an appellation given to old slaves, which were sold in a lot with others, because they could not be sold alone.

COENOBITE, a religious who lives in a convent, or in community, under a certain rule; in opposition to anchoret, or hermit, who lives in solitude. The word comes from the Greek *κοινος*, *communis*; and *βιος*, *vita*, "life." Cassian makes this difference between a *convent* and a *monastery*, that the latter may be applied to the residence of a single religious or recluse, whereas the *convent* implies *cœnobites*, or numbers of religious living in common. Fleury speaks of three kinds of monks in Egypt; *anchorets*, who live in solitude; *cœnobites*, who continue to live in community; and *sarabaites*, who are a kind of monks-errant, that stroll from place to place. He refers the institution of cœnobites to the times of the apostles, and makes it a kind of imitation of the ordinary lives of the faithful at Jerusalem. Though St Pachomius is ordinarily owned the institutor of the cœnobite life, as being the first who gave a rule to any community.

COENOBIMUM, (*κοινοβιον*), the state of living in a society, or community, where all things are common. Pythagoras is thought to be the author or first institutor of this kind of life; his disciples, though some hundreds in number, being obliged to give up all their private estates, in order to be annexed to the joint stock of the whole. The Essenians among the Jews, and Platonists, are said to have lived in the same manner. Many of the Christians also have thought this the most perfect kind of society, as being that in which Christ and his apostles chose to live.

COESFELDT, a town of Germany, in Westphalia, and in the territories of the bishop of Munster, where he often resides. It is near the river Burkel, E. Long. 64. 2. N. Lat. 51. 58.

COEVORDEN, one of the strongest towns in the United Provinces, in Overijssel, fortified by the famous Cohorn. It was taken by the bishop of Munster, 1673; and the Dutch retook it the same year. It is surrounded by a morass. E. Long. 6. 41. N. Lat. 52. 40.

COFFEA, the **COFFEE-TREE**. See **BOTANY Index**. The flowers, which are produced in clusters at the root of the leaves, are of a pure white, and have a very grateful odour. The fruit, which is the only useful part, resembles a cherry. When it comes to be of a deep red, it is gathered for the mill, in order to be manufactured into those *coffee-beans* now so generally known. The mill is composed of two wooden rollers furnished with iron plates 18 inches long, and 10 or 12 in diameter. These moveable rollers are made to approach a third which is fixed, and which they call the *chops*. Above the rollers is a hopper, in which they put the coffee, from whence it falls between the rollers and the chops, where it is stripped of its first

skin, and divided into two parts, as may be seen by the form of it after it has undergone this operation; being flat on the one side and round on the other. From this machine it falls into a brass sieve, where the skin drops between the wires, while the fruit slides over them into baskets placed ready to receive it: it is then thrown into a vessel full of water, where it soaks for one night, and is afterwards thoroughly washed. When the whole is finished, and well dried, it is put into another machine called the *peeling-mill*. This is a wooden grinder, turned vertically upon its trendle by a mule or horse. In passing over the coffee it takes off the parchment, which is nothing but a thin skin that detaches itself from the berry in proportion as it grows dry. The parchment being removed, it is taken out of this mill to be put into another, which is called the *winnowing-mill*. This machine is provided with four pieces of tin fixed upon an axle, which is turned by a slave with considerable force; and the wind that is made by the motion of these plates clears the coffee of all the pellicles that are mixed with it. It is afterwards put upon a table, where the broken berries, and any filth that may remain among them, are separated by negroes, after which the coffee is fit for sale.

The coffee-tree is cultivated in Arabia, Persia, the East Indies, the isle of Bourbon, and several parts of America. It is also raised in botanic gardens in several parts of Europe. Prince Eugene's garden at Vienna produced more coffee than was sufficient for his own consumption. It delights particularly in hills and mountains, where its root is almost always dry, and its head frequently watered with gentle showers. It prefers a western aspect, and ploughed ground without any appearance of grass. The plants should be placed at eight feet distance from each other, and in holes twelve or fifteen inches deep. If left to themselves, they would rise to the height of 16 or 18 feet, as already observed; but they are generally stunted to five, for the conveniency of gathering their fruit with the greater ease. Thus dwarfed, they extend their branches so, that they cover the whole spot round about them. They begin to yield fruit the third year, but are not in full bearing till the fifth. With the same infirmities that most other trees are subject to, these are likewise in danger of being destroyed by a worm or by the scorching rays of the sun. The hills where the coffee-trees are found have generally a gravelly or chalky bottom. In the last, it languishes for some time and then dies; in the former, its roots, which seldom fail of striking between stones, obtain nourishment, and keep the tree alive and fruitful for 30 years. This is nearly the period for plants of the coffee-tree. The proprietor, at the end of this period, not only finds himself without trees, but has his land reduced, that it is not fit for any kind of culture; and unless he is so situated, that he can break up a spot of virgin land, to make himself amends for that which is totally exhausted by the coffee-trees, his loss is irreparable.

The coffee produced in Arabia is found so greatly to excel that raised in the American plantations or elsewhere, that the cultivation of the tree is now but seldom practised in any of the British colonies. Large plantations of this kind were formerly made in some

Coffee,
Coffee.

of them; and it was proposed to the parliament to give a proper encouragement for cultivating this commodity there, so as to enable the planters to undersell the importers from Arabia. Accordingly, there was an abatement of the duty payable on all coffee imported from our colonies in America, which at that time was supposed to be sufficient encouragement for this kind of commerce; but the inferiority of the American coffee to the Arabian hath almost ruined the project. Mr Miller proposes some improvements in the method of cultivation. According to him, the trees are planted in too moist a soil, and the berries are gathered too soon. They ought, he says, to be permitted to remain on the trees till their skins are shrivelled, and they fall from the trees when shaken. This will indeed greatly diminish their weight, but the value of the commodity will thereby be increased to more than double of that which is gathered sooner. In Arabia, they always shake the berries off the trees, spreading cloths to receive them, and only take such as readily fall at each time. Another cause may be the method of drying the berries. They are, he observes, very apt to imbibe moisture, or the flavour of any thing placed near them. A bottle of rum placed in a closet, in which a canister of coffee-berries closely stopped was standing on a shelf at a considerable distance, in a few days so impregnated the berries as to render them very disagreeable. Some years ago, a coffee-ship from India had a few bags of pepper put on board, the flavour of which was imbibed by the coffee, and the whole cargo spoiled. For these reasons coffee-berries should never be brought over in ships freighted with rum, or laid to dry in the houses where sugars are boiled or rum distilled. When they are fully ripe, they should be shaken off when the trees are perfectly dry, and spread upon cloths to dry in the sun, carrying them every evening under cover, to prevent the dews or rain from falling on them. When perfectly dry, they should have their outer skins beaten off, and then be carefully packed up in cloths or bags three or four times double.

COFFEE also denotes a kind of drink, prepared from those berries; very familiar in Europe for these 100 years, and among the Turks for 170.

Its origin is not well known. Some ascribe it to the prior of a monastery, who being informed by a goat-herd, that his cattle sometimes browsing on the tree would wake and caper all night, became curious to prove its virtue: accordingly, he first tried it on his monks, to prevent their sleeping at matins. Others, from Sehehabeddin, refer the invention of coffee to the Persians, from whom it was learned in the 15th century by G. maleddin, mufti of Aden, a city near the mouth of the Red sea, and who having tried its virtues himself, and found that it dissipated the fumes which oppressed the head, inspired joy, opened the bowels, and prevented sleep, without being incommoded by it, recommended it first to his dervises, with whom he used to spend the night in prayer. Their example brought coffee into vogue at Aden; the professors of the law for study, artisans to work, travellers to walk in the night, in fine every body at Aden, drank coffee. Hence it passed to Mecca, where first the devotees, then the rest of the people, took it. From Arabia Felix it passed to Cairo. In

Coffee.

1511, Kahie Beg prohibited it, from a persuasion that it inebriated, and inclined to things forbidden. But Sultan Causou immediately after took off the prohibition, and coffee advanced from Egypt to Syria and Constantinople. The dervises declaimed against it from the Alcoran, which declares, that coal is not of the number of things created by God for food. Accordingly, the mufti ordered the coffee-houses to be shut; but his successor declaring coffee not to be coal, they were again opened. During the war in Candia the assemblies of news-mongers making too free with state affairs, the grand visir Cuproli suppressed the coffee-houses at Constantinople, which suppression, though still on foot, does not prevent the public use of the liquor there. Thevenot the traveller, was the first who brought it into France; and a Greek servant, named *Pasqua*, brought into England by Mr Dan. Edwards, a Turkey merchant, in 1652, to make his coffee, first set up the profession of *coffee-man*, and introduced the drink into this island.

The word *coffee* is originally Arabic: the Turks pronounce it *cabeub*, and the Arabians *cabuab*; which some authors maintain to be a general name for any thing that takes away the appetite, others for any thing that promotes appetite, and others again for any thing that gives strength and vigour.—The Mahometans, it is observed, distinguish three kinds of *cabuab*. The first is wine, or any liquor that inebriates; the second is made of the pods that contain the coffee-berry; this they call the *Sultan's coffee*, from their having first introduced it on account of its heating less than the berry, as well as its keeping the bowels open; the third is that made with the berry itself, which alone is used in Europe, the pods being found improper for transportation. Some Europeans who imported the pods, called them the *flower of the coffee-tree*. The deep brown colour of the liquor occasioned its being called *syrup of the Indian mulberry*, under which specific name it first gained ground in Europe.

The preparation of coffee consists in roasting, or giving it a just degree of torrefaction on an earthen or metalline plate, till it has acquired a brownish hue equally deep on all sides. It is then ground in a mill, as much as serves the present occasion. A proper quantity of water is next boiled, and the ground coffee put into it. After it has just boiled, it is taken from the fire, and the decoction having stood a while to settle and fine, they pour or decant it into dishes. The ordinary method of roasting coffee amongst us is in a tin cylindrical box full of holes, through the middle whereof runs a spit. Under this is a semicircular hearth, whereon is a large charcoal-fire: by help of a jack the spit turns swift, and so roasts the berry, being now and then taken up to be shaken. When the oil rises, and it is grown of a dark brown colour, it is emptied into two receivers made with large hoops, whose bottoms are iron plates: there the coffee is shaken, and left till almost cold; and if it look bright and oily, it is a sign it is well done.

Very different accounts have been given of the medicinal qualities of this berry. To determine its real effects on the human body, Dr Percival has made several experiments, the result of which he gives in the following words: "From these observations we may infer, that coffee is slightly astringent, and antiseptic; that

Coffee,
Coffer.

that it moderates alimentary fermentation, and is powerfully sedative. Its action on the nervous system probably depends on the oil it contains; which receives its flavour, and is rendered mildly empyreumatic, by the process of roasting. Neumann obtained by distillation from one pound of coffee, five ounces five drachms and a half of water, six ounces and half a drachm of thick fetid oil, and four ounces and two drachms of a caput mortuum. And it is well known, that rye, torrefied with a few almonds, which furnish the necessary proportion of oil, is now frequently employed as a substitute for these berries.

“ The medicinal qualities of coffee seem to be derived from the grateful sensation which it produces in the stomach, and from the sedative powers it exerts on the *vis vitæ*. Hence it assists digestion, and relieves the headach; and is taken in large quantities, with peculiar propriety, by the Turks and Arabians, because it counteracts the narcotic effects of opium, to the use of which those nations are much addicted.

“ In delicate habits, it often occasions watchfulness, tremors, and many of those complaints which are denominated nervous. It has been even suspected of producing palsies; and from my own observation, I should apprehend, not entirely without foundation, Stare asserts, that he became paralytic by the too liberal use of coffee, and that this disorder was removed by abstinence from that liquor.

“ The following curious and important observation is extracted from a letter with which I was honoured by Sir John Pringle, in April 1773: ‘ On reading your section concerning coffee, one quality occurred to me which I had observed of that liquor, confirming what you have said of its sedative virtues. It is the best abater of the paroxysms of the periodic asthma that I have seen. The coffee ought to be of the best Mocco, newly burnt, and made very strong immediately after grinding it. I have commonly ordered an ounce for one dish; which is to be repeated fresh after the interval of a quarter or half an hour; and which I direct to be taken without milk or sugar. The medicine in general is mentioned by Musgrave, in his treatise *De arthritide anomala*; but I first heard of it from a physician in this place, who having once practised it in Litchfield, had been informed by the old people of that place, that Sir John Floyer, during the latter years of his life, kept free from, or at least lived easy under, his asthma, from the use of very strong coffee. This discovery, it seems, he made after the publication of his book upon that disease. Since the receipt of that letter, I have frequently directed coffee in the asthma with great success.’ ”

COFFER, in *Architecture*, a square depression or sinking in each interval between the modillions of the Corinthian cornice; ordinarily filled up with a rose; sometimes with a pomegranate, or other enrichment.

COFFER, in *Fortification*, denotes a hollow lodgement, athwart a dry moat, from 6 to 7 feet deep, and from 16 to 18 broad; the upper part made of pieces of timber raised two feet above the level of the moat, which little elevation has hurdles laden with earth for its covering, and serves as a parapet with embrasures: the coffer is nearly the same with the caponiere, excepting that this last is sometimes made beyond the counterscarp on the glacis, and the

coffer always in the moat, taking up its whole breath, which the caponiere does not. It differs from the traverse and gallery, in that these latter are made by the besiegers, and the coffer by the besieged. The besieged generally make use of coffers to repulse the besiegers when they endeavour to pass the ditch. To save themselves from the fire of these coffers, the besiegers throw up the earth on that side towards the coffer.

COFFERER of the KING'S HOUSEHOLD, a principal officer in the court, next under the comptroller. He was likewise a white-staff officer, and always a member of the privy council. He had a special charge and oversight of the other officers of the household. He paid the wages of the king's servants below stairs, and for provisions as directed by the board of green cloth. This office is now suppressed, and the business of it is transacted by the lord steward, and paymaster of the household. He had 100*l.* a year wages, and 400*l.* a year board-wages.

COFFIN, the chest in which dead bodies are put into the ground.

The sepulchral honours paid to the manes of departed friends in ancient times, demand attention, and are extremely curious. Their being *put into a coffin* has been particularly considered as a mark of the highest distinction. With us the poorest people have their coffins. If the relations cannot afford them, the parish is at the expence. On the contrary, in the east they are not at all made use of in our times; Turks and Christians, as Thevenot assures us, agree in this. The ancient Jews seem to have buried their dead in the same manner: neither was the body of our Lord, it should seem, put into a coffin; nor that of Elisha, 2 Kings xiii. 21. whose bones were touched by the corpse that was let down *a little after* into his sepulchre. However, that they were anciently made use of in Egypt, all agree; and antique *coffins of stone*, and *sycamore-wood*, are still to be seen in that country; not to mention those said to be made of a kind of pasteboard; formed by folding or glueing cloth together a great many times, curiously plastered, and then painted with hieroglyphics. Its being an ancient Egyptian custom, and not practised in the neighbouring countries, were, doubtless, the cause that the sacred historian expressly observes of Joseph, that he was not only embalmed, but put into a coffin too*; * *Gen. i.* both being managements peculiar to the Egyptians. 26.

Bishop Patrick, in his commentary on this passage, takes notice of these Egyptian coffins of sycamore wood, and of pasteboard; but he doth not mention the contrary usage in the neighbouring countries, which was requisite, one might suppose, in order fully to illustrate the place: but even this perhaps would not have conveyed the whole idea of the sacred author. Maillot apprehends that all were not inclosed in coffins who were laid in the Egyptian repositories of the dead; but that it was an honour appropriated to persons of figure: for after having given an account of several riches found in those chambers of death, he adds †, “ But it must not be imagined that † *Let. vii.* the bodies deposited in these gloomy apartments were p. 181. all inclosed in chests, and placed in niches. The greatest part were simply embalmed and swathed after that manner which every one hath some notion of;

Coffiner,
Coffin.

Coffin
||
Cognac. of; after which they laid them one by the side of another without any ceremony. Some were even laid in these tombs without any embalming at all; or such a slight one, that there remains nothing of them in the linen in which they were wrapped, but the bones, and those half rotten. It is probable, that each considerable family had one of these burial-places to themselves; that the niches were designed for the bodies of the heads of the families; and that those of their domestics or slaves had no other care taken of them than the laying them on the ground, after having been embalmed, or even without that; which, undoubtedly, was also all that was done even to the heads of families of less distinction." After this he gives an account of a way of burial, practised anciently in that country, which had been but lately discovered, and which consisted in placing the bodies, after they were swathed, upon a layer of charcoal, and covering them with a mat, under a depth of sand of seven or eight feet.

That *coffins* then were not universally used in Egypt, is undoubted from these accounts; and probably they were only persons of distinction who were buried in them. It is also reasonable to believe, that in times so remote as that of Joseph, they might be much less common than afterwards; and consequently, that Joseph's being put in a coffin in Egypt might be mentioned with a design to express the great honours which the Egyptians did him at his death, as well as in life, being interred after the most sumptuous manner of the Egyptians, *embalmed, and put into a coffin*. Agreeably to this, the Septuagint version, which was made for Egyptians, seems to represent coffins as a mark of grandeur. Job xxi. 32.

It is no objection to this account, that the widow of Nain's son is represented as carried forth to be buried in a *cogos*, or "on a bier:" for the present inhabitants of the Levant, who are well known to lay their dead bodies in the earth uninclosed, carry them frequently out to burial in a kind of coffin. So Dr Ruffel, in particular, describes the bier used for the Turks at Aleppo, as a kind of coffin much in the form of ours, only that the lid rises with a ledge in the middle. Christians, indeed, as he tells us, are carried to the grave on an open bier: but as the most common kind of bier resembles our coffins, that used by the people of Nain might very possibly be of the same kind; in which case the word *cogos* was very proper.

COGGLE, or COG, a small fishing-boat upon the coasts of Yorkshire: and cogs (*cogones*) are a kind of little ships or vessels used in the rivers Ouse and Humber; (Stat. 23. Hen. VIII. c. 18.) *Præparatis cogonibus, galleis, et aliis navibus, &c.* (Mat. Paris. ann. 1066). And hence the cogmen, boatmen, and seamen, who after shipwreck or losses by sea travelled and wandered about to defraud the people by begging and stealing, until they were restrained by proper laws.

COGITATION, a term used by some for the act of thinking.

COGNAC, a town of France in Angoumois, with a castle, where Francis I. was born. It is seated on the river Charante, in a very pleasant country, abounding

in wine, and remarkable for excellent brandy. W. Long. o. 10. N. Lat. 45. 44.

COGNATE, in *Scots Law*, any male relation by the mother.

COGNATION, in the civil law, a term for that line of consanguinity which is between males and females, both descended from the same father; as agnation is for the line of parentage between males only descended from the same stock.

COGNI, an ancient and strong town of Caramania in Turkey in Asia, and the residence of a beglerbeg. It is seated in a pleasant country, abounding in corn, fruits, pulse, and cattle. Here are sheep whose tails weigh 30 pounds. E. Long. 35. 56. N. Lat. 37. 56.

COGNITIONIS CAUSA, in *Scots Law*. When a creditor charges the heir of his debtor to enter, in order to constitute the debt against him, and the heir renounces the succession, the creditor can obtain no decreet of constitution of that debt against the heir; but only a decreet subjecting the *hereditas jacens*, or the estate which belonged to the debtor, to his diligence: and this is called a decreet *cognitionis causa*.

COGNIZANCE, or CONNUSANCE, in *Law*, has divers significations. Sometimes it is an acknowledgement of a fine, or confession of something done; sometimes the hearing of a matter judicially, as to take cognizance of a cause; and sometimes a particular jurisdiction, as cognizance of pleas is an authority to call a cause or plea out of another court, which no person can do but the king, except he can show a charter for it. This cognizance is a privilege granted to a city or a town to hold plea of all contracts, &c. within the liberty; and if any one is impleaded for such matters in the courts at Westminster, the mayor, &c. of such franchise may demand cognizance of the plea, and that it may be determined before them.

COGNIZANCE is also used for a badge on a waterman's or serving-man's sleeve, which is commonly the giver's crest, whereby he is decerned to belong to this or that nobleman or gentleman.

COGGS. See COGGLE.

COHABITATION, denotes the state of a man and a woman who live together without being legally married. By the common law of Scotland, cohabitation for year and day, or a complete twelvemonth, is deemed equivalent to matrimony.

CO-HEIR, one who succeeds to a share of an inheritance, to be divided among several.

COHESION, one of the four species of attraction, denoting that force by which the parts of bodies adhere or stick together.

This power was first considered by Sir Isaac Newton as one of the properties essential to all matter, and the cause of all that variety we observe in the texture of different terrestrial bodies. He did not, however, absolutely determine that the power of cohesion was an immaterial one; but thought it might possibly arise, as well as that of gravitation, from the action of an ether. His account of the original constitution of matter is as follows: It seems probable, that God in the beginning formed matter in solid, massy, impenetrable, moveable particles; of such sizes, figures, and other properties, and in such proportion to space, as most conduced to the end for which he formed them; and

Cognate
||
Cohesion.

1
Considered by Sir Isaac Newton as an essential property of matter.

2
His account of the original constitution of matter.

Cohesion. that these primitive particles being solid, are incomparably harder than any porous bodies composed of them; even so very hard as never to wear or break in pieces; no ordinary power being able to divide what God himself made one at the first creation. While the particles continue entire, they may compose bodies of one and the same nature and texture in all ages; but should they wear away, or break in pieces, the nature of all things depending on them would be changed. Water and earth composed of old worn particles and fragments of particles, would not now be of the same texture with water and earth composed of entire particles in the beginning. And therefore, that nature may be lasting, the changes of corporeal things are to be placed in the various separations and new associations and motions of these permanent particles; compound bodies being apt to break, not in the midst of solid particles, but where these particles are laid together, and touch in a few points." It seems farther, "That these particles have not only a *vis inertiae*, accompanied with such passive laws of motion as naturally result from that force; but also that they are moved by certain active principles, such as that of gravity, and that which causeth fermentation and the cohesion of bodies. These principles are to be considered not as occult qualities, supposed to result from the specific forms of things, but as general laws of nature by which the things themselves are formed; their truth appearing to us by phenomena, though their cause is not yet discovered."

³
Attraction
of the general
law of nature.

The general law of nature, by which all the different bodies in the universe are composed, according to Sir Isaac Newton, is that of attraction: i. e. "Every particle of matter has an attractive force, or a tendency to every other particle; which power is strongest in the point of contact, and suddenly decreases, insomuch that it acts no more at the least sensible distance; and at a greater distance is converted into a repellent force, whereby the parts fly from each other. On this principle of attraction may we account for the cohesion of bodies, otherwise inexplicable.

⁴
Formation
of particles
of different
sizes.

"The smallest particles may cohere by the strongest attractions, and compose bigger particles of weaker virtue; and many of these may cohere, and compose bigger particles, whose virtue is still less; and so on for divers successions, until the progression end in the biggest particles, on which the operations in chemistry, and the colours of natural bodies, depend; and which, by cohering, compose bodies of a sensible magnitude. If the body is compact, and bends or yields inward to pressure without any sliding of its parts, it is hard and elastic, returning to its figure with a force arising from the mutual attraction of its parts. If the parts slide from one another, the body is malleable or soft. If they slip easily, and are of a fit size to be agitated by heat, and the heat is great enough to keep them in agitation, the body is fluid; and if it be apt to stick to things, it is humid; and the drops of every fluid affect a round figure by the mutual attractions of their parts, as the globe of the earth and sea affects a round figure from the mutual attraction and gravity of its parts.

⁵
Distinction
of bodies
into hard,
soft, humid,
&c.

"Since metals dissolved in acids attract but a small quantity of the acid, their attractive force reaches but

to a small distance. Now, as in algebra, where affirmative quantities cease, there negative ones begin; so in mechanics, where attraction ceases, there a repulsive virtue must succeed. That there really is such a virtue seems to follow from the reflections and inflections of the rays of light; the rays being repelled by bodies in both these cases without the immediate contact of the reflecting or inflecting body. The same thing seems also to follow from the emission of light; a ray, as soon as shaken off from a body by the vibrating motion of the parts of the body, and got beyond the reach of attraction, being driven away with exceeding great velocity; for that force which is sufficient to turn it back in reflection may be sufficient to emit it. From the same repelling power it seems to be that flies walk upon the water without wetting their feet; that the object-glasses of long telescopes lie upon one another without touching; and that dry powders are difficultly made to touch one another so as to stick together, without melting them or wetting them with water, which, by exhaling, may bring them together.

Cohesion.
⁶
Existence
of repulsive
power proved.

"The particles of all hard homogeneous bodies which touch one another, cohere with a great force; to account for which, some philosophers have recourse to a kind of hooked atoms, which in effect is nothing else but to beg the question. Others imagine, that the particles of bodies are connected by rest, i. e. in effect by nothing at all; and others, by conspiring motions, i. e. by a relative rest among themselves. For myself, it rather appears to me, that the particles of bodies cohere by an attractive force, whereby they tend mutually to each other."

From this account of the formation and constitution of bodies, we can conclude nothing, except that they are composed of an infinite number of little particles, kept together by a force or power; but of what nature that power is, whether material or immaterial, we must remain ignorant till farther experiments are made. Some of the Newtonian philosophers, however, have positively determined these powers to be immaterial. In consequence of this supposition, they have so refined upon attractions and repulsions, that their systems seem not far from downright scepticism, or denying the existence of matter altogether. A system of this kind we find adopted by Dr Priestley*, * *Hist. of* from Messrs Boscovich and Michell, in order to solve some difficulties concerning the Newtonian doctrine of light. "The easiest method (says he) of solving all difficulties, is to adopt the hypothesis of Mr Boscovich, who supposes that matter is not impenetrable, as has been perhaps universally taken for granted; but that it consists of physical points only, endued with powers of attraction and repulsion in the same manner as solid matter is generally supposed to be: provided therefore that any body moves with a sufficient degree of velocity, or has a sufficient *momentum* to overcome any powers of repulsion that it may meet with, it will find no difficulty in making its way through any body whatever; for nothing else will penetrate one another but powers, such as we know do in fact exist in the same place, and counterbalance or overrule one another. The most obvious difficulty, and indeed almost the only one that attends this hypothesis, as it supposes the mutual penetrability of matter, arises from the

⁷
No conclusion
to be drawn
from this
account.

* *Hist. of*
Physic, vol. i.
p. 352.

⁸
Mr Michell's
hypothesis
adopted by
Dr Priestley.

Cohesion.

9
Bodies oppose each other not from actual contact.

idea of the nature of matter, and the difficulty we meet with in attempting to force two bodies into the same space. But it is demonstrable that the first obstruction arises from no actual contact of matter, but from mere powers of repulsion. The difficulty we can overcome; and having got within one sphere of repulsion, we fancy that we are now impeded by the solid matter itself. But the very same is the opinion of the generality of mankind with respect to the first obstruction. Why, therefore, may not the next be only another sphere of repulsion, which may only require a greater force than we can apply to overcome it, without disordering the arrangement of the constituent particles; but which may be overcome by a body moving with the amazing velocity of light.

10
Mr Baxter's opinion.

"This scheme of the *immateriality of matter* as it may be called, or rather the *mutual penetration of matter*, first occurred to Mr Michell on reading *Baxter on the immateriality of the soul*. He found that this author's idea of matter was, that it consisted, as it were, of bricks cemented together with immaterial mortar. These bricks, if he would be consistent with his own reasoning, were again composed of less bricks, cemented likewise by an immaterial mortar; and so on *ad infinitum*. This putting Mr Michell upon the consideration of the several appearances of nature, he began to perceive that the bricks were so covered with this immaterial mortar, that if they had any existence at all, it could not possibly be perceived; every effect being produced, in nine instances of ten certainly, and probably in the tenth also, by this immaterial, spiritual, and penetrable mortar. Instead therefore of placing the world upon the giant, the giant upon the tortoise, and the tortoise upon, he could not tell what, he placed the world at once upon itself."

11
Cohesion supposed owing to elementary fire.

Other philosophers have supposed the powers both of gravitation and cohesion to be material; and to be only different actions of the ethereal fluid, or elementary fire. In support of this it has been urged, that before we have recourse to a spiritual and immaterial power as the cause of any natural phenomenon, we ought to be well assured that there is no material substance with which we are acquainted, that is capable of producing such effects. In the present case, we are so far from having such assurance, that the contrary is manifest to our senses. One instance of this is in the experiment with the *Magdeburg hemispheres*, as they are called. These are two hollow hemispheres of brass, exactly fitted to one another, so as to form one globe when joined together, without admitting any air at the joining. In this state, if the air within them is exhausted by means of a pump, they will cohere with such force, if they are five or six inches diameter, as to require a weight of some hundreds of pounds to separate them. The pressure of the atmosphere, we see, is in this case capable of producing a very strong cohesion; and if there is in nature any fluid more penetrating, as well as more powerful in its effects, than the air we breathe, it is possible that what is called the *attraction of cohesion* may some how or other be an effect of the action of that fluid. Such a fluid as this is the element of fire. Its activity is such as to penetrate all bodies whatever; and in the state in which it is commonly called *fire*, it acts according to the quantity of solid matter contained in the

Cohesion.

body. In this state, it is capable of dissolving the strongest cohesions observed in nature; but whatever is capable of dissolving any cohesion, must necessarily be endued with greater power than that by which the cohesion is caused. Fire, therefore, being able to dissolve cohesions, must also be capable of causing them, provided its power is exerted for that purpose. Nor will it seem at all strange that this fluid should act in two such opposite ways, when we consider the different appearances which it assumes. These are three, viz. fire or heat, in which it consumes, destroys, and dissolves: light, in which it seems deprived of all destructive or dissolvent power, and to be the most mild, quiet, and placid being in nature. The third state of this element is, when it becomes what is called the *electric fluid*; and then it attracts, repels, and moves bodies, in a vast variety of ways, without either burning or rendering them visible by its light. In this state it is not less powerful than in either of the other two; for a violent shock of electricity will displace and tear in pieces the most heavy and solid bodies. The seeming capricious nature of this fluid, however, probably renders it less suspected as the cause of cohesion, than it otherwise would be, were the attractions regular and permanent, which we observe it to occasion. But here we must observe, that the fluid has an existence in all bodies before the experiments are tried which make its effects visible to us, and is acting in them according to its settled and established laws. While acting in this manner it is perfectly invisible; and all we can do is, to produce some little infringement of these regular laws according to which it commonly acts. In some cases, however, the electrical attractions produced by art are found to be pretty permanent and strong. Thus, Mr Symmer, in some experiments with silk stockings, found their attraction so strong, that it required upwards of 15 pounds weight to separate them from each other; and this attraction would continue for more than an hour. In plates of glass, too, he observed a remarkable cohesion when electrified. In the *Philosophical Transactions* for 1777, we find this hypothesis taken notice of, and in some measure adopted, by Mr Henley. "Some gentlemen (says he) have supposed that the electric matter is the cause of the cohesion of the particles of bodies. If the electric matter be, as I suspect, a real elementary fire inherent in all bodies, that opinion may probably be well founded; and perhaps the soldering of metals, and the cementation of iron, by fire, may be considered as strong proofs of the truth of their hypothesis."

On this last hypothesis we must observe, that if the electric, or any other fluid, is supposed to be the cause of the attraction of cohesion universally, the particles of that fluid must be destitute of all cohesion between themselves; otherwise we should be at as great a loss to account for the cohesion of these particles, as for that of terrestrial matter. Philosophers, indeed, do not suppose any cohesion between the particles of the electric fluid themselves; it is generally believed that the particles of this fluid are repulsive of one another, though attracted by all other matter. If this is a fact, we cannot suppose the electric fluid to be the cause of cohesion. The probability or improbability of the hypothesis just mentioned, must greatly depend on its being

Cohobation
||
Coimbra.

ing ascertained whether the particles of the electric fluid do really repel one another, and attract all other kinds of matter, or not; but for this we must refer to the article ELECTRICITY.

COHOBATION, in *Chemistry*, an operation by which the same liquor is frequently distilled from the same body, either with an intention to dissolve this body, or to produce some change upon it. This is one of those operations which the ancient chemists practiced with great patience and zeal, but which is now neglected. To make the operation easier, and to prevent the trouble of frequently changing the vessels, a particular kind of alembic, called a *pelican*, was invented. This vessel was made in the form of a cucurbit with an alembic-head, but had two spouts communicating with the body. As the vapour rose up into the head, it was gradually condensed, and ran down the spouts into the body of the pelican from whence it was again distilled; and so on.

COHORN (N.) the greatest engineer Holland has produced. Among his other works, which are esteemed masterpieces of skill, he fortified Bergen-op-zoom; which, to the surprise of all Europe, was taken by the French in 1747; but that, it is believed, was the effect of treachery. He wrote a treatise on fortification, and died in 1704.

COHORT, in Roman antiquity, the name of part of the Roman legion, comprehending about 600 men. There were ten cohorts in a legion, the first of which exceeded all the rest both in dignity and number of men. When the army was ranged in order of battle, the first cohort took up the right of the first line; the rest followed in their natural order; so that the third was in the centre of the first line of the legion, and the fifth on the left; the second between the first and third; and the fourth between the third and fifth: the five remaining cohorts formed a second line in their natural order.

COIF, the badge of a serjeant at law, who is called serjeant of the coif, from the lawn coif they wear under their caps when they are created serjeants.

The chief use of the coif was to cover the clerical tonsure. See TONSURE.

COILING, on shipboard, implies a sort of serpentine winding of a cable or other rope, that it may occupy a small space in the ship. Each of the windings of this sort is called a *fak*; and one range of fakes upon the same line is called a *tier*. There are generally from five to seven fakes in a tier; and three or four tiers in the whole length of the cable. This, however, depends on the extent of the fakes. The smaller ropes employed about the sails are coiled upon cleats at sea, to prevent their being entangled amongst one another in traversing, contracting, or extending the sails.

COILON, in the ancient Grecian theatres, the same with the *cavea* of the Romans.

COIMBRA, a handsome, large, and celebrated town of Portugal, capital of the province of Beira, with a bishop's see, and a famous university. The cathedral and the fountains are very magnificent. It is seated in a very pleasant country abounding in vineyards, olive-trees, and fruits. It stands on a mountain,

by the side of the river Mondego. W. Long. 8. 17. N. Lat. 40. 12. Coim.

COIN, a piece of metal converted into money by the impression of certain marks or figures thereon.

COIN differs from MONEY as the species from the genus. Money is any matter, whether metal, wood, leather, glass, horn, paper, fruits, shells, or kernels, which have currency as a medium in COMMERCE. Coin is a particular species, always made of metal, and struck according to a certain process called COINING.

The precise epocha of the invention of money is too ancient for our annals; and, if we might argue from the necessity and obviousness of the thing, must be nearly coeval with the world.

Whether coins be of equal antiquity, may admit of some doubt; especially as most of the ancient writers are so frequent and express in their mention of leathern-moneys, paper-moneys, wooden-moneys, &c. Some, however, notwithstanding this, are of opinion, that the first moneys were of metal: the reasons they give, are the firmness, neatness, cleanness, durableness, and universality of metals; which, however, do rather conclude they ought to have been so, than that they actually were so.

In effect, the very commodities themselves were the first moneys, i. e. were current for one another by way of exchange; and it was the difficulty of cutting or dividing certain commodities, and the impossibility of doing it without great loss, that first put men on the expedient of a general medium. See EXCHANGE.

Indeed, thus much may be said in behalf of coins, that, on this view, it was natural for men to have their first recourse to metals, as being almost the only things whose goodness, and as it were integrity, is not diminished by partition; besides the advantages above expressed, and the conveniences of melting and returning them into a mass of any size or weight.

It was probably, then, this property of metals which first accustomed people, who traded together, to account them in lieu of quantities of other merchandises in their exchanges, and at length to substitute them wholly in their stead; and thus arose money; as it was their other property to preserve any mark or impression a long time, which confirmed them in the right; and thus was the first rise of coins.

In the first ages, each person cut his metal into pieces of different sizes and forms, according to the quantity to be given for any merchandise, or according to the demand of the seller, or the quantity stipulated between them. To this end they went to market loaded with metal in proportion to the purchase to be made, and furnished with instruments for portioning it, and scales for dealing it out, according as occasion required. By degrees, it was found more commodious to have pieces ready weighed; and as there were different weights required according to the value of the different wares, all those of the same weight began to be distinguished with the same mark or figure: thus were coins carried one step further. At length the growing commerce of money beginning to be disturbed with frauds, both in the weights and the matter, the public authority interposed; and hence the first stamps or impressions of money; to which succeeded

Coin. ed the names of the monies; and at length the effigy of the prince, the date, legend, and other precautions to prevent the alterations of the species; and thus were coins completed.

Modern Coins. In England the current species of gold are the guinea, half-guinea, seven-shillings piece, Jacobus, laureat, angel, and rose-noble; the four last of which are now seldom to be met with; having been most of them converted into guineas, chiefly during the reign of Charles II. and James II. The silver coins are the crown, half-crown, shilling, and sixpence. Copper coins are the farthing, half-penny, penny and two-penny pieces.

In Scotland, by the articles of the Union, it is appointed that all the coins be reduced to the English, and the same accounts observed throughout. Till then the Scots had their pounds, shillings, and pence, as in England; but their pound was but 20 pence English, and the others in proportion: accordingly, their merk was 13 $\frac{1}{3}$ s. Scots, current in England at 13 $\frac{1}{2}$ d.; their noble in proportion. Besides these they had their turner-pence and half-pence; their penny $\frac{1}{2}$ of that of England: besides base money of achifons, babees, and placks. The bodle $\frac{1}{2}$ of the penny, $\frac{1}{3}$ of the achifon, $\frac{1}{2}$ of the babee, and $\frac{1}{2}$ of the plack.

In Ireland, the coins are as in England, viz. shillings, pence, &c. with this difference, that their shilling is but equal to 11 $\frac{1}{4}$ s. d. sterling: whence their pound is only 18s. 5 $\frac{1}{4}$ d.

But, for a view of all the coins presently current in the four quarters of the globe, with their values and proportions, see the table subjoined to the article MONEY.

In many places shells are current for coins; particularly a small white kind dug out of the ground in the Maldives, and some parts of America, called in the Indies *cowries*, or *coris*, on the coast of Africa *bonges*, and in America *porcelaines*; of which it takes a vast number to be equivalent in value to a penny. Of zimbis, another kind of shell current, particularly in the kingdoms of Angolo and Congo, two thousand make what the negroes call a *macoute*, which is no real money; for of this there is none in this part of Africa, but a manner of reckoning: thus, two Flemish knives they esteem a *macoute*; a copper basin two pounds weight, and 12 inches diameter, they reckon three *macoutes*; a fusée 10, &c.

In some places fruits are current for coins. Of these there are three sorts used; two in America, particularly among the Mexicans, which are the cacao and maize; the other in the East Indies, viz. almonds brought thither from Lar, and growing in the deserts of Arabia. Of cacao 15 are esteemed equivalent to a Spanish rial, or seven pence sterling. Maize has ceased to be a common money since the discovery of America by the Europeans. Almonds are chiefly used where the *cowries* are not current. As the year proves more or less favourable to this fruit, the value of the money is higher or lower. In a common year 40 almost are set against a *pescha*, or halfpenny sterling; which brings each almond to $\frac{1}{20}$ of a farthing.

Ancient Coins are those chiefly which have been current among the Jews, Greeks and Romans. Their values and proportions are as follow:

JEWISH.				sterl.	l.	s.	d.	Coin.
Gerah				0	0	0	1 $\frac{1}{1000}$	
10	Becah			0	0	0	1 $\frac{1}{100}$	
20		2	Shekel	0	0	0	2 $\frac{1}{8}$	
1200	120	50	Maneh Mina hebraica	5	14	0	$\frac{1}{4}$	
60000	6000	3000	60	Talent	342	3	9	
				Solidus aureus, or sextula, worth	0	12	0 $\frac{1}{2}$	
				Siculus aureus, worth	1	16	6	
				A talent of gold, worth	5475	0	0	

GRECIAN.				ster.	s.	d.	grs.					
Lepton				0	0	0	0 $\frac{1}{100}$					
7	Chalcus			0	0	0	0 $\frac{1}{8}$					
14		2	Dichalcus	0	0	0	1 $\frac{1}{4}$					
28		4	2	Hemiobolus	0	0	2 $\frac{1}{2}$					
56	8	4	2	Obolus	0	1	1 $\frac{1}{2}$					
112	16	8	4	2	Diobolus	0	2 $\frac{1}{2}$					
224	32	16	8	4	2	Tetrobolus	0	5				
336	48	24	12	6	3	1 $\frac{1}{2}$	Drachma	0	7			
652	96	48	24	12	6	3	2	Didrachmon	1	3		
1324	112	96	48	24	12	6	4	2	Tetrardstat.	2	7	
1660	384	120	60	30	15	7 $\frac{1}{2}$	5	2 $\frac{1}{2}$	1 $\frac{1}{4}$	Pentrad.	3	2

Note: Of these the drachma, didrachma, &c. were of silver, the rest for the most part of brass. The other parts, as tridrachm, tribolus, &c. were sometimes coined.

Note also: The drachma is here, with the generality of authors, supposed equal to the denarius; though there is reason to believe that the drachma was somewhat the weightier. See DRACHMA and DENARIUS.

	ster.	l.	s.	d.
The Grecian gold coin was the stater aureus, weighing two Attic drachms, or half of the stater argenteus, and exchanging usually for 25 Attic drachms of silver in our money.	0	16	1	3 $\frac{1}{2}$
According to our proportion of gold to silver	1	0	9	
There were likewise the stater cyzicenus, exchanging for 28 attic drachms, or Stater Philippicus, and stater Alexandrinus, of the same value.	0	18	1	
Stater daricus, according to Josephus, worth 50 attic drachms, or Stater cræsius, of the same value.	1	12	3	3 $\frac{1}{2}$

ROMAN.				ster.	s.	d.	grs.
Teruncius				0	0	0	0 $\frac{77}{1000}$
2	Semilibella			0	0	0	1 $\frac{55}{1000}$
4	2	Libella		0	0	0	3 $\frac{1}{10}$
1	2	As		0	1	3	$\frac{1}{4}$
20	10	5	2	Quinarius Victoriatius	0	3	3 $\frac{1}{2}$
40	20	10	4	2	Denarius	0	7

Note:

Coin,
Coinage.

Note: Of these the denarius, victoriatuſ, ſeſtertius, and ſometimes the aſ, were of ſilver, the reſt of braſs. See Aſ, &c.

There were ſometimes alſo coined of braſs the triens, ſextans, uncia, ſextula, and dupondiuſ.

The Roman gold coin was the aureuſ, which weighed generally double the denarius; the value of which according to the firſt proportion of coinage, mentioned by Pliny, was

According to the proportion that obtains now amongſt uſ, worth

According to the decuple proportion, mentioned by Livy and Julius Pollux, worth

According to the proportion mentioned by Tacituſ, and which afterwards obtained, whereby the aureuſ exchanged for 25 denarii, its value.

COIN, in *Architecture*, a kind of dye cut diagonally, after the manner of a flight of a ſtaircaſe, ſerving at bottom to ſupport columns in a level, and at top to correct the inclination of an entablature ſupporting a vault.

COIN is alſo uſed for a ſolid angle compoſed of two ſurfaces inclined towards each other, whether that angle be exterior, as the coin of a wall, a tree, &c. or interior, as the coin of a chamber or chimney. See QUOIN.

COINAGE, or COINING, the art of making money, as performed either by the hammer or mill.

Formerly the fabric of coins was different from what it is at preſent. They cut a large plate of metal into ſeveral little ſquares, the corners of which were cut off with ſciſſars. After having ſhaped theſe pieces, ſo as to render them perfectly conformable, in point of weight, to the ſtandard piece, they took each piece in hand again, to make it exactly round by a gentle hammering. This was called a *planchet*, and was ſit for immediate coining. Then engravers prepared, as they ſtill do, a couple of ſteel maſſes in form of dyes, cut and terminated by a flat ſurface, rounded off at the edges. They engraved or ſtamped on it the hollow of a head, a croſs, a ſcutcheon, or any other figure, according to the cuſtom of the times, with a ſhort legend. As one of theſe dyes was to remain dormant, and the other moveable, the former ended in a ſquare priſm, that it might be introduced into the ſquare hole of the block, which, being fixed very faſt, kept the dye as ſteady as any vice could have done. The planchet of metal was horizontally laid upon this inferior maſs, to receive the ſtamp of it on one ſide, and that of the upper dye, wherewith it was covered, on the other. This moveable dye, having its round engraved ſurface reſting upon the planchet, had at its oppoſite extremity a flat ſquare, and larger ſurface, upon which they gave ſeveral heavy blows, with a hammer of an enormous ſize, till the double ſtamp was ſufficiently, in relievo, impreſſed on each ſide of the planchet. This being finiſhed, was immediately ſucceeded by another, and they thus became a ſtandard coin, which had the degree of fineneſs of the weight and mark determined by the judgment of the inſpectors, to make it good current money; the ſtrong tempering which

was and is ſtill given to the two dyes, rendering them capable of bearing thoſe repeated blows. Coining has been conſiderably improved and rendered expeditious, by ſeveral ingenious machines, and by a wiſe application of the ſureſt physical experiments to the methods of ſining, dyeing, and ſtamping the different metals.

The three fineſt inſtruments the mint-man uſes, are the laminating engine; the machine for making the impreſſions on the edges of coins; and the mill.

After they have taken the laminæ, or plates of metal, out of the mould into which they are caſt, they do not beat them on the anvil, as was formerly done, but make them paſs and repaſs between the ſeveral rollers of the laminating engine, which being gradually brought cloſer and cloſer to each other, preſently give the lamina its uniform and exact thickneſs. Inſtead of dividing the lamina into ſmall ſquares, they at once cut clean out of it as many planchets as it can contain, by means of a ſharp ſteel trepan, of a roundiſh figure, hollow within, and of a proportionable diameter, to ſhape and cut off the piece at one and the ſame time. After thoſe planchets have been prepared and weighed with ſtandard pieces, filed or ſcraped to get off the ſuperfluous part of the metal, and then boiled and made clean, they arrive, at laſt, at the machine (fig. 1.), which marks them upon the edge; and finally, the mill (fig. 2.), which, ſqueezing each of them ſingly between the two dyes, brought near each other with one blow, forces the two ſurfaces or fields of the piece to fill exactly all the vacancies of the two figures engraved hollow. The engine which ſerves to laminate lead, gives a ſufficient notion of that which ſerves to flatten gold and ſilver laminæ between rollers of a leſſer ſize.

The principal pieces of the machine (fig. 1.), to ſtamp coins on the edge, are two ſteel laminæ, about a line thick. One half of the legend, or of the ring, is engraved on the thickneſs of one of the laminæ, and the other half on the thickneſs of the other; and theſe two laminæ are ſtraight, although the planchet marked with them be circular.

When they ſtamp a planchet, they firſt put it between the laminæ in ſuch a manner, as that theſe being each of them laid flat upon a copperplate, which is faſtened upon a very thick wooden table, and the planchet being likewise laid flat upon the ſame plate, the edge of the planchet may touch the two laminæ on each ſide, and in their thick part.

One of theſe laminæ is immoveable, and faſtened with ſeveral ſcrews; the other ſlides by means of a dented wheel, which takes into the teeth that are on the ſurface of the lamina. This ſliding lamina makes the planchet turn in ſuch a manner, that it remains ſtamped on the edge, when it has made one turn. Only crown and half-crown pieces can bear the impreſſion of letters on the thickneſs of their edges.

The coining engine or mill is ſo fitted for deſpatch (fig. 2.), that a ſingle man may ſtamp 20,000 planchets in one day: gold, ſilver, and copper planchets, are all of them coined with a mill, to which the coining ſquares (fig. 3.), commonly called dyes are faſtened; that of the face under, in a ſquare box furniſhed with male and female ſcrews, to fix and keep it ſteady; and the other above, in a little box garniſhed with the ſame ſcrews, to faſten the coining ſquare. The planchet

Coinage.

Plate CL.

Coinage.

chert is laid flat on the square of the effigy, which is dormant; and they immediately pull the bar of the mill by its cords, which causes the screw set within it to turn. This enters into the female screw, which is in the body of the mill, and turns with so much strength, that by pulling the upper square upon that of the effigy, the planchet, violently pressed between both squares, receives the impression of both at one pull, and in the twinkling of an eye.

The planchet thus stamped and coined, goes through a final examination of the mint wardens, from whose hands it goes into the world.

In the *COINING of Medals*, the process is the same in effect with that of money, the principal difference consisting in this, that money having but a small relief, receives its impression at a single stroke of the engine; whereas for medals, the height of their relief makes it necessary that the stroke be repeated several times: to this end the piece is taken out from between the dies, heated, and returned again; which process, in medallions and large medals, is repeated 15 or 20 times before the full impression be given: care must be taken, every time the planchet is removed, to take off the superfluous metal stretched beyond the circumference with a file. Medallions, and medals of a high relief, are usually first cast in sand, by reason of the difficulty of stamping them in the press, where they are put only to perfect them; in regard the sand does not leave them clear, smooth, and accurate enough. Therefore we may see that medals receive their form and impression by degrees, whereas money receives them all at once.

British COINAGE, both by the beauty of the engraving, and by the invention of the impressions on the edges, that admirable expedient for preventing the alteration of the species, is carried to the utmost perfection.

It was only in the reign of King William III. that the hammer-money ceased to be current in England, where till then it was struck in that manner, as in other nations. Before the hammer specie was called in, the English money was in a wretched condition, having been filed and clipped by natives as well as foreigners, inasmuch that it was scarce left of half the value: the retrieving this distressed state of the English money is looked upon as one of the glories of King William's reign.

The British coinage is now wholly performed in the Tower of London, where there is a corporation for it, under the title of the *mint*. Formerly there were here, as there are still in other countries, the rights of seignorage and brassage, but since the eighteenth year of King Charles II. there is nothing taken either for the king or for the expences of coining; so that weight is returned for weight to any person who carries their gold and silver to the Tower.

The species coined in Great Britain are esteemed contraband goods, and not to be exported. All foreign species are allowed to be sent out of the realm, as well as gold and silver in bars, ingots, dust, &c.

Barbary COINAGE, particularly that of Fez and Tunis, is under no proper regulations, as every goldsmith, Jew, or even private person, undertakes it at pleasure; which practice renders their money exceedingly bad, and their commerce very unsafe.

Muscovite COINAGE. In Muscovy there is no other coin struck but silver, and that only in the cities of Moscow, Novogorod, Twere, and Pleskow, to which may be added Petersburg. The coinage of each of these cities is let out to farm, and makes part of the royal revenue.

Persian COINAGE. All the money made in Persia is struck with a hammer, as is that of the rest of Asia; and the same may be understood of America, and the coasts of Africa, and even Muscovy: the king's duty, in Persia, is seven and a half per cent. for all the moneys coined, which are lately reduced to silver and copper, there being no gold coin there except a kind of medals, at the accession of a new sopher.

Spanish COINAGE is esteemed one of the least perfect in Europe. It is settled at Seville and Segovia, the only cities where gold and silver are struck.

COIRE, or, as the Germans call it, *CHUR*, a large and handsome town of Switzerland, and capital of the country of the Grisons, with a bishop's see whose prelate has the right of coining money. It is divided into two parts; the least of which is of the Roman Catholic religion, and the greatest of the Protestant. It is governed by its own laws, and seated in a plain, abounding in vineyards and game, on the river Plesure, half a mile from the Rhine. E. Long. 9. 25. N. Lat. 46. 50.

COITION, the intercourse between male and female in the act of generation.

It is observed that frogs are forty days in the act of coition. Bartholine, &c. relate, that butterflies make 130 vibrations of the wings in one act of coition.

COIX, JOB'S-TEARS. See *BOTANY Index*. In Spain and Portugal the poor people grind the seeds of this plant in times of scarcity, and make a coarse kind of bread of them. The seeds are inclosed in small capsules about the bigness of an English pea, and of different colours. These are strung upon silk, and used instead of bracelets by some of the poorer sort in the West Indies, but especially by the negroes.

COKE, or COOKE, SIR EDWARD, lord chief justice of the king's bench in the reign of James I. was descended from an ancient family in Norfolk, and born at Milcham in 149. When he was a student in the Inner-Temple, the first occasion of his distinguishing himself was the stating the case of a cook belonging to the Temple so exactly, that all the house, who were puzzled with it, admired him and his pleading, and the whole bench took notice of him. After his marriage with a lady of a great fortune, preferments flowed in upon him. The cities of Norwich and Coventry chose him for their recorder; the county of Norfolk, for one of their knights in parliament; and the house of commons, for their speaker, in the 35th year of Queen Elizabeth. The queen appointed him solicitor-general in 1592, and attorney-general the next year. In 1603, he was knighted by King James I.; and in November the same year, upon the trial of Sir Walter Raleigh, &c. at Winchester, he treated that gentleman with a scurrility of language hardly to be paralleled. June 27. he was appointed lord chief justice of the common pleas; and in 1613, lord chief justice of the king's bench, and sworn one of the privy council. In 1615, he was very vigorous in the discovery and prosecution of the persons employed in poisoning

Coinage
||
Coke.

Sir

Cokenhausen
||
Colbert.

Sir Thomas Overbury in the Tower in 1612. His contest not long after with the lord chancellor Egerton, with some other cases, hastened the ruin of his interest at court; so that he was sequestered from the council-table and the office of lord chief justice. In 1621, he vigorously maintained in the house of commons, that no proclamation is of any force against the parliament. The same year, being looked upon as one of the great incendiaries in the house of commons, he was removed from the council of state with disgrace; the king saying, that "he was the fittest instrument for a tyrant that ever was in England:" he was also committed to the Tower, and his papers were seized. Upon the calling of a new parliament in 1625, the court-party, to prevent his being elected a member, got him appointed sheriff of Buckinghamshire; to avoid the office, if possible, he drew up exceptions against the oath of a sheriff, but was obliged to undertake the office. In 1628 he spoke vigorously upon grievances, and made a speech, in which he affirmed, that "the duke of Buckingham was the cause of all our miseries." While he lay upon his death-bed, his papers and last will were seized by an order of council. He died in 1634, and published many works: the most remarkable are his Institutes of the laws of England; the first part of which is only a translation and comment of Sir Thomas Littleton, one of the chief justices of the common pleas in the reign of Edward IV.

COKENHAUSEN, a strong town of Livonia in Russia on the river Dwina. E. Long. 25. 50. N. Lat. 56. 30.

COL, one of the western islands of Scotland, which is annexed to the county of Argyle. It is 13 miles long, and 9 broad. It abounds in corn, pasture, salmon, eels, and cod. The inhabitants are chiefly employed in the fisheries. W. Long. 7. 15. N. Lat. 57.

COLAPIS, COLOPS, in *Ancient Geography*, a river of Liburnia, which after a winding north-east course, falls into the Savus, at the Infula Segeftica. Now the *Culpe*, the boundary of the Alps, running through Croatia into the Save. Colapiani, the people living on it (Pliny).

COLARBASIANS, or COLORBASIANS, a set of Christians in the second century; so called from their leader Colarbasus, a disciple of Valentinus; who, with Marcus, another disciple of the same master, maintained the whole plenitude and perfection of truth and religion to be contained in the Greek alphabet; and that it was upon this account that Jesus Christ was called the *alpha* and *omega*. This sect was a branch of the Valentinians. See also MARCOSIANS.

COLBERG, a strong, handsome sea-port town of Germany, in Pomerania, belonging to the king of Prussia. It is remarkable for its salt works; and is seated at the mouth of the river Persant, on the Baltic sea, 60 miles north-east of Stetin, and 30 north-east of Camin. It was taken by the Russians in 1761, but restored at the subsequent peace. E. Long. 15. 39. N. Lat. 54. 21.

COLBERT, JOHN BAPTIST, marquis of Segnelai, one of the greatest statesmen that France ever had, was born at Paris in 1619; and descended from a family that lived at Rheims in Champagne, no way considerable for its splendour and antiquity. His

grandfather is said to have been a wine merchant, and his father at first followed the same occupation; but afterwards became clerk to a notary. In 1648, his relation John Baptist Colbert, lord of S. Pouange, preferred him to the service of Michael le Tellier, secretary of state, whose sister he had married; and here he discovered such diligence, and exactness in executing all the commissions that were entrusted to his care, that he quickly grew distinguished. One day his master sent him to Cardinal Mazarine, who was then at Sedan, with a letter written by the queen-mother; and ordered him to bring it back, after that minister had seen it. Colbert carried the letter, and would not return without it, though the cardinal treated him roughly, used several arts to deceive him, and obliged him to wait for it several days. Some time after, the cardinal returning to court, and wanting one to write his agenda or memoranda, desired Le Tellier to furnish him with a fit person for that employment: and Colbert being presented to him, the cardinal had some remembrance of him, and desired to know where he had seen him. Colbert was afraid of putting him in mind of Sedan, lest the remembrance of his importunacy, in demanding the queen's letter, should renew the cardinal's anger. But his eminency was so far from hating him for his faithfulness to his late master, that he received him, on condition that he should serve him with the like zeal and fidelity.

Colbert applied himself wholly to the advancement of his master's interests, and gave him so many marks of his diligence and skill, that afterwards he made him his intendant. He accommodated himself so dexterously to the inclinations of that minister, by retrenching his superfluous expences, that he was entrusted with the management of that gainful trade of selling benefices and governments. It was by Colbert's counsel, that the cardinal obliged the governors of frontier places to maintain their garrisons with the contributions they exacted; with which advice his eminency was extremely pleased. He was sent to Rome to negotiate the reconciliation of Cardinal de Rets, for which the pope had showed some concern; and to persuade his holiness to consent to the disincamerating of Casto, according to the treaty concluded with his predecessor Urban VIII. Upon the whole, Mazarine had so high an opinion of Colbert's abilities, and withal such a regard for his faithful services, that at his death, which happened in 1661, he earnestly recommended him to Louis XIV. as the properest person to regulate the finances, which at that time stood in much need of reformation. Louis accepted the recommendation, and made Colbert intendant of the finances. He applied himself to their regulation, and succeeded, though it procured him many enemies, and some affronts. France is also obliged to this minister for establishing at that time her trade with the East and West Indies: a great design, and from which she has reaped innumerable advantages.

In 1664, he became superintendent of the buildings; and from that time applied himself so earnestly to the enlarging and adorning of the royal edifices, that they are at present so many masterpieces of architecture: witness the palace of the Thuilleries, the Louvre, St Germain, Fountainbleau, and Chambord. As for Versailles, it may be said that he raised it from the ground.

Colbert.

ground. It was formerly a dog-kennel, where Louis XIII. kept his hunting furniture: it is now a palace fit for the greatest monarch. But royal palaces were not Colbert's only care: he formed several designs for increasing the beauty and convenience of the capital city, and he did it with great magnificence and grandeur. The public was obliged to this same minister for the establishment of the academy for painting and sculpture in 1664. The king's painters and sculptors, with other skilful professors of those arts, being prosecuted at law by the master-painters at Paris, joined together, and began to form a society, under the name of the Royal Academy for Sculpture and Painting. Their design was to keep public exercises, for the sake of improving those fine arts, and advancing them to the highest degree of perfection. They put themselves under the protection of Mazarine, and chose Chancellor Seguier their vice-protector; and after Mazarine's death chose Seguier their protector, and Colbert their vice-protector. It was at his solicitation that they were finally established by a patent, containing new privileges, in 1664. Colbert, being made protector after the death of Seguier, thought fit that a historiographer should be appointed, whose business it should be to collect all curious and useful observations that might be made at their conferences. This was accordingly done; and his majesty was pleased to settle on him a salary of 300 livres. To Colbert also the lovers of naval knowledge are obliged for the erection of the Academy of Sciences, for the making of which the more useful, he caused to be erected, in 1667, the royal observatory at Paris, which was first inhabited by Cassini. But these are not the only obligations France has to that minister. She owes to him all the advantages she receives by the union of the two seas; a prodigious work, begun in 1666 and finished in 1680. Colbert was also very intent upon matters of a more private nature, such as regarded the order, decency, and well-being of society. He undertook to reform the courts of justice, and to put a stop to the usurpation of noble titles, which it seems was then very common in France. In the former of these attempts he failed, in the latter he succeeded.

In 1669, he was made secretary of state, and entrusted with the management of affairs relating to the sea; and his performances in this province were answerable to the confidence his majesty reposed in him. He suppressed several offices, which were chargeable, but useless; and in the mean time, perceiving the king's zeal for the extirpation of heresy, he shut up the chamber instituted by the edicts of Paris and Roan. He proposed several new regulations concerning criminal courts, and was extremely severe with the parliament of Thoulouse for obstructing the measures he took to carry the same into execution. His main design in reforming the tedious methods of proceeding at law, was to give the people more leisure to apply themselves to trading; for the advancement of which he procured an edict, to erect a general insurance-office at Paris, for merchants, &c. In 1672, he was made minister of state; for how busied soever he was in the regulation of public affairs, yet he never neglected his own or his family's interest and grandeur, or missed any opportunity of advancing either. He had been mar-

ried many years, had sons and daughters grown up, all of which, as occasion served, he took care to marry to great persons. For though he had no reason to doubt of his master's favour, yet he wisely secured his fortune by powerful alliances. However, business was certainly Colbert's natural turn, and he not only loved it, but was very impatient to be interrupted in it, as the following anecdote may serve to show. A lady of great quality was one day urging him, when he was in the height of his power, to do her some piece of service, and perceiving him inattentive and inflexible, threw herself at his feet, in the presence of above 100 persons, crying, "I beg your greatness, in the name of God, to grant me this favour." Upon which Colbert, kneeling down over against her, replied, in the same mournful tone, "I conjure you, madam, in the name of God, not to disturb me."

This great minister died of the stone, September 6. 1683, in his 65th year, leaving behind him six sons and three daughters. He was of a middle stature, rather lean than fat. His mien was low and dejected, his air gloomy, and his aspect stern. He slept little, and was very sober. Though naturally sour and morose, he knew how to act the lover, and had mistresses. He was of a slow conception, but spoke judiciously of every thing after he had once comprehended it. He understood business perfectly well, and he pursued it with unwearied application. Thus he filled the most important places with high reputation and credit; and his influence diffused itself through every part of the government. He restored the finances, the navy, the commerce; and he erected those various works of art, which have ever since been monuments of his taste and magnificence. He was a lover of learning, though he never applied to it himself; and therefore conferred donations and pensions upon scholars in other countries, while he established and protected academies in his own. He invited into France painters, statuaries, mathematicians, and artists of all kinds, who were any way eminent, thus giving new life to the sciences, and making them flourish, as they did, exceedingly. Upon the whole, he was a wise, active, generous-spirited minister; ever attentive to the interests of his master, the happiness of the people, the progress of arts and manufactures, and in short to every thing that could advance the credit and interest of his country. He was a pattern for all ministers of state; and every nation may wish themselves blessed with a Colbert.

COLCHESTER, the chief town of Essex, is pleasantly situated upon an eminence, gradually rising on the south side of the river Colne. It is the ancient *Colonia Camulodunum*, from which word, *Colonia*, both the town and the river Colne received their names. The Saxons called it Colneceaster. That it flourished under the Romans, several buildings full of their bricks, and innumerable quantities of coin dug in and about it, fully evince. In the year 1763, a curious tessellated or mosaic pavement was found in a garden three feet under the surface of the earth. The emperor Constantine the Great was born here, his mother Helen being daughter of Cool, governor or king of this district under the Romans. She is said to have found out the cross of Christ at Jerusalem; and on that ac-

Colbert,
Colchester.

Colchester count the arms of this town are a cross regulee between three ducal coronets, two in chief and one in base, the coronet in base passing through the cross.

The walls of the town are still tolerably entire on the south, east, and west sides, but much decayed on the north side; they are generally about nine feet thick. By a statute of Henry VIII. this town was made the see of a suffragan bishop.

This town is the most noted in England for making of baize; it is also of special note for candying the eringo roots, and for oysters.

In the conclusion of the civil war 1648, this town sustained a severe siege of 10 weeks; and the besieged making a very gallant defence, it was changed into a blockade, wherein the garrison and inhabitants suffered the utmost extremity of hunger, being reduced to the necessity of eating horse-flesh, dogs, and cats, and were at last obliged to surrender at discretion, when their two valiant chief officers, Sir Charles Lucas, and Sir George Lisle, were shot under the castle walls in cold blood. Colchester is a borough by prescription, and under that right sends two members to parliament, all their charters being silent on that head. The charter was renewed in 1763. The town is now governed by a mayor, recorder, 12 aldermen, 18 assistants, 18 common-council men. Quarter sessions are held here four times in the year.

The famous abbey gate of St John is still standing, and allowed to be a surprising, curious, and beautiful piece of Gothic architecture, great numbers of persons coming from distant places to see it. It was built, together with the abbey, in 1097; and Gudo, steward to King William Rufus, laid the first stone.

St Ann's chapel, standing at the east end of the town, is valuable in the esteem of antiquarians as a building of great note in the early days of Christianity, and made no small figure in history many centuries past. It is still pretty entire. St Botoph's priory was founded by Ernulphus, in the reign of Henry I. in the year 1110. It was demolished in the wars of Charles I. by the parliament army under Sir Thomas Fairfax. The ruins still exhibit a beautiful sketch of ancient masonry, much admired by the lovers of antiquities. The castle is still pretty entire, and is a magnificent structure, in which great improvements have of late been made. Here is an excellent and valuable library.

The markets, which are on Wednesday and Saturday, are very well supplied with all kinds of provisions. There are no fewer than six dissenting meeting-houses in this town. Colchester is 51 miles from London, and 22 ENE of Chelmsford. It had 16 parish churches, in and out of the walls, only 12 of which are now used, the rest being damaged at the siege in 1648. E. Long. 1. 0. N. Lat. 51. 55.

COLCHI (Arrian, Ptolemy), a town of the Hither India, thought to be *Cochin*, on the coast of Malabar; now a factory and strong fort of the Dutch. E. Long. 75. 0. N. Lat. 10. 0.

COLCHICUM, MEADOW-SAFFRON. See BOTANY Index.

COLCHIS, a country of Asia, at the south of Asiatic Sarmatia, east of the Euxine sea, north of Armenia, and west of Iberia. It is famous for the expedition of the Argonauts, and as the birth-place of Me-

dea. It was fruitful in poisonous herbs, and produced excellent flax. The inhabitants were originally Egyptians, who settled there when Sesostris king of Egypt extended his conquests in the north.

COLCOTHAR, the substance remaining after the distillation or calcination of martial vitriol or sulphate of iron. See CHEMISTRY Index.

COLD, in a relative sense, signifies the sensation produced by the abstraction of heat from the body.

The nature of cold, and the methods of producing it artificially, have been treated of under the article CHEMISTRY, to which we refer the reader.

Great degrees of cold occur naturally in many parts of the globe in the winter-time. In the winter of 1780, Mr Wilson of Glasgow observed, that a thermometer laid on the snow sunk to 25° below 0; but this was only for a short time; and in general our atmosphere does not admit of very great degrees of cold for any length of time. In 1752, the thermometer at Petersburg stood at 28° below 0; and in 1737, when the French academicians wintered at the north polar circle, or near it, the thermometer sunk to 33° below 0; and in the Asiatic and American continent, still greater degrees of cold are very common.

The effects of these extreme degrees of cold are very surprising. Trees are burst, rocks rent, and rivers and lakes frozen several feet deep; metallic substances blister the skin like red-hot iron: the air, when drawn in by respiration, hurts the lungs, and excites a cough: even the effects of fire in a great measure seem to cease; and it is observed, that though metals are kept for a considerable time before a strong fire, they will still freeze water when thrown upon them. When the French mathematicians wintered at Torneo in Lapland, the external air, when suddenly admitted into their rooms, converted the moisture of the air into whirls of snow; their breaths seemed to be rent when they breathed it, and the contact of it was intolerable to their bodies; and the alcohol, which had not been highly rectified, burst some of their thermometers by the congelation of the aqueous part.

Extreme cold very often proves fatal to animals in those countries where the winters are very severe; and thus 7000 Swedes perished at once in attempting to pass the mountains which divide Norway from Sweden. It is not necessary, indeed, that the cold, in order to prove fatal to the human life, should be so very intense as has been just mentioned. There is only requisite a degree somewhat below 32° of Fahrenheit, accompanied with snow or hail, from which shelter cannot be obtained. The snow which falls upon the clothes, or the uncovered parts of the body, then melts, and by a continual evaporation carries off the animal heat to such a degree, that a sufficient quantity is not left for the support of life. In such cases, the person first feels himself extremely chill and uneasy; he begins to turn listless, unwilling to walk or use exercise to keep himself warm; and at last turns drowsy, sits down to refresh himself with sleep, but wakes no more. An instance of this was seen not many years ago at Terra del Fuego, where Dr Solander, with some others, having taken an excursion up the country, the cold was so intense, that one of their number died. The Doctor himself, though he had warned his companions of the

Colcothar,
Cold.

^{Cold}
^{||}
^{Cold-finch.} the danger of sleeping in that situation, yet could not be prevented from making that dangerous experiment himself; and though he was awaked with all possible expedition, his body was so much shrunk in bulk, that his shoes fell off his feet, and it was with the utmost difficulty that he was recovered.

In those parts of the world where vast masses of ice are produced, the accumulation of it, by absorbing the heat of the atmosphere, occasions an absolute sterility in the adjacent countries, as is particularly the case with the island of Iceland, where the vast collections of ice floating out from the Northern ocean, and stopped on that coast, are sometimes several years in thawing. Indeed, where great quantities of ice are collected, it would seem to have a power like fire, both augmenting its own cold and that of the adjacent bodies. An instance of this is related under the article *EVAPORATION*, in Mr Wedgewood's experiment, where the true cause of this phenomenon is also pointed out.

COLD, in *Medicine*. See *MEDICINE Index*.

COLD. See *FARRIERY Index*.

COLDENIA. See *BOTANY Index*.

COLDINGHAM, supposed to be the *Colonia* of Ptolemy, and called by Bede the city Coldana and of Colud (*Coludum*), situated on the borders of Scotland, about two miles from Eyemouth, was a place famous many ages ago for its convent. This was the oldest nunnery in Scotland, for here the virgin-wife Etheldreda took the veil in 670; but by the ancient name *Coludum* it should seem that it had before been inhabited by the religious called *Culdees*. In 870 it was destroyed by the Danes, but its name rendered immortal by the heroism of its nuns; who, to preserve themselves inviolate from those invaders, cut off their lips and noses; and thus rendering themselves objects of horror, were, with their abbess Ebba, burnt in the monastery by the disappointed savages. After this it lay deserted till the year 1098, when King Edgar founded on its site a priory of Benedictines in honour of St Cuthbert, and bestowed it on the monks of Durham.

Mr Pennant's description of the black, joyless, heathy moor, where it was situated, might be sufficient to guard the fair inhabitants of the nunnery were it still subsisting. That description, however, is now altogether inapplicable: The whole tract, five miles over, has been since improved, and converted into corn fields; the cheerless village of Old Cambus is no more; a decent inn with good accommodations has been established at a convenient distance; and the passage of the steep glen called the *Pease*, which terminates the moor on the road towards Edinburgh, and was formerly the terror of travellers, is now rendered safe and easy by means of a bridge extending from one side of the chasm to the other.

COLDINGUEN, a town of Denmark, in North Jutland, and diocese of Ripen. It is remarkable for its bridge, over which pass all the oxen and other cattle that go from Jutland into Germany, which brings in a considerable revenue to the king. It is seated on an eminence, in a pleasant country abounding with game. E. Long. 9. 25. N. Lat. 55. 35.

COLD-FINCH, a species of *MOTACILLA*. See *ORNITHOLOGY Index*.

COLD-SHIRE IRON, that which is brittle when cold.

COLE, WILLIAM, the most famous botanist of his time, was born at Adderbury in Oxfordshire about the year 1626, and studied at Merton college in Oxford. He at length removed to Putney, near London; and published "The Art of Simpling; and Adam in Eden, or Nature's Paradise." Upon the restoration of King Charles II. he was made secretary to Dr Duppa, bishop of Winchester; but died two years after, aged 37.

COLE-FISH, a species of *GADUS*. See *ICHTHYOLOGY Index*.

COLE-Seed, the seed of the *napus sativa*, or long-rooted, narrow-leaved rapa, called in English *navew*, and reckoned by Linnæus among the brassicas, or cabbage kind. See *BRASSICA*.

This plant is cultivated to great advantage in many parts of England, on account of the rape oil expressed from its seeds. The practice of sowing it was first introduced by the Germans and Dutchmen who drained the fens of Lincolnshire; and hence the notion hath generally prevailed, that it will thrive only in a marshy soil; but this is now found to be a mistake. In preparing the land which is to receive it, care must be taken to plow it in May, and again about midsummer, making the ground as fine and even as possible. It is to be sown the very day of the last plowing, about a gallon on an acre. In the months of January, February, and March, it affords very good food for cattle, and will sprout again when cut; after which it is excellent nourishment for sheep. After all, if it is not too closely fed, it will bear feed against next July. The same caution, however, is requisite with this food as with clover, till cattle are accustomed to it, otherwise it is apt to swell them. When this plant is cultivated solely with a view to the seed, it must be sown on deep strong land without dung, and must be suffered to stand till one-half of the seeds at least are turned brown; which, according to the seasons, will be sometimes sooner, sometimes later. In this state it is to be cut in the same manner and with the same care as wheat; and every handful as it is cut is to be regularly ranged on sheets, that it may dry leisurely in the sun, which will commonly be in a fortnight; after which it is to be carefully threshed out, and carried to the mill for expressing the oil. The produce of cole-seed is generally from five to eight quarters on an acre; and is commonly sold at 20s. per quarter.

COLEOPTERA, or *BEEBLE*, the name of Linnæus's first order of insects. See *ENTOMOLOGY Index*.

COLEWORT. See *BRASSICA*.

COLERAIN, a large town of Ireland, in the county of Londonderry and province of Ulster; seated on the river Bann, four miles south of the ocean, in W. Long. 7. 2. N. Lat. 55. 10. It was formerly a place of great consideration, being the chief town of a county erected by Sir John Perrot, during his government of Ireland; whereas it is now only the head of one of the baronies in the county of Londonderry; but it is still a corporation, and sends two members to parliament. It is of a tolerable size, and very elegantly built. The port is very indifferent, occasioned by the extreme rapidity of the river, which repels the

Coles,
Colet.

tide, and makes the coming up to the town difficult; so that it has but little trade, and might perhaps have less, if it was not for the valuable salmon-fishery, which amounts to some thousand pounds a-year. If the navigation of the Bann could be opened, which is totally obstructed by a ridge of rocks, it would quickly change the face of things; for then, by the help of this river, and the Newry canal, there would be a direct communication across the kingdom, and, with the assistance of the Black-water river, which likewise falls into Lough Neagh, almost all the counties of the province of Ulster might have a correspondence with each other by water-carriage, to their reciprocal and very great emolument.

COLES, ELISHA, author of the well known Latin and English dictionary, was born in Northamptonshire about the year 1640; and was entered of Magdalene College Oxford, which he left without taking a degree; and taught Latin to young people, and English to foreigners, in London, about the year 1663. He afterwards became an usher in Merchant-tailors school; but for some great fault, nowhere expressly mentioned, he was forced to withdraw to Ireland, whence he never returned. He was, however, a good critic in the English and Latin tongues; and wrote several useful books of instruction in his profession.

COLET, JOHN, dean of St Paul's, the son of Henry Colet knight, was born in London in the year 1466. His education began in St Anthony's school in that city, from whence, in 1483, he was sent to Oxford, and probably to Magdalene college. After seven years study of logic and philosophy, he took his degrees in arts. About the year 1493, Mr Colet went to Paris, and thence to Italy, probably with a design to improve himself in the Greek and Latin languages, which at this time were imperfectly taught in our universities. On his return to England in 1497, he took orders; and returned to Oxford, where he read lectures *gratis*, on the epistles of St Paul. At this time he possessed the rectory of St Dennington in Suffolk, to which he had been instituted at the age of 19. He was also prebendary of York, and canon of St Martin's le Grand in London. In 1502 he became prebendary of Sarum; prebendary of St Paul's in 1505; and immediately after dean of that cathedral, having previously taken the degree of doctor of divinity. He was no sooner raised to this dignity, than he introduced the practice of preaching and expounding the scriptures; and soon after established a perpetual divinity lecture in St Paul's church, three days in every week; an institution which gradually made way for the reformation. About the year 1508, Dean Colet formed his plan for the foundation of St Paul's school, which he completed in 1512, and endowed with estates to the amount of 122l. and upwards. The celebrated grammarian, William Lyle, was his first master, and the company of mercers were appointed trustees. The dean's notions of religion were so much more rational than those of his contemporary priests, that they deemed him little better than a heretic; and on that account he was so frequently molested, that he at last determined to spend the rest of his days in peaceful retirement. With this intention he built a house near the palace at Richmond; but, being seized with the sweating sickness, he died in 1519, in the 53d year of his age. He was buried

on the south side of the choir of St Paul's; and a stone was laid over his grave, with no other inscription than his name. Besides the preferments above mentioned, he was rector of the guild of Jesus at St Paul's, and chaplain to King Henry VIII. Dean Colet, though a Papist, was an enemy to the gross superstitions of the church of Rome. He disapproved auricular confession, the celibacy of the priests, and such other ridiculous tenets and ceremonies as have ever been condemned by men of sound understanding in every age and country. He wrote, 1. *Rudimenta grammatices*. 2. The construction of the eight parts of speech. 3. Daily devotions. 4. *Epistola ad Erasmus*. 5. Several sermons: and other works which still remain in manuscript.

COLIBERTS (*Coliberti*), in *Law*, were tenants in soccage, and particularly such villeins as were manumitted or made freemen. But they had not an absolute freedom; for though they were better than servants, yet they had superior lords to whom they paid certain duties, and in that respect might be called servants, though they were of middle condition between freemen and servants.

COLIC, a severe pain in the lower venter, so called because the colon was formerly supposed to be the part affected. See *MEDICINE-Index*.

COLIC, in *Ferriery*. See *FARRIERY Index*.

COLIGNI, GASPARD DE, admiral of France, was born in 1516. He signalized himself in his youth, in the reigns of Francis I. and Henry II. and was made colonel of infantry and admiral of France in 1552. Henry II. employed him in the most important affairs; but after the death of that prince, he embraced the reformed religion, and became the chief of the Protestant party: he strongly opposed the house of Guise, and rendered this opposition so powerful, that it was thought he would have overturned the French government. On the peace made after the battles of Jarnac and Montcontour, Charles IX. deluded Coligni into security by his deceitful favours; and though he recovered one attempt on his life, when he attended the nuptials of the prince of Navarre, yet he was included in the dreadful massacre of the Protestants on St Bartholomew's day 1572, and his body treated with wanton brutality by a misguided Popish populace.

COLIMA, a sea-port town of Mexico in North America, and capital of a fertile valley of the same name. It is seated at the mouth of a river, in W. Long. 109. 6. N. Lat. 18. 30.

COLIOURE, a small, but ancient and strong town of France, in Roussillon, seated at the foot of the Pyrenean mountains, with a small harbour. E. Long. 3. 10. N. Lat. 43. 24.

COLIR, an officer in China, who may properly be called an inspector, having an eye over what passes in every court or tribunal of the empire. In order to render him impartial, he is kept independent, by having his post for life. The power of the colirs is such, that they make even the princes of the blood tremble.

COLISEUM, or COLISÆUM, in the ancient architecture, an oval amphitheatre, built at Rome by Vespasian, in the place where stood the basin of Nero's gilded house. The word is formed from *colosseum* on account of the colossus of Nero that stood near it;

or,

Coliberts
||
Coliseum.

Collaert
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Collateral.

or, according to Nardini, from the Italian *coliseo*. In this were placed statues, representing all the provinces of the empire; in the middle whereof stood that of Rome, holding a golden apple in her hand. The same term, *coliseum*, is also given to another amphitheatre of the emperor Severus. In these *colisea* were represented games, and combats of men and wild beasts; but there is now little remaining of either of them, time and war having reduced them to ruins.

COLLAERT, ADRIAN, an eminent engraver who flourished about 1550, was born at Antwerp. After having learned in his own country the first principles of engraving, he went to Italy, where he resided some time to perfect himself in drawing. He wrought entirely with the graver, in a firm neat style, but rather stiff and dry. The vast number of plates executed by his hand sufficiently evince the facility with which he engraved; and though exceedingly neat, yet they are seldom highly finished.

COLLAERT, Hans or John, son to the foregoing, was also an excellent artist. He drew and engraved exactly in the style of his father, and was in every respect equal to him in merit. He must have been very old when he died; for his prints are dated from 1555 to 1622. He assisted his father in all his great works, and engraved besides a prodigious number of plates of various subjects. One of his best prints is *Moses striking the rock*, a large print, lengthwise, from Lambert Lombard. A great number of small figures are introduced into this print; and they are admirably well executed: the heads are fine, and the drawing very correct.

COLLAR, in Roman antiquity, a sort of chain put generally round the neck of slaves that had run away, after they were taken, with an inscription round it, intimating their being deserters, and requiring their being restored to their proper owners, &c.

COLLAR, in a more modern sense, an ornament consisting of a chain of gold, enamelled, frequently set with ciphers or other devices, with the badge of the order hanging at the bottom, wore by the knights of several military orders over their shoulders, on the mantle, and its figure drawn round their armories.

Thus, the collar of the order of the garter consists of S. S. with roses enamelled red, within a garter enamelled blue, and the George at the bottom.

Lord Mayor's COLLAR is more usually called chain. See CHAIN.

Knights of the COLLAR, a military order in the republic of Venice, called also the order of St Mark, or the medal. It is the doge and the senate that confer this order; the knights bear no particular habit, only the collar, which the doge puts around their neck, with a medal, wherein is represented the winged lion of the republic.

COLLAR of a Draught-horse, a part of harness made of leather and canvas, and stuffed with straw or wool, to be put about the horse's neck.

COLLARAGE, a tax or fine laid for the collars of wine-drawing horses.

COLLATERAL, any thing, place, country, &c. situated by the side of another.

COLLATERAL, in genealogy, those relations which proceed from the same stock, but not in the same line of ascendants or descendants, but being, as it were, aside

of each other. Thus, uncles, aunts, nephews, nieces, and cousins, are collaterals, or in the same collateral line: those in a higher degree, and nearer the common root, represent a kind of paternity with regard to those more remote. See CONSANGUINITY.

COLLATERAL Succession. When a defunct, for want of heirs descended of himself, is succeeded in his estate by a brother or sister, or their descendants, the estate is said to have gone to *collateral heirs*.

COLLATIA, in *Ancient Geography*, a town of the Sabines, thought to be distant between four or five miles from Rome to the east; situated on an eminence (Virgil). Of this place was Tarquinius Collatinus, married to Lucretia, ravished by Sextus Tarquinius (Livy); situated on this or on the left side of the Anio (Pliny). Extant in Cicero's time, but in Strabo's day only a village; now no trace of it remains.—Another supposed *Collatia* of Apulia, near Mount Garganus, because Pliny mentions the *Collatini* in Apulia, and Frontinus the *Ager Collatinus*.

COLLATINA PORTA, a gate of Rome, at the Collis Hortulorum, afterwards called *Pinciana*, from the Pincii, a noble family. Its name *Collatina* is from *Collatia*, to the right of which was the Via Collatina, which led to that town.

COLLINA, a gate of Rome at the Collis Quirinalis, not far from the temple of Venus Erycina (Ovid); called also *Salaria*, because the Sabines carried their salt through it (Tacitus). Now *Salarno*.

COLLATION, in the canon law, the giving or bestowing of a benefice on a clergyman by a bishop, who has it in his own gift or patronage. It differs from institution in this, that institution is performed by the bishop, upon the presentation of another; and collation is his own gift of presentation; and it differs from a common presentation, as it is the giving of the church to the person, and presentation is the giving or offering of the person to the church. But collation supplies the place of presentation and institution, and amounts to the same as institution where the bishop is both patron and ordinary. Anciently the right of presentation to all churches was in the bishop; and now if the patron neglects to present to a church, this right returns to the bishop by collation. If the bishop neglects to collate within six months after the elapse of the patron, then the archbishop hath a right to do it; and if the archbishop neglects, then it devolves to the king; the one as superior, to supply the defects of bishops, the other as supreme, to supply all defects of government.

COLLATION, in common law, the comparison or presentation of a copy to its original, to see whether or not it be conformable; or the report or act of the officer who made the comparison. A collated act is equivalent to its original, provided all the parties concerned were present at the collation.

COLLATION, in *Scots Law*, that right which an heir has of throwing the whole heritable and moveable estates of the deceased into one mass, and sharing it equally with the others in the same degree of kindred, when he thinks such share will be more than the value of the heritage to which he had an exclusive title.

COLLATION is also used among the Romanists for the meal or repast made on a fast-day, in lieu of a supper. Only fruits are allowed in a collation: F. Lobi-

Collateral
||
Collation.

Collation
||
Collecto.

neau observes, that anciently there was not allowed even bread in the collations in Lent, nor any thing beside a few comfits and dried herbs and fruits; which custom, he adds, obtained till the year 1513. Cardinal Humbert observes further, that in the middle of the 11th century there were no collations at all allowed in the Latin church in the time of Lent; and that the custom of collations was borrowed from the Greeks, who themselves did not take it up till about the 11th century.

COLLATION is also popularly used for a repast between meals, particularly between dinner and supper. The word collation, in this sense, Du Cange derives from *collocutio*, "conference," and maintains, that originally collation was only a conference, or conversation on subjects of piety, held on fast-days in monasteries; but that, by degrees, the custom was introduced of bringing in a few refreshments; and that by the excesses to which those sober repasts were at length carried, the name of the abuse was retained, but that of the thing lost.

Collation of Seals, denotes one seal set on the same label, on the reverse of another.

COLLEAGUE, a partner or associate in the same office or magistrature. See ADJUNCT.

COLLECT, COLLECTION, a voluntary gathering of money, for some pious or charitable purpose. Some say, the name *collect*, or *collection*, was used, by reason those gatherings were anciently made on the days of *collects*, and in *collects*, i. e. in assemblies of Christians; but, more probably, *quia colligebatur pecunia*.

COLLECT, is sometimes also used for a tax, or imposition, raised by a prince for any pious design. Thus, historians say, that in 1166, the king of England coming into Normandy, appointed a collect for the relief of the holy land, at the desire and after the example of the king of France. See CROISADE.

COLLECT, in the liturgy of the church of England, and the mass of the Romanists, denotes a prayer accommodated to any particular day, occasion, or the like. See LITURGY and MASS.

In the general, all the prayers in each office are called *collects*; either because the priest speaks in the name of the whole assembly, whose sentiments and desires he sums up by the word *oremus*, "let us pray," as is observed by Pope Innocent III. or, because those prayers are offered when the people are assembled together, which is the opinion of Pamelius on Tertullian.

The congregation itself is in some ancient authors called *collect*. The popes Gelasius and Gregory are said to have been the first who established *collects*. Despence, a doctor of the faculty of Paris, has an express treatise on *collects*, their origin, antiquity, authors, &c.

COLLECTIVE, among grammarians, a term applied to a noun expressing a multitude, though itself be only singular; as an army, company, troop, &c. called *collective nouns*.

COLLECTOR, in general, denotes a person who gets or brings together things formerly dispersed and separated. Hence,

COLLECTOR, in matters of civil polity, is a person appointed by the commissioners of any duty, the inha-

bitants of a parish, &c. to raise or gather any kind of tax.

COLLECTOR, among botanists, one who gets together as many plants as he can, without studying botany in a scientific manner.

COLLEGATORY, in the *Civil Law*, a person who has a legacy left him in common with one or more other persons.

COLLEGE, an assemblage of several bodies or societies, or of several persons into one society.

College, among the Romans, served indifferently for those employed in the offices of religion, of government, the liberal and even mechanical arts and trades; so that, with them, the word signified what we call a corporation or company.

In the Roman empire, there were not only the *college of augurs*, and the *college of capitolini*, i. e. of those who had the superintendance of the capitoline games; but also colleges of artificers, *collegia artificum*; college of carpenters, *fabricorum*, or *fabrorum tignariorum*; of potters, *figulorum*; of founders, *arariorum*; the college of locksmiths, *fabrorum ferrariorum*; of engineers of the army, *tignariorum*; of butchers, *laniorum*; of dendrophori, *dendrophororum*; of centonaries, *centonariorum*; of makers of military casques, *flagariorum*; of tent-makers, *tabernaculariorum*; of bakers, *pistorum*; of musicians, *tibicinum*, &c. Plutarch observes, that it was Numa who first divided the people into colleges, which he did to the end that each consulting the interests of their college, whereby they were divided from the citizens of the other colleges, they might not enter into any general conspiracy against the public repose.

Each of these colleges had distinct meeting places or halls; and likewise, in imitation of the state, a treasury and common chest, a register, and one to represent them, upon public occasions, and acts of government. These colleges had the privilege of manumitting slaves, of being legates, and making by-laws for their own body, provided they did not clash with those of the government.

There are various colleges on foot among the moderns, founded on the model of those of the ancients. Such are the three colleges of the empire, viz.

COLLEGE of Electors, or their Deputies, assembled in the diet of Ratisbon.

COLLEGE of Princes; the body of princes, or their deputies at the diet of Ratisbon.

COLLEGE of Cities, is, in like manner, the body of deputies which the imperial cities send to the diet.

COLLEGE of Cardinals, or the *Sacred COLLEGE*; a body composed of the three orders of cardinals. See CARDINALS.

COLLEGE is also used for a public place endowed with certain revenues, where the several parts of learning are taught.

An assemblage of several of these colleges constitutes an university. The erection of colleges is part of the royal prerogative, and not to be done without the king's license.

The establishment of colleges or universities is a remarkable period in literary history. The schools in cathedrals and monasteries confined themselves chiefly to the teaching of grammar. There were only

Collector
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College.

College. ly one or two masters employed in that office. But, in colleges, professors are appointed to teach all the different parts of science. The first obscure mention of academical degrees in the university of Paris (from which the other universities in Europe have borrowed most of their customs and institutions), occurs A. D. 1215.

COLLEGE of Civilians, commonly called *Doctors Commons*; a college founded by Dr Harvey, dean of the arches, for the professors of the civil law residing in London; where usually, likewise, reside the judge of the arches court of Canterbury, judge of the admiralty, of the prerogative court, &c. with other civilians; who all live, as to diet and lodging, in a collegiate manner, communing together; whence the appellation of *Doctors Commons*. Their house being consumed in the great fire, they all resided at Exeter-house in the Strand till 1672; when their former house was rebuilt, at their own expence, in a very splendid manner. To this college belong 34 proctors, who make themselves parties for their clients, manage their causes, &c.

COLLEGE of Physicians, a corporation of physicians in London, who, by several charters and acts of parliament of Henry VIII. and his successors, have certain privileges, whereby no man, though a graduate in physic of any university, may, without license under the said college-seal, practise physic in or within seven miles of London; with power to administer oaths, fine and imprison offenders in that and several other particulars; to search the apothecaries shops, &c. in and about London, to see if their drugs, &c. be wholesome, and their compositions according to the form prescribed by the said college in their dispensatory. By the said charter they are also freed from all troublesome offices, as to serve on juries, be constable, keep watch, provide arms, &c.

The society had anciently a college in Knight-riders-street, the gift of Dr Linacre physician to King Henry VIII. Since that time they have had a house built them by the famous Dr Harvey in 1652, at the end of Amen-corner, which he endowed with his whole inheritance in his lifetime; but this being burnt in the great fire in 1666, a new one was erected, at the expence of the fellows, in Warwick-lane, with a noble library, given partly by the marquis of Dorchester, and partly by Sir Theodore Mayerne.

Of this college there are at present a president, four censors, eight electors, a register, and a treasurer, chosen annually in October; the censors have, by charter, power to survey, govern, and arrest, all physicians, or others practising physic, in or within seven miles of London, and to fine, amerce, and imprison them, at discretion. The number of fellows was anciently thirty, till King Charles II. increased their number to forty; and King James II. giving them a new charter, allowed the number of fellows to be enlarged so as not to exceed fourscore; reserving to himself and successors the power of placing and displacing any of them for the future.

The college is not very rigorous in asserting their privileges; there being a great number of physicians, some of very good abilities, who practise in London, &c. without their license, and are connived at by the college; yet, by law, if any person not expressly al-

lowed to practise, take on him the cure of any disease, and the patient die under his hand, it is deemed felony in the practiser. In 1696, the college made a subscription, to the number of forty-two of their members, to set on foot a dispensatory for the relief of the sick poor: since that they have erected two other dispensatories.

Edinburgh COLLEGE of Physicians was erected on the 29th November 1681. The design of this institution was, to prevent the abuses daily committed by foreign and illiterate impostors, quacks, &c. For this reason, his majesty, at the time above mentioned, granted letters patent to erect into a body corporate and politic, certain physicians in Edinburgh and their successors, by the title of "the President and Royal College of Physicians at Edinburgh," with power to choose annually a council of seven, one whereof to be president: these are to elect a treasurer, clerk, and other officers; to have a common seal; to sue and be sued; to make laws for promoting the art of physic, and regulating the practice thereof, within the city of Edinburgh, town of Leith, and districts of the Canongate, Westport, Pleasance, and Potterrow; through all which the jurisdiction of the college extends. Throughout this jurisdiction, no person is allowed to practise physic, without a warrant from the college, under the penalty of 5l. sterling the first month, to be doubled monthly afterwards while the offence is continued; one-half the money arising from such fines to go to the poor, the other to the use of the college. They are also empowered to punish all licentiates in physic within the above-mentioned bounds, for faults committed against the institutions of the college; and to fine them of sums not exceeding 40s. On such occasions, however, they must have one of the baillies of the city to fit in judgment along with them, otherwise their sentence will not be valid. They are also empowered to search and inspect all medicines within their jurisdiction, and throw out into the street all such as are bad or unwholesome. That they may the better attend their patients, they are exempted from watching, warding, and serving on juries. They are, however, restrained from erecting schools for teaching the art of physic, or conferring degrees on any person qualified for the office of a physician; but are obliged to license all such as have taken their degrees in any other university, and to admit as honorary members all the professors of physic in the rest of the universities of Scotland. These privileges and immunities are not, however, to interfere with the rights and privileges of the apothecary surgeons, in their practice of curing wounds, contusions, fractures, and other external operations.

Edinburgh COLLEGE of Surgeons. This is but a very late institution, by which the surgeons of Edinburgh are incorporated into a *Royal College*, and authorized to carry into execution a scheme for making provision for their widows and children, &c. They have also the privilege of examining, and licensing, if found qualified, all practitioners in surgery within certain bounds.

COLLEGE of Justice, the supreme civil court of Scotland; otherwise called *Court of Session*, or, *of Council and Session*. See *LAW Index*.

Sion COLLEGE, or the college of the London clergy; which has been a religious house time out of mind, sometimes

College.

sometimes under the denomination of a priory, sometimes under that of a spital or hospital: at its dissolution under 31st Henry VIII. it was called *Elson's Spital*, from the name of its founder, a mercer, in 1329. At present it is a composition of both, viz. a college for the clergy of London, who were incorporated in 1630, in pursuance to the will of Dr White, under the name of the *President and Fellows of Sion College*; and an hospital for ten poor men and as many women. The officers of the corporation are the president, two deans, and four assistants, who are annually chosen from among the rectors and vicars of London; and are subject to the visitation of the bishop. They have a good library, built and stocked by Mr Simpson, and furnished by several other benefactors, chiefly for the clergy of the city, without excluding other students on certain terms; and a hall, with chambers for students, generally occupied by the ministers of the neighbouring parishes.

Gresham College, or *College of Philosophy*; a college founded by Sir Thomas Gresham, and endowed with the revenue of the Royal Exchange. One moiety of this endowment the founder bequeathed to the mayor and aldermen of London and their successors, in trust, that they should find four able persons to read, within the college, divinity, geometry, astronomy, and music; who are chosen by a committee of the common council, consisting of the lord mayor, three aldermen, and eight commoners, and allowed each, besides lodging, 50l. per annum. The other moiety, he left to the company of mercers, to find three more able persons, chosen by a committee of that company, consisting of the master and three wardens, during their office, and eight of the court of assistants, to read law, physic, and rhetoric, on the same terms; with this limitation, that the several lecturers should read in term-time, every day in the week except Sundays; in the morning in Latin, in the afternoon the same in English; but that in music to be read only in English. By 8th Geo. III. cap. 32. the building appropriated to this college was taken down, and the excise-office erected in its room. Each of the professors is allowed 50l. per annum, in lieu of the apartments, &c. relinquished by them in the college, and is permitted to marry, notwithstanding the restriction of Sir Thomas Gresham's will. The lectures are now read in a room over the Royal Exchange; and the city and mercer's company are required to provide a proper place for this purpose.

In this college formerly met the Royal Society, that noble academy, instituted by King Charles II. and celebrated throughout the world for their improvements in natural knowledge. See their history and policy under SOCIETY.

College de Propaganda Fide, was founded at Rome in 1622 by Gregory XV. and enriched with ample revenues. It consists of thirteen cardinals, two priests, and a secretary; and was designed for the propagation and maintenance of the Romish religion in all parts of the world. The funds of this college have been very considerably augmented by Urban VIII. and many private donations. Missionaries are supplied by this institution, together with a variety of books suited to their several appointments. Seminaries for their in-

struction are supported by it, and a number of charitable establishments connected with and conducive to the main object of its institution.

Another college of the same denomination was established by Urban VIII. in 1627, in consequence of the liberality of John Baptist Viles, a Spanish nobleman. This is set apart for the instruction of those who are designed for the foreign missions. It was at first committed to the care of three canons of the patriarchal churches; but ever since the year 1641 it is under the same government with the former institution.

College of Heralds, commonly called the *Heralds Office*; a corporation founded by charter of King Richard III. who granted them several privileges, as to be free from subsidies, tolls, offices, &c. They had a second charter from King Henry VI.; and a house built near Doctors Commons, by the earl of Derby, in the reign of King Henry VII. was given them by the duke of Norfolk, in the reign of Queen Mary, which house is now rebuilt.

This college is subordinate to the earl marshal of England. They are assistants to him in his court of chivalry, usually held in the common hall of the college, where they sit in their rich coats of his majesty's arms. See HERALD.

College of Heralds in Scotland, consists of Lyon king at arms, six heralds, and six pursuivants, and a number of messengers. See LYON.

COLLEGIANS, COLLEGIANI, COLLEGIANTS, a religious sect formed among the Arminians and Anabaptists in Holland, about the beginning of the seventeenth century; so called because of their colleges, or meetings, twice every week, where every one, females excepted, has the same liberty of expounding the Scripture, praying, &c. They are said to be all either Arians or Socinians; they never communicate in the college, but meet twice a-year from all parts of Holland at Rhinsbergh, whence they are so called *Rhinsberghers*, a village two miles from Leyden, where they communicate together; admitting every one that presents himself, professing his faith in the divinity of the Holy Scriptures, and resolution to live suitably to their precepts and doctrines, without regard to his sect or opinion. They have no particular ministers, but each officiates as he is disposed. They never baptize without dipping.

COLLEGIATE, or COLLEGIAL, churches, are those which have no bishop's see, yet have the ancient retinue of the bishop, the *canons and prebends*. Such are Westminster, Rippon, Windsor, &c. governed by deans and chapters.

Of these collegiate churches there are two kinds; some of royal, and others of ecclesiastical foundation; each of them, in matters of divine service, regulated in the same manner as the cathedrals. There are even some collegiate churches that have the episcopal rights. Some of these churches were anciently abbeys, which in time were secularized. The church of St Peter's, Westminster, was anciently a cathedral; but the revenues of the monastery being by act of parliament 1 Elizabeth vested in the dean and chapter, it commenced a collegiate church. In several causes the styling it *cathedral*, instead of *collegiate church* of Westminster, has occasioned error in the pleadings.

COLLET,

College
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Collegiate.

Collet
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Collins.

COLLET, among jewellers, denotes the horizontal face or plane at the bottom of brilliants. See BRILLIANT.

COLLET, in glass-making, is that part of glass vessels which sticks to the iron instrument wherewith the metal was taken out of the melting-pot: these are afterwards used for making green glass.

COLLETICS, in *Pharmacy*, denotes much the same with AGGLUTINANTS or VULNERARIES.

COLLIER, JEREMY, a learned English nonjuring divine, born in 1650, and educated in Caius college Cambridge. He had first the small rectory of Amp-ton, near St Edmund's Bury in Suffolk, which in six years he resigned, to come to London, in 1685, where he was made lecturer of Gray's Inn; but the change of government that followed, soon rendered the public exercise of his function impracticable. He was committed to Newgate for writing against the revolution; and again, for carrying on a correspondence which that change of events made treasonable; but was released both times, without trial, by the intervention of friends. It is observable that he carried his scruples so far, as to prefer confinement to the tacit acknowledgment of the jurisdiction of the court by accepting his liberty upon bail. Suitable to these principles, he next acted a very extraordinary part with two other clergymen of his own way of thinking, at the execution of Sir John Friend and Sir William Perkins for the assassination plot; by giving them solemn absolution, and by imposition of hands. Absconding for which, he continued under an outlawry to the day of his death in 1726. These proceedings having put a stop to his activity, he employed his retired hours rather more usefully in literary works. In 1698, he attempted to reform our theatrical entertainments, by publishing his "Short view of the immorality and profaneness of the English stage," which engaged him in a controversy with the wits of the time; but as Mr Collier defended his censures not only with wit, but with learning and reason, it is allowed that the decorum observed, for the most part, by succeeding dramatic writers, has been owing to his animadversions. He next undertook a translation of Moreri's great Historical and Geographical Dictionary; a work of extraordinary labour, and which appeared in 4 vols folio. After this he published "An Ecclesiastical History of Great Britain, chiefly of England," in 2 vols folio; which is allowed to be written with great judgment, and even with impartiality. He was besides engaged in several controversies, which his conduct and writings gave rise to, not material to mention. In Queen Anne's reign, Mr Collier was tempted, by offers of considerable preferment, to a submission; but as he was a nonjuror upon principle, he could not be brought to listen to any terms.

COLLIER, or COALLIER. See COALLIER.

COLLIERY, COALERY, or COALLIERY. See COALERY.

COLLINS, ANTHONY, a polemical writer, born at Heston near Hounslow in the county of Middlesex in 1676, was the son of Henry Collins, a gentleman of about 1500*l.* a-year. He was first bred at Eton college, and then went to King's-college Cambridge, where he had for his tutor Mr Francis Hare, afterwards bishop of Chichester. He was afterwards a

student of the Temple; but not relishing the law, soon abandoned that study. He was an ingenious man, and author of several curious books. His first remarkable piece was published in 1707, "An Essay concerning the use of reason in propositions, the evidence whereof depends on human testimony." In 1702, he entered into the controversy between Mr Clark and Dr Dodwell, concerning the immortality of the soul. In 1713, he published his discourse on free-thinking, which made a prodigious noise. In 1725, he retired into the county of Essex, and acted as a justice of peace and deputy lieutenant for the same county, as he had done before for that of Middlesex and liberty of Westminster. The same year, he published a "Philosophical Essay concerning human liberty." In 1718, he was chosen treasurer of the county of Essex; and this office he discharged with great honour. In 1724, he published his "Historical and critical Essay on the 39 Articles." Soon after, he published his "Discourse of the Grounds and reasons of the Christian religion;" to which is prefixed, "An Apology for free debate and liberty of writing;" which piece was immediately attacked by a great number of authors. In 1726 appeared his "Scheme of literary prophecy considered, in a view of the controversy occasioned by a late book entitled, A discourse of the grounds, &c." In this discourse he mentions a MS. dissertation of his, to show the Sibylline oracles to be a forgery made in the times of the primitive Christians, who, for that reason, were called *Sibyllists* by the Pagans; but it never appeared in print. His scheme of literary prophecy was replied to by several writers; and particularly by Dr John Rogers, in his "Necessity of divine revelation asserted." In answer to which our author wrote, "A letter to the Reverend Dr Rogers, on occasion &c." His health began to decline some years before his death, and he was very much afflicted with the stone, which at last put an end to his life at his house in Harley square in 1729. He was interred in Oxford chapel, where a monument was erected to him, with an epitaph in Latin. His curious library was open to all men of letters, to whom he readily communicated all the assistance in his power; he even furnished his antagonists with books to confute himself, and directed them how to give their arguments all the force of which they were capable. He was remarkably averse to all indecency and obscenity of discourse; and was independent of his scepticism, a sincerely good man.

COLLINS, *John*, an eminent accountant and mathematician, born in 1624, and bred a bookseller at Oxford. Besides several treatises on practical subjects, he communicated some curious papers to the Royal Society, of which he was a member, which are to be found in the early numbers of the Philosophical Transactions: and was the chief promoter of many other scientific publications in his time. He died in 1683; and about 25 years after, all his papers coming into the hands of the learned William Jones, Esq. F. R. S. it appeared that Mr Collins held a constant correspondence for many years with all the eminent mathematicians; and that many of the late discoveries in physical knowledge, if not actually made by him, were yet brought forth by his endeavours.

COLLINS, *William*, an admirable poet, was born at

Collins.

Collins.

at Chichester, about the year 1724. He received his classical education at Winchester, after which he studied at New college, in Oxford, was admitted a commoner of King's college in the same university, and was at length elected a demy of Magdalene college. While at Oxford, he applied himself to the study of poetry, and published his *Oriental Eclogues*, after which he came to London. He was naturally possessed of an ear for all the varieties of harmony and modulation; his heart was susceptible of the finest feelings of tenderness and humanity, and was particularly carried away by that high enthusiasm which gives to imagination its strongest colouring; and he was at once capable of soothing the ear with the melody of his numbers, of influencing the passions by the force of the pathos, and of gratifying the fancy by the luxury of description. With these powers, he attempted lyric poetry; and in 1746, published his *Odes*, descriptive and allegorical; but the sale of this work being not at all answerable to its merit, he burnt the remaining copies in indignation. Being a man of a liberal spirit and a small fortune, his pecuniary resources were unhappily soon exhausted; and his life became a miserable example of necessity, indolence, and dissipation. He projected books which he was well able to execute; and became in idea an historian, a critic, and a dramatic poet; but wanted the means and encouragement to carry these ideas into execution. Day succeeded day, for the support of which he had made no provision; and he was obliged to subsist, either by the repeated contributions of a friend or the generosity of a casual acquaintance. His spirits became oppressed, and he sunk into a fullen dependence. While in this gloomy state of mind, his uncle Colonel Martin died, and left him a considerable fortune. But this came too late for enjoyment; he had been so long harassed by anxiety and distress that he fell into a nervous disorder, which at length reduced the finest understanding to the most deplorable childishness. In the first stages of this disorder he endeavoured to relieve himself by travelling, and passed into France; but the growing malady obliged him to return; and having continued, with short intervals, in this pitiable state till the year 1756, he died in the arms of his sister.

The following character of the poetry of Collins is drawn by Mrs Barbauld, and is extracted from an essay prefixed to an edition of his works published in 1797. "He will be acknowledged to possess imagination, sweetness, bold and figurative language. His numbers dwell on the ear, and easily fix themselves in the memory. His vein of sentiment is by turns tender and lofty, always tinged with a degree of melancholy, but not possessing any claim to originality. His originality consists in his manner, in the highly figurative garb in which he clothes abstract ideas, in the felicity of his expressions, and his skill in embodying ideal creations. He had much of the mysticism of poetry, and sometimes became obscure, by aiming at impressions stronger than he had clear and well-defined ideas to support. Had his life been prolonged, and with life had he enjoyed that ease which is necessary for the undisturbed exercise of the faculties, he would probably have risen far above most of his contemporaries."

Collinson.

COLLINSON, PETER, an eminent naturalist and antiquarian, descended of an ancient family, was born on the paternal estate called *Hugal Hall*, or *Height of Hugal*, near Windermere lake, in the parish of Stavely, about 10 miles from Kendal in Westmorland. Whilst a youth, he discovered his attachment to natural history. He began early to make a collection of dried specimens of plants, and had access to the best gardens at that time in the neighbourhood of London. He became early acquainted with the most eminent naturalists of his time; the Drs Derham, Woodward, Hale, Lloyd, and Sloane, were amongst his friends. Among the great variety of articles which form that superb collection, now (by the wise disposition of Sir Hans and the munificence of parliament) the British Museum, small was the number of those with whose history Mr Collinson was not well acquainted; he being one of those few who visited Sir Hans at all times familiarly; their inclinations and pursuits in respect to natural history being the same, a firm friendship had early been established between them. Peter Collinson was elected a fellow of the Royal Society on the 12th of December 1728; and perhaps was one of the most diligent and useful members, not only in supplying them with many curious observations himself, but in promoting and preserving a most extensive correspondence with learned and ingenious foreigners, in all countries and on every useful subject. Besides his attention to natural history, he minuted every striking hint that occurred either in reading or conversation; and from this source he derived much information, as there were very few men of learning and ingenuity who were not of his acquaintance at home; and most foreigners of eminence in natural history, or in arts and sciences, were recommended to his notice and friendship. His diligence and economy of time were such, that though he never appeared to be in a hurry, he maintained an extensive correspondence with great punctuality; acquainting the learned and ingenious in distant parts of the globe with the discoveries and improvements in natural history in this country, and receiving the like information from the most eminent persons in almost every other. His correspondence with the ingenious Cadwallader Colden, Esq. of New-York, and the justly celebrated Dr Franklin of Philadelphia, furnish instances of the benefit resulting from his attention to all improvements. The latter of these gentlemen communicated his first essays on electricity to Mr Collinson, in a series of letters, which were then published, and have been reprinted in a late edition of the Doctor's ingenious discoveries and improvements. Perhaps, in some future period, the account procured of the management of sheep in Spain, published in the Gentleman's Magazine for May and June 1764, may not be considered among the least of the benefits accruing from his extensive and inquisitive correspondence. His conversation, cheerful and usefully entertaining, rendered his acquaintance much desired by those who had a relish for natural history, or were studious in cultivating rural improvements; and secured him the intimate friendship of some of the most eminent personages in this kingdom, as distinguished by their taste in planting and horticulture, as by their rank and dignity. He was the first who introduced the great variety of seeds and shrubs which are now the principal

Collinsonia
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Collybus.

principal ornaments of every garden; and it was owing to his indefatigable industry, that so many persons of the first distinction are now enabled to behold groves transplanted from the western continent flourishing as luxuriantly in their several domains as if they were already become indigenous to Britain. He had some correspondents in almost every nation in Europe, some in Asia, and even at Pekin; who all transmitted to him the most valuable seeds they could collect, in return for the treasures of America. The great Linnæus, during his residence in England, contracted an intimate friendship with Mr Collinson, which was reciprocally increased by a multitude of good offices, and continued to the last. Besides his attachment to natural history, he was very conversant in the antiquities of our own country, having been elected a member of the Society of Antiquaries April 7. 1737; and he supplied them often with many curious articles of intelligence and observation, respecting both our own and other countries. He died in 1768, leaving behind him many materials for the improvement of natural history.

COLLINSONIA. See BOTANY Index.

COLLIQUAMENTUM, in *Natural History*, an extreme transparent fluid in an egg, observable after two or three days incubation, containing the first rudiments of the chick. It is included in one of its own proper membranes, distinct from the albumen. Harvey calls it the *oculus*.

COLLIQUATION, in *Chemistry*, is applied to animal, vegetable, and mineral substances, tending towards fusion. See FUSION.

COLLIQUATION, in *Physic*, a term applied to the blood, when it loses its crasis or balsamic texture; and to the solid parts, when they waste away, by means of the animal fluids flowing off through the several glands, and particularly those of the skin, faster than they ought; which occasions fluxes of many kinds, but mostly profuse, greasy, and clammy sweats.

COLLIQUATIVE FEVER, in *Physic*, a fever attended with a diarrhoea, or with profuse sweats.

COLLISION, the striking of one hard body against another; or the friction or percussion of bodies moving violently with different directions, and dashing against each other, as flint and steel.

COLLUM, the same with NECK.

COLLUSION, in *Law*, a secret understanding between two parties, who plead or proceed fraudulently against each, to the prejudice of a third person.

COLLUTHIANS, a religious sect who rose about the beginning of the fourth century, on occasion of the indulgence shown to Arius by Alexander, patriarch of Alexandria. Several people being scandalized at so much condescension; and, among the rest, Colluthus, a priest of the same city, he hence took a pretence for holding separate assemblies, and by degrees proceeded to the ordination of priests as if he had been a bishop, pretending a necessity for this authority in order to oppose Arius. To his schism he added heresy, teaching, that God did not create the wicked; that he was not author of the evils that befall men, &c. He was condemned by a council held at Alexandria by Osius, in the year 330.

COLLYBUS (Κολλυβος), in antiquity, the same with what is now called *the rate of exchange*.

COLLYRÆ, or COLLYRIDES, in antiquity, a certain ornament of hair, worn by the women on their necks. It was made up in the form of the small roundish cakes called *κολλυραι*, *collyræ*.

COLLYRIDIAN, in church-history, a sect, towards the close of the 4th century, denominated from a little cake, called by the Greeks *κολλυριδιαι*, *collyridia*, which they offered to the Virgin Mary.

This sect, it seems, consisted chiefly of Arabian women, who, out of an extravagance of devotion to the Virgin, met on a certain day in the year, to celebrate a solemn feast, and to render divine honours to Mary as to a goddess, eating the cake which they offered in her name. St Epiphanius, who relates the history of this superstitious ceremony, ridicules it. They sprung up in opposition to the ANTIDICO-MARIANITES.

COLLYRIUM, in *Pharmacy*, a topical remedy for a disorder of the eyes, designed to cool and repel hot sharp humours.

COLMAN, GEORGE, a miscellaneous and theatrical writer, was born at Florence about the year 1733. He was the son of Mr Colman, at that time British resident at the court of the duke of Tuscany, and of a sister of the countess of Bath. He received the early part of his education at Westminster school, where Lloyd, Churchill, Bonnel Thornton, and some others who became afterwards distinguished literary characters, were among his intimate companions. While at school he appeared in the character of a poet, having addressed a copy of verses to his cousin Lord Pulteney, which were afterwards published in the magazine of St James. He was next sent to Christ Church College, Oxford, where he gave many proofs of his lively genius, uniting with Thornton in producing a weekly periodical paper, entitled the "Connoisseur," which was continued from January 1754, to September 1756, and afterwards published in 4 vols 12mo. Although this work met not with an equal share of approbation with the *World*, the *Adventurer*, and the *Rambler*, which made their appearance much about the same time, yet it may with justice be affirmed, that some papers of it are superior to any which these performances contain, for a ludicrous delineation of the current manners, which has always been considered as an essential department of every periodical work. When Mr Colman took the degree of A. M. he left the college, and resided in London. He entered at Lincoln's-Inn, and in proper time was admitted to the bar; but literary pursuits were much more consonant to the bent of his genius. He published in 1760 a dramatic piece of great humour, called *Polly Honeycombe*, which was successfully acted in Drury-lane, and the following year he gave the world his comedy of the *Jealous Wife*, deemed the best which had for many years appeared. By the demise of Lord Bath he came to the possession of a handsome fortune, and it was farther augmented by the death of General Pulteney, in 1767. He still continued to write for the stage, and produced, along with Garrick, that excellent comedy called the *Clandestine Marriage*. He also translated the comedies of Terence into a kind of blank verse, which gained him considerable applause.

He soon after this made a purchase of Haymarket theatre from Mr Samuel Foote, which he supplied with

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Colman.

Colmar
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Cologne.

pieces either original or translations, and selected the ablest actors, particularly in comedy. To a translation he made of Horace's Art of Poetry, he prefixed an ingenious account of the intention of its author; and added importance to the whole work by many critical notes. The Genius, and the Gentleman, were other two of his performances, as also a number of small pieces of the humorous kind. His understanding was much impaired by a stroke of the palsy, which seized him in the year 1789, in consequence of which melancholy event, his son was intrusted with the management of the theatre. He died in the month of August, 1794, in the 62d year of his age.

COLMAR, a considerable town of France, in Upper Alsace, of which it is the capital. It has great privileges, and the Protestants have liberty of conscience. It is seated near the river Ill, in E. Long. 7. 27. N. Lat. 48. 5.

COLMARS, a town of France in Provence, and the diocese of Sens. It is seated near the Alps, in E. Long. 6. 35. N. Lat. 44. 7.

COLMOGOROD, a town of the empire of Russia, with an archbishop's see, seated in an island formed by the river Dwina, in E. Long. 39. 42. N. Lat. 64. 14.

COLNBROOK, a town of Buckinghamshire in England, seated on the river Coln, which separates this county from Middlesex. It is a great thoroughfare on the western road, and has several good inns. W. Long. 0. 25. N. Lat. 51. 30.

COLNE, a town of Lancashire in England, seated on a small hill near the confines of the county. W. Long. 2. 5. N. Lat. 53. 50.

COLOCHINA, an ancient town of the Morea, in Turkey in Europe. E. Long. 23. 22. N. Lat. 36. 32.

COLOCYNTHIS, in *Botany*, a species of *Cucumis*.

COLOCZA, a town of Hungary, seated on the Danube, and capital of the county of Bath, with an archbishop's see. It was taken by the Turks in 1686, but afterwards retaken by the Imperialists. E. Long. 18. 29. N. Lat. 46. 38.

COLOGNA, a town of Italy, in Padua, and in the territory of Venice. E. Long. 17. 27. N. Lat. 45. 14.

COLOGNE, The ARCHBISHOPRIC or DIOCESE of, one of the states that compose the electoral circle of the Rhine, in Germany. It is bounded on the north by the duchy of Cleves and Gueldres, on the west by that of Juliers, on the south by the archbishopric of Cleves, and on the east by the duchy of Berg, from which it is almost wholly separated by the Rhine. This country is very fruitful in corn and wine, which the inhabitants dispose of by embarking it on the Rhine, it extending above seventy miles along that river. It is divided into the Higher and Lower Diocese: the Higher Diocese contains that part which lies above Cologne, wherein is Bonne, the capital town of this electorate, and where the elector resides; besides which there are Leichnich, Andernach, Bruyl, Zulich, and Kerpen. The Lower Diocese is on the other side of Cologne, and contains the towns of Zonz, Neuys, Heizarwart, Kempen, Rhynberg, and Alpen. The city of Cologne and county of Meurs, though within the diocese of Cologne, do not belong to it; for Cologne is a free city, and Meurs belongs to the

house of Nassau Orange; but by way of recompense, the elector has considerable dominions in Westphalia, which they call the *Domain*. It contains the duchy of Westphalia, and the county of Reclinchusen. This prelate is one of the electors of the empire, and holds alternately with that of Treves the second or third rank in the electoral college. He is arch-chancellor of the empire in Italy, which dignity was very important when the emperors were masters of Italy, but now it is next to nothing. When the emperors were crowned at Aix-la-Chapelle, the archbishop of Cologne performed the ceremony, which caused him to pretend to the same right elsewhere; but he was opposed by the archbishop of Mentz. This occasioned an order, that they should each of them have that honour in his own diocese, but if it was done elsewhere, they should perform it alternately. The archbishop of Cologne is elected by the chapter in that city, which is the most illustrious in all Germany. They are all princes or counts, except eight doctors, who have no occasion to prove their nobility.

COLOGNE, an ancient and celebrated town of Germany, in the diocese of that name, with an archbishop's see, and a famous university, seated on the river Rhine, in E. Long. 7. 10. N. Lat. 50. 55. In the times of the Romans, this city was called *Colonia Agrippina*, and *Ubiorum*, because it was built by Agrippina, the wife of Claudius I. and mother of Nero; and because the Ubii inhabited this country on the Lower Rhine. In 755, it was an archbishopric, and in 1260 entered into the Hanseatic league, which has now no existence. The university was established in 1388 by Pope Urban VI. The city is fortified with strong walls, flanked with 83 large towers, and surrounded with three ditches; but these fortifications, being executed after the ancient manner, could make but a poor defence at present. It lies in the shape of a half-moon, and is said to have 20 gates, 19 parishes, 17 monasteries, and 365 churches and chapels; but the streets, in general, are dirty and badly paved, the windows of the houses composed of small bits of round glass, and the inhabitants are but few for so large a place. It is inhabited mostly by Papists; but there are also many Protestants, who repair to the neighbouring town of Mulheim, in the duchy of Berg, for public worship. Its trade, which is considerable, especially in Rhenish wine, is chiefly in the hands of Protestants, and carried on by the Rhine. The ships with which they trade to the Netherlands are of a particular construction, and considerable burden. The clergy here are very numerous, and have large revenues. That of the archbishop is 130,000*l*. Baron Polnitz says, that though Cologne is one of the greatest cities, it is one of the most melancholy in all Europe; there being nothing to be seen but priests, friars, and students, many of whom beg alms with a song; and nothing to be heard but the ringing of bells; that there are very few families of quality; that the vulgar are very clownish; and that the noblemen of the chapter stay no longer in town than their duty obliges them. Mr Wright, in his travels, says, that the women go veiled; and that the best gin is that distilled from the juniper berries which grow in this neighbourhood. This city is perhaps the most remarkable of any in the world for the great number of precious relics it contains, of which the Popish clergy,

Cologne. no doubt make their advantage. In the church of St Ursula, they pretend to show her tomb, and the bones of the 11,000 pretended virgin martyrs, though that story is entirely owing to a mistaken inscription. The heads of some of these imaginary martyrs are kept in cases of silver, others are covered with stuffs of gold, and some have caps of cloth of gold and velvet. Brevat says, he saw between 4000 and 5000 skulls, decked with garlands, and coronets, ranged on shelves. The canonesse of St Ursula, who must be all countesses, have a handsome income. In their church they pretend to show three of the thorns of our Saviour's crown, and one of the vessels which contained the water that he converted into wine at the marriage of Cana. In the church of St Gereon are 900 heads of Moorish cavaliers, said to have been in the army of Constantine before it was converted, and to have been beheaded for refusing to sacrifice to idols. Every one of the heads has a cap of scarlet, adorned with pearls. In the magnificent cathedral of St Peter, the three wise men who came from the east to visit our Saviour, are said to be interred. They lie in a large purple shrine spangled with gold, set upon a pedestal of brass, in the midst of a square mausoleum, faced within and without with marble and jasper. It is opened every morning at nine o'clock, if two of the canons of the cathedral are present, when these kings or wise men are seen lying at full length, with their heads bedecked with a crown of gold garnished with precious stones. Their names, which are *Gasper, Melchior, and Balthasar*, are in purple characters on a little grate, which is adorned with an infinite number of large rich pearls and precious stones, particularly an oriental topaz as big as a pigeon's egg, and valued at above 30,000 crowns. Over against them are six large branches of silver, with wax candles, which burn night and day. The bones of these men, we are told, were brought to Constantinople by Helena mother to Constantine, from thence to Milan by Eutropius bishop of that see, and afterwards hither by Archbishop Rainold. In the Jesuits college are the portraits of the first 13 generals of that order, with Ignatius Loyola at their head; and in the church, which is the finest in Cologne, are many rich statues, with an amazing quantity of fine silver plate; and the utensils for mass are all of gold enriched with precious stones. In the Cordeliers church, is the tomb of the famous Duns Scotus, surnamed *Doctor Subtilis*, with this epitaph, "Scotia me genuit, Anglia me suscepit, Gallia me docuit, Colognia me tenet." Cologne is a free imperial city, and as such has a seat and voice at the diets of the empire, and circle of the Lower Rhine. In those of the empire, it has the first place on the Rhenish bench. Towards the defence of the empire, its assessment is 825 florins; and towards the maintenance of the chamber-court, 405 rix-dollars 72½ kruitzers, each term. Its militia consists of four companies of foot, who keep guard at the gates. It is governed by its own senate, in respect to civil matters and causes; but the criminal jurisdiction belongs to the elector and his chapter; and so jealous are the inhabitants of him, that they will not permit him to stay in the city above three days at a time, nor to come into it with a large retinue. For this reason the elec-

tor resides commonly at Bonn. Cologne surrendered to the French in 1794.

COLOGNE-EARTH, a kind of very light bastard ochre, of a deep brown colour.

COLOMBO, a handsome, pleasant, and strong town of Asia, seated on the eastern side of the island of Ceylon in the East Indies. It was built by the Portuguese in 1638; and in 1658 they were driven from it by the natives, assisted by the Dutch, who are now in possession of it. It is about three quarters of a mile long, and as much in breadth. The natives live in the old town, without the walls of the new; the streets of this last are wide and spacious; and the buildings are in the modern taste, particularly the governor's house which is a handsome structure. E. Long. 80. 25. N. Lat. 7. 10.

COLOMEY, or COLOMIA, a town of Poland in Red Russia, seated on the river Pruth, in E. Long. 25. 9. N. Lat. 48. 45.

COLOMNA, FABIO, a very learned botanist, born at Naples about the year 1567. He became skilled in the languages, in music, designing, painting, and the mathematics; and died about the middle of the 17th century. He wrote, 1. *Πυροβασις*, seu Plantarum aliquot (ac piscium) historia. 2. *Minus cognitarum rariorumque stirpium exheredis*; itemque de aquatilibus, aliisque nonnullis animalibus, libellus; and other works.

COLON, in *Anatomy*, the first and most considerable of the large intestines. See ANATOMY, N^o 194.

COLON, in *Grammar*, a point, or character formed thus [:], serving to mark a pause, and to divide the members of a period. See POINTING; see also PERIOD, COMMA, and SEMICOLON. Grammarians generally assign the use of a colon to be, to mark the middle of a period; or to conclude a sense less perfect than the dot or period:—but, a sense less perfect than the period, is an expression extremely vague and indeterminate. See PERIOD.

Others say, a colon is to be used when the sense is perfect, but the sentence not concluded; but neither is this over clear and express.

A late author, in an ingenious discourse, *De ratione interpungendi*, marks the office of the colon, and wherein it differs from the semicolon, &c. more precisely. A colon, on his principles, serves to distinguish those conjunct members of a sentence, which are capable of being divided into other members; whereof one, at least, is conjunct. Thus, in the sentence, *As we cannot discern the shadow moving along the dial-plate, so the advances we make in knowledge are only perceived by the distance gone over*; the two members being both simple, are only separated by a comma. In this, *As we perceive the shadow to have moved, but did not perceive it moving; so our advances in understanding, in that they consist of such minute steps, are only perceivable by the distance*;—the sentence being divided into two equal parts, and those conjunct ones, since they include others; we separate the former by a semicolon, and the latter by commas. But in this, *As we perceive the shadow to have moved along the dial, but did not perceive it moving; and it appears the grass has grown, though nobody ever saw it grow: so the advances we make in knowledge, as they consist of such minute steps,*

are

Colonel
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Colonia
Trajana.

are only perceivable by the distance—the advancement in knowledge is compared to the motion of a shadow, and the growth of grass; which comparison divides the sentence into two principal parts: but since what is said of the movement of the shadow, and likewise of the growth of grass, contains two simple members, they are to be separated by a semicolon; consequently a higher pointing is required to separate them from the other part of the sentence, which they are opposed to: and this is a colon. See PUNCTUATION.

COLONEL, in military matters, the commander in chief of a regiment, whether horse, foot, or dragoons.

Skinner derives the word from colony, being of opinion, the chiefs of colonies, called *coloniales*, might give the name to chiefs of forces. In the French and Spanish armies, colonel is confined to the infantry and dragoons: the commanding officer of a regiment of horse they usually call *mestre de camp*. Formerly, instead of colonel, the French used the word coronel; and this old spelling comes nearer to our common way of pronouncing the word *colonel*.

A colonel may lay any officer of his regiment in arrest, but must acquaint the general with it; he is not allowed a guard, only a sentry from the quarter-guard.

COLONEL-Lieutenant, he who commands a regiment of guards, whereof the king, prince, or other person of the first eminence, is colonel. These colonel-lieutenants have always a colonel's commission, and are usually general officers.

Lieutenant-COLONEL, the second officer in a regiment, who is at the head of the captains, and commands in the absence of the colonel.

COLONIA, in *Ancient Geography*, a town of the Trinobantes, a little above Camelodunum. Now Colchester in Essex, according to Camden, who supposes it to take its name from the river Colne, and not that it was a colony; though others think Antonine's distances agree with Sudbury.

COLONIA *Equestris*, an ancient and noble colony on the Lacus Lemanus. It appears to be the work of Julius Cæsar, who settled there *Equites Limatenci*; and to this Lucan is thought to refer. By the Itinerary it is supposed to have stood between Laufanne and Geneva, 12 miles from the last place by Peutinger's map, which directs to Nyon, placed in Cavo Lemano, according to Lucan's expression, that is, a bay or cove of the lake. Its ancient name was *Noviodunum*, (*Notitia Galliarum*): hence its modern name.

COLONIA *Metallina*, or *Metallinensis*, a town of Lusitania, situated on the right or west side of the Anas, or Guadiana; but now on the left or east side, from the river's shifting its bed or channel, and called Medelin, a town in Estremadura. W. Long. 6. 12. Lat. 38. 45.

COLONIA *Morinorum*, a town of Belgica, thought to be Tarvenna, the capital of the Morini. Now Terrouen, a town of Artois. E. Long. 2. 15. Lat. 50. 37.

COLONIA *Norbensis*, or *Norba Casarea*, a town of Lusitania, to the south of Trajan's bridge on the Tagus. Now *Alcantara*, in Estremadura. W. Long. 7. 10. N. Lat. 39. 10.

COLONIA *Trajana*, (Antonine, Peutinger); a town

of Belgica, surnamed also *Ulpia*, (Antonine); and *Tricesima*, from being the station of the thirtieth legion, (Ammian). Now Kellen, a village of the duchy of Cleves, a mile from the Rhine.

COLONIA *Valentia*, (Ptolemy, Livy); a town of the Hither Spain, on the Turias; destroyed by Pompey, (Sallust); restored by Julius Cæsar. Still called Valencia, on the river Guadalaviar, in Valencia. W. Long. 35. Lat. 39. 20.

COLONNA, a town of Italy, in the Campagna of Rome, 18 miles eastward of that city. E. Long. 12. 56. N. Lat. 41. 55.

COLONNA, *Pompey*, cardinal archbishop of Montreal in Sicily, and bishop of a very great number of places, made a conspicuous figure in the world. He was equally qualified to wear the cardinal's hat and the helmet, and experienced more than once the reverses of fortune. Julius II. removed him from all his dignities; but Leo I. restored him, created him cardinal, and sent him on several embassies. Clement VII. divested him of the purple, and again restored him to it. It was pretended he was obliged to him for his exaltation to the papal throne. The pope refusing him some request, he reproached him, saying, "That it was by his interest he had arrived at his dignity." The pope replied, "It is true, but let me be pope, and do not endeavour to be so yourself; for by acting as you do, you endeavour to dispossess me of that you have raised me to." He died viceroy of Naples in 1532. He wrote some poems in praise of Isabella Filamarini, in which he protests the chastity of his wishes. He wrote another work, *De laudibus mulierum*.

COLONNADE, in *Architecture*, a peristyle of a circular figure; or a series of columns disposed in a circle, and insulated within side.

A *Polystyle COLONNADE*, is that whose numbers of columns are too great to be taken in by the eye at a single view. Such is the colonnade of the palace of St Peter's at Rome, consisting of 284 columns of the Doric order, each above four feet and a half diameter, all in Tiburtine marble.

COLONOS, in *Ancient Geography*, an eminence near Athens, whither Oedipus, after his banishment from Thebes, is said to have retired; and hence it is that Sophocles calls the tragedy on the subject *Oedipus Coloneus*. A place sacred to Neptune, and where stood an equestrian statue of him. Here also stood Timon's tower; who, for his love of solitude, and hatred to mankind, was called *Misanthropos*, (*Paufanias*).

COLONSAY, one of the Hebrides or Western Islands belonging to Scotland. It comprehends that of Oronsay, from which it is only separated in time of flood, and both belong to the same proprietor, viz. Mr M'Neil. See ORONSAY.

COLONUS, a husbandman, or villager, who was bound to pay yearly a certain tribute, or at certain times of the year to plough some part of the lord's land; and from hence comes the word *clown*, who is called by the Dutch, *boor*.

COLONY, a company of people transplanted into a remote province in order to cultivate and inhabit it.

We may distinguish three kinds of colonies. First, those

Colonia
Valentia
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Colony.

Colony. those serving to ease or discharge the inhabitants of a country, where the people are become too numerous, so that they cannot any longer conveniently subsist.

The second are those established by victorious princes, and people in the middle of vanquished nations, to keep them in awe and obedience.

The third may be called *colonies of commerce*; because, in effect, it is trade that is the sole occasion and object thereof.

It was by means of the first kind of colonies that, some ages after the deluge, the east first, and successively all the other parts of the earth, became inhabited; and without mentioning any thing of the Phœnician and Grecian colonies, so famous in ancient history, it is notorious that it was for the establishment of such colonies, that, during the declension of the empire, those torrents of barbarous nations, issuing, for the generality, out of the north, overran the Gauls, Italy, and the other southern parts of Europe; and, after several bloody battles, divided it with the ancient inhabitants.

For the second kind of colonies, the Romans used them more than any other people; and that to secure the conquests they had made from the west to the east. It is well known how many cities in Gaul, Germany, Spain, and even England, value themselves on their having been of the number of Roman colonies.

There were two kinds of colonies among the Romans: those sent by the senate; and the military ones, consisting of old soldiers, broken and disabled with the fatigues of war, who were thus provided with lands as the reward of their services. See *BENEFICE*. The colonies sent by the senate were either Roman or Latin, i. e. composed either of Roman citizens or Latins. The *Coloniæ Latinæ* were such as enjoyed the *jus Latini*; said to consist in those two things: one, that whoever was edile or prætor in a town of Latium, became for that reason a Roman citizen; the other, that the Latins were subject to the edicts of their own and not to those of the Roman magistrates: in the year of the city six hundred and sixty two, after the Social war, the city was granted to all Latium, by the *lex Julia*. The *coloniæ Romanæ*, were such as had the *jus Romanum*, but not in its full extent; namely, in the right of suffrage, putting up for honours, magistracies, command in the army, &c.; but the *jus Quiritium* only, or private right; as right of liberty, of gentility, or dignity of family, sacrifice, marriage, &c. For it was long a rule, never to grant the liberty of the city in full to colonies; nor is there any instance to the contrary, till after the Social war, in the year of the city six hundred and sixty-two. According to Ulpian (*l. i. D. de Cens.*), there were other colonies, which had little more than the name, only enjoying what they called *jus Italicum*, i. e. they were free from the tributes and taxes paid by the provinces. Such were the colonies of Tyre, Berytus, Heliopolis, Palmyra, &c. M. Vaillant has filled a volume in folio with medals struck by the several colonies, in honour of the emperors who founded them. The ordinary symbol they engraved on their medals, was either an eagle; as when the veteran legions were distributed in the colonies; or a labourer, holding a plough drawn

by a pair of oxen; as when the colony consisted of ordinary inhabitants. On all the medals are seen the names of the *décemviri*, who held the same rank and had the same authority there as the consuls had at Rome.

Lastly, the colonies of commerce, are those established by the English, French, Spaniards, Portuguese, and other nations, within these two last centuries, and which they continue still to establish, in several parts of Asia, Africa, and America; either to keep up a regular commerce with the natives, or to cultivate the ground, by planting sugar-canes, indigo, tobacco, and other commodities. The principal of this kind of colonies, are in the one and the other America, northern and southern; particularly Peru, Mexico, Canada (lately Virginia, New-England, Carolina), la Louisiana, l'Acadia, Hudson's Bay, the Antilles islands, Jamaica, Domingo, and the other islands.—In Africa, Madagascar, Cape of Good Hope, Cape Verd, and its islands, and all those vast coasts extending thence as far as to the Red sea. Lastly, in Asia, the famous Batavia of the Dutch; Goa, Diu, of the Portuguese; and some other less considerable places of the English, French, and Danes.

The practice of settling commercial colonies in distant countries hath been adopted by the wisest nations of antiquity, who acted systematically upon maxims of sound policy. This appears to have been the case with the ancient Egyptians, the Chinese, the Phœnicians, the commercial states of Greece, the Carthaginians, and even the Romans; for though the colonies of the latter were chiefly military, it could easily be shown that they were likewise made use of for the purposes of trade. The savage nations who ruined the Roman empire, fought nothing but to extirpate or hold in vassalage those whom they overcame; and therefore, whenever princes enlarged their dominions at the expence of their neighbours, they had recourse to strong forts and garrisons to keep the conquered in awe. For this they have been blamed by the famous Machiavel, who labours to show, that the settling of colonies would have been a cheaper and better method of bridling conquered countries, than building fortresses in them. John de Witt, who was one of the ablest and best statesmen that ever appeared, strongly recommended colonies; as affording a refuge to such as had been unfortunate in trade; as opening a field for such men to exert their abilities, as through want of interest could not raise themselves in their own country; and as a supplement to hospitals and other charitable foundations, which he thought in time might come to be overcharged. Some, however, have ridiculed the supposed advantages of colonies, and asserted that they must always do mischief by depopulating the mother-country.

The history of the British colonies, undoubtedly shows, that when colonists become numerous and opulent, it is very difficult to retain them in proper subjection to the parent state. It becomes then a question not very easily answered, how far they are entitled to the rights they had as inhabitants of the mother-country, or how far they are bound by its laws? On this subject Mr Blackstone hath the following observations.

“Plantations, or colonies in distant countries, are either

Colony.

either such where the lands are claimed by right of occupancy only, by finding them desert and uncultivated, and peopling them from the mother-country; or where, when already cultivated, they have either been gained by conquest, or ceded to us by treaties. And both the rights are founded upon the law of nature, or at least on that of nations. But there is a difference between these two species of colonies with respect to the laws by which they are bound. For it hath been held, that if an uninhabited country be discovered and planted by English subjects, all the English laws then in being, which are the birthright of every subject, are immediately there in force. But this must be understood with many and very great restrictions. Such colonists carry with them only so much of the English law as is applicable to their own situation, and the condition of an infant colony; such, for instance, as the general rules of inheritance, and of protection from personal injuries. The artificial refinements and distinctions incident to the property of a great and commercial people, the laws of policy and revenue (such especially as are enforced by penalties), the mode of maintenance for the established clergy, the jurisdiction of spiritual courts, and a multitude of other provisions, are neither necessary nor convenient for them, and therefore are not in force. What shall be admitted, and what rejected, at what times, and under what restrictions, must, in cases of dispute, be decided in the first instance by their own provincial judicature, subject to the revision and controul of the king in council; the whole of their constitution being also liable to be new-modelled and reformed by the general superintending power of the legislature in the mother-country. But in conquered or ceded countries, that have already laws of their own, the king may indeed alter and change those laws; but, till he does actually change them, the ancient laws of the country remain, unless such as are against the law of God, as in an infidel country. Our American plantations are principally of this latter sort, being obtained in the last century, either by right of conquest and driving out the natives (with what natural justice I shall not at present inquire), or by treaties. And therefore, the common law of England, as such, has no allowance or authority there; they being no part of the mother-country, but distinct (though dependent) dominions. They are subject, however, to the controul of the parliament; though (like Ireland, Mann, and the rest) not bound by any acts of parliament, unless particularly named."

With respect to their interior polity, our colonies, whether those we formerly possessed or still possess, may be distinguished into three sorts. 1. Provincial establishments, the constitutions of which depend on the respective commissions issued by the crown to the governors, and the instructions which usually accompany those commissions; under the authority of which provincial assemblies are constituted, with the power of making local ordinances not repugnant to the laws of Britain. 2. Proprietary governments, granted out by the crown to individuals, in the nature of feudatory principalities, with all their inferior regalities, and subordinate powers of legislation, which formerly belonged to the owners of counties palatine; yet still with these express conditions, that the ends

for which the grant was made be substantially pursued, and that nothing be attempted which may derogate from the sovereignty of the mother-country. 3. Charter governments, in the nature of civil corporations; with the power of making bye-laws for their own interior regulation, not contrary to the laws of Britain; and with such rights and authorities as are specially given them in their several charters of incorporation. The form of government, in most of them, is borrowed from that of England. They have a governor named by the king (or, in some proprietary colonies, by the proprietor), who is representative or deputy. They have courts of justice of their own, from whose decisions an appeal lies to the king in council here in England. Their general assemblies, which are their house of commons, together with their council of state, being their upper house, with the concurrence of the king, or his representative the governor, make laws suited to their own emergencies. But it is particularly declared, by stat. 7 and 8 W. III. c. 22. that all laws, bye-laws, usages, and customs, which shall be in practice in any of the plantations, repugnant to any law made or to be made in this kingdom relative to the said plantations, shall be utterly void and of none effect. And, because several of the colonies had claimed the sole and exclusive right of imposing taxes upon themselves, the statute 6 Geo. III. c. 12. expressly declares, that all his majesty's colonies in America, have been, are, and of right ought to be, subordinate to and dependent upon the imperial crown and parliament of Great Britain, who have full power and authority to make laws and statutes of sufficient validity to bind the colonies and people of America, subjects to the crown of Great Britain in all cases whatsoever. And the attempting to enforce this by other acts of parliament, penalties, and at last by military power, gave rise, as is well known, to the late revolt and final separation of thirteen colonies. See the article AMERICA. This country is now detached from Britain, and consists of 13 independent states, sometimes denominated the UNITED PROVINCES.

COLOPHON, in *Ancient Geography*, a town of Ionia, in the Hither Asia, on a promontory on the Egean sea, and washed by the Halesus. The ancient Colophon was destroyed by Lyfimachus, in his war with Antigonus, in order to enlarge Ephesus. Pausanias says, it was rebuilt in the neighbourhood, in a more commodious site. This was one of the cities that laid claim to Homer. *Colophonem addere*, a proverbial saying, explained by Strabo to denote, that the Colophonian horse turned the scales in favour of the side on which they fought. The Colophonians had a grove, a temple, and an oracle of Apollo Clarius (Strabo). Of this town was the poet Antimachus, remarked on for his turgid style by Catullus. He wrote a life of Homer, whom he makes a Colophonian (Plutarch).

COLOPHONY, in *Pharmacy*, black resin, or turpentine, boiled in water, and afterwards dried; or, which is still better, the caput mortuum remaining after the distillation of the ethereal oil, being further urged by a more intense and long continued fire.—It receives its name of *colophonia*, from Colophon, a city of Ionia, because the best was formerly brought from thence. Two sorts are mentioned in ancient writings; the,

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Colophony.

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tida
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Colours.

the one dry, the other in a liquid state. The latter seems to have been liquid pitch, which is the crude resin of the pine brought from Colophon; the other was called *resina fricta*, and consisted only of the former deprived of its humid parts.

COLOQUINTIDA, in *Botany*. See CUCUMIS.

COLORATURA, in *Music*, denotes all manner of variations, trillos, diminutions, &c. serving to make a song agreeable.

COLORNO, a town of Italy, in the Parmasau, near the river Po, eight miles from Parma. The duke of Parma has a pleasure-house here, one of the most delightful seats in all Italy, and the gardens are very fine. E. Long. 9. 15. N. Lat. 44. 54.

COLOSSÆ, or COLOSEÆ, in *Ancient Geography*, a considerable town of Phrygia Magna, in which the Lycus falls into a gulf, and at the distance of five stadia emerges again, and runs into the Meander (Herodotus). Others say, the genuine name is *Colosse*, and the people *Colossenses*, to whom St Paul wrote an epistle: Strabo calls them *Colosseni*. In Nero's time the town was destroyed by an earthquake (Orosius).

COLOSSUS, a statue of enormous or gigantic size. The most eminent of this kind was the colossus of Rhodes, a statue of Apollo, so high, that ships passed with full sails betwixt its legs. It was the workmanship of Chares, a disciple of Lyfippus, who spent 12 years in making it: it was at length overthrown by an earthquake, after having stood 1360 years. Its height was six score and six feet: there were few people who could fathom its thumb, &c. When the Saracens became possessed of the island, the statue was found prostrate on the ground: they sold it to a Jew, who loaded 900 camels with the brass.

The basis that supported it was a triangular figure; its extremities were sustained with 60 pillars of marble. There was a winding staircase to go up to the top of it, from whence one might discover Syria, and the ships that went into Egypt, in a great looking-glass, that was hung about the neck of the statue. Among the antiquities of Rome, there are seven famous colossuses; two of Jupiter, as many of Apollo, one of Nero, one of Domitian, and one of the Sun.

COLOSTRUM, the first milk of any animal after bringing forth young, called in some places *beeflings*. It is remarkable that this milk is generally cathartic, and purges the meconium; thus serving both as an aliment and medicine.

An emulsion prepared with turpentine dissolved with the yolk of an egg, is sometimes called by this name.

COLOSWAR, a large and celebrated town of Transylvania, where the senates have their meetings. It is seated on the river Samos, in E. Long. 21. 35. N. Lat. 46. 53.

COLOUR, in *Physics*, a property inherent in light, by which, according to the various sizes of its parts, or from some other cause, it excites different vibrations in the optic nerve; which propagated to the sensorium, affect the mind with different sensations. See CHROMATICS and OPTICS.

COLOUR, in *Painting*, is applied both to the drugs, and to the tints produced by those drugs variously mixed and applied.

The principal colours used by painters are red and

white lead, or ceruse; yellow and red ochres; several kinds of earth, umbre, orpiment, lamp-black, burnt ivory, black lead, cinnabar or vermilion, gamboge, lacca, blue and green ashes, verdigris, bistre, bice, smalt, carmine, ultramarine: each of which, with their uses, &c. are to be found under their proper articles.

Of these colours some are used tempered with gum-water, some ground with oil, others only in fresco, and others for miniature.

Painters reduce all the colours they use under these two classes, of dark and light colours: dark colours are black, and all others that are obscure and earthy, as umbre, bistre, &c.

Under light colours are comprehended white, and all that approach nearest to it.

Painters also distinguish colours into simple and mineral.

Under simple colours they rank all those which are extracted from vegetables, and which will not bear the fire; as the yellow made of saffron, French berries, lacca, and other tinctures extracted from flowers, used by limners, illuminers, &c.

The mineral colours are those which being drawn from metals, &c. are able to bear the fire, and therefore used by enamellers. Changeable and permanent colours is another division, which, by some, is made of colours.

Changeable colours are such as depend on the situation of the objects with respect to the eye, as that of a pigeon's neck, taffeties, &c. the first, however, being attentively viewed by the microscope, each fibre of the feathers appears composed of several little squares, alternately red and green, so that they are fixed colours.

Water-Colours, are such as are used in painting with gum-water or size, without being mixed with oil.

Incapacity of distinguishing Colours. Of this extraordinary defect in vision, we have the following instances in the Philosophical Transactions for 1777. One of the persons lived at Maryport in Cumberland. The account was communicated by Mr Huddart to Dr Priestley, and is as follows. "His name was Harris, by trade a shoemaker. I had often heard from others, that he could discern the form and magnitude of all objects very distinctly, but could not distinguish colours. This report having excited my curiosity, I conversed with him frequently on this subject. The account he gave was this: That he had reason to believe other persons saw something in objects which he could not see; that their language seemed to mark qualities with precision and confidence, which he could only guess at with hesitation, and frequently with error. His first suspicion of this arose when he was about four years old. Having by accident found in the street a child's stocking, he carried it to a neighbouring house to inquire for the owner; he observed the people called it a *red* stocking, though he did not understand why they gave it that denomination, as he himself thought it completely described by being called a *stocking*. This circumstance, however, remained in his memory, and, together with subsequent observations, led him to the knowledge of his defect.

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“ He also observed, that when young, other children could discern cherries on a tree, by some pretended difference of colour, though he could only distinguish them from the leaves by the difference of their size and shape. He observed also, that by means of this difference of colour they could see the cherries at a greater distance than he could, though he could see other objects at as a great a distance as they, that is, where the sight was not assisted by the colour. Large objects he could see as well as other persons; and even the smaller ones if they were not enveloped in other things, as in the case of cherries among the leaves.

“ I believe he could never do more than guess the name of any colour; yet he could distinguish white from black, or black from any light or bright colour. Dove or straw colour he called *white*, and different colours he frequently called by the same name; yet he could discern a difference between them when placed together. In general, colours of an equal degree of brightness, however they might otherwise differ, he confounded together. Yet a striped ribbon he could distinguish from a plain one; but he could not tell what the colours were with any tolerable exactness. Dark colours, in general, he often mistook for black; but never imagined white to be a dark colour, nor dark to be a white colour.

“ He was an intelligent man, and very desirous of understanding the nature of light and colours; for which end he had attended a course of lectures in natural philosophy.

“ He had two brothers in the same circumstances as to sight; and two other brothers and sisters, who, as well as their parents, had nothing of this defect.

“ One of the first mentioned brothers, who is now living, I met with at Dublin, and wished to try his capacity to distinguish the colours in a prism; but not having one by me, I asked him, whether he had ever seen a rainbow? he replied, He had often, and could distinguish the different colours; meaning only, that it was composed of different colours, for he could not tell what they were.

“ I then procured, and showed him a piece of ribbon; he immediately, and without any difficulty, pronounced it a striped, and not a plain, ribbon. He then attempted to name the different stripes: the several stripes of white he uniformly and without hesitation called white; the four black stripes he was deceived in; for three of them he thought brown, though they were exactly of the same shade with the other, which he properly called black. He spoke, however, with diffidence, as to all those stripes; and it must be owned, that the black was not very distinct; the light green he called yellow; but he was not very positive; he said, “ I think this is what you call yellow.” The middle stripe, which had a slight tinge of red, he called a sort of blue. But he was most of all deceived by the orange colour, of which he spoke very confidently, saying, “ This is the colour of grass, this is green.” I also showed him a great variety of ribbons, the colour of which he sometimes named rightly, and sometimes as differently as possible from the true colour.

“ I asked him, whether he imagined it possible for all the various colours he saw to be mere difference of

light and shade; and that all colours could be composed of these two mixtures only? With some hesitation he replied, No, he did imagine there was some other difference.

“ It is proper to add, that the experiment of the striped ribbon was made in the day-time, and in a good light.”

COLOURS for staining different kinds of Stones. See CHEMISTRY.

COLOUR, in Dyeing. See DYEING.

COLOUR of Plants, is an attribute found to be very variable. Different colours are observed, not only in different individuals of the same species, but likewise in different parts of the same individual. Thus, marvel of Peru, and sweet-william, have frequently petals of different colours on the same plant. Three or four different colours are frequently found upon the same leaf or flower, as on the leaves of the amaranthus tricolor, and the flowers of the tulip, auricula, three-coloured violet and others. To produce the most beautiful and striking variety of colours in such flowers, is the principal delight and business of the florist.

The primitive colours, and their intermediate shades or gradations enumerated by botanists, are as follow:

Water-colours, *hyalinus*.

WHITE.

Lead-colour, *cinereus*.

BLACK, *niger*.

Brown, *fuscus*.

Pitch-black, *ater*.

YELLOW, *luteus*.

Straw-colour, *flavus*.

Flame-colour, *fulvus*.

Iron-colour, *gilvus*.

RED.

Flesh-colour, *incarnatus*,

Scarlet, *coccineus*.

PURPLE.

Violet-colour, *cæruleo-purpureus*.

BLUE, *cæruleus*.

GREEN.

These colours seem to be appropriated to particular parts of the plant. Thus, white is most common in roots, sweet berries, and the petals of spring flowers. Water-colour, in the filaments and styles. Black, in the roots and seeds; rarely in the seed-vessel, and scarce ever to be found in the petals. Yellow is frequently in the antheræ or tops of the stamina; as likewise in the petals of autumnal flowers, and the compound legulated flowers of Linnæus. Red is common in the petals of summer flowers, and in the acid fruits. Blue and violet-colour, in the petals. Green, in the leaves and calyx, but rarely in the petals. In the interchanging of colours, which in plants is found to depend upon differences in heat, climate, soil, and culture, a sort of elective attraction is observed to take place. Thus, red is more easily changed into white and blue; blue into white and yellow; yellow into white; and white into purple. A red colour is often changed into a white, in the flowers of heath, mother of thyme, betony, pink, viscous campion, *cucubalus*, trefoil, orchis, fox-glove, thistle, cudweed, saw-wort, rose,

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rose, poppy, fumitory, and geranium. Red passes into blue in pimpnel. Blue is changed into white in bell-flower, greek-valerian, bindweed, columbine, violet vetch, milk-wort, goat's rue, viper's bugloss, comfrey, borrage, hyssop, dragon's head, scabious, blue-bottle, and succory. Blue is changed into yellow in crocus. Yellow passes easily into white in mellilot, agrimony, mullein, tulip, *blattaria*, or moth-mullein, and corn-marigold. White is changed into purple in wood-forrel, thorn-apple, pease, and daisy.

Although plants are sometimes observed to change their colour upon being moistened with coloured juices, yet that quality in vegetables seems not so much owing to the nature of their nourishment, as to the action of the internal and external air, heat, light, and the primitive organization of the parts. In support of this opinion, we may observe with Dr Grew, that there is a far less variety in the colours of roots than of the other parts of the plant; the pulp within the skin, being usually white, sometimes yellow, rarely red. That this effect is produced by their small intercourse with the external air appears from this circumstance, that the upper parts of roots, when they happen to stand naked above the ground, are often dyed with several colours: thus the tops of forrel roots turn red; those of turnips, mullein, and radishes, purple; and many others green; whilst those parts of the same roots which lie more under ground are commonly white. The green colour is so proper to leaves, that many, as those of sage, the young sprouts of St John's wort, and others which are reddish when in the bud, acquire a perfect green upon being fully expanded. In like manner, the leaves of the sea-side grape, (*polygonum*), which when young are entirely red, become, as they advance in growth, perfectly green, except the middle and transverse ribs, which retain their former colour.

As flowers gradually open and are exposed to the air, they throw off their old colour, and acquire a new one. In fact, no flower has its proper colour till it is fully expanded. Thus the purple stock-julyflowers are white or pale in the bud. In like manner bachelor's buttons, blue-bottle, poppy, red daisies, and many other flowers, though of divers colours when blown, are all white in the bud. Nay, many flowers change their colours thrice successively; thus, the very young buds of lady's looking-glass, bugloss, and the like, are all white; the larger buds purple, or murrey; and the open flowers blue.

With respect to the colours of the juices of plants, we may observe, that most resinous gums are tintured; some, however, are limpid; that which drops from the domestic pine is clear as rock-water. The milk of some plants is pale, as in burdock; of others white, as in dandelion, euphorbium, and scorzonera; and of others yellow, as in lovage, and greater celandine. Most mucilages have little colour, taste, or smell. Of all the colours above enumerated, green is the most common to plants, black the most rare.

Colour being a quality in plants so apt to change, ought never to be employed in distinguishing their species. These ought to be characterized from circumstances not liable to alteration by culture or other accidents. The same inconstancy of colour observed in the flowers, is likewise to be found in the other

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parts of plants. Berries frequently change from green to red, and from red to white. Even in ripe fruits, the colour, whether white, red, or blue, is apt to vary; particularly in apple, pear, plum, and cherry trees. Seeds are more constant in point of colour than the vessel which contains them. In the seeds, however, of the poppy, oats, pea, bean, and kidney-bean, variations are frequently observed. The root, too, although not remarkably subject to change, is found to vary in some species of carrot and radish. Leaves frequently become spotted, as in a species of orchis, hawk-weed, ranunculus, knot-grass, and lettuce; but seldom relinquish their green colour altogether. Those of some species of amaranthus, or flower-gentle, are beautifully coloured. The spots that appear on the surface of the leaves are of different colours, liable to vary, and not seldom disappear altogether. The leaves of officinal lung-wort, and some species of sow-bread, forrel, trefoil, and ranunculus, are covered with white spots. Those of dog's-tooth violet, with purple and white. Those of several species of ranunculus, and orchis with black and purple. Those of amaranthus tricolor, with green, red, and yellow. Those of ranunculus acris, and a species of bog-bean, with red or purple. The under surface of the leaves of some species of pimpnel and the sea-plantain is marked with a number of dots or points; a white line runs through the leaves of Indian reed, black-berried heath, and a species of Canary grass: and the margin or brim of the leaf, in some species of box, honeysuckle, ground-ivy, and the evergreen oak, is of a silver-white colour. The whole plant is often found to assume a colour that is unnatural or foreign to it. The varieties in some species of eryngo, mug-wort, orrach, amaranthus, purslane, and lettuce, furnish examples.

Such being the inconstancy of colour in all the parts of the plant, specific names derived from that quality are very properly, by Linnæus, deemed erroneous; whether they respect the colour of the flower, fruit, seeds, root, leaves, or express in general the beauty or deformity of the entire plant, with a particular view to that circumstance. Of this impropriety, committed by former botanists, Linnæus himself is not always guiltless. Thus the two species of *farracena*, or the side-saddle flower, are distinguished by the colour of their petals into the yellow and purple *farracena*; although the shapes and figure of the leaves afforded much more constant as well as striking characters. The same may be said of his *lupinus albus* and *luteus*; *reseda alba*, *glauca*, and *lutea*; *angelica atro-purpurea*; *dictamnus albus*; *lamium album*; *selago coccinea*; *sida alba*; *passiflora rubra*, *lutea*, *incarnata*, and *cœrulea*; and of many others, in which the specific name is derived from a character or quality that is so liable to vary in the same species.

We shall conclude this article with observing, that of all sensible qualities, colour is the least useful in indicating the virtues and powers of vegetables. The following general positions on this subject are laid down by Linnæus, and seem sufficiently confirmed by experiment. A yellow colour generally indicates a bitter taste; as in gentian, aloe, celandine, turmeric, and other yellow flowers. Red indicates an acid or sour taste; as in cranberries, barberries, currants, raspberries, mulberries, cherries; the fruit of the rose, sea-buck-

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thorn, and service-tree. Herbs that turn red towards autumn, have likewise a sour taste; as sorrel, wood-sorrel, and bloody dock. Green indicates a crude alkaline taste, as in leaves and unripe fruits. A pale colour denotes an insipid taste, as in endive, asparagus, and lettuce. White promises a sweet luscious taste; as in white currants and plums, sweet apples, &c. Lastly, black indicates a harsh, nauseous, disagreeable taste; as in the berries of deadly nightshade, myrtle-leaved fumach, herb-christopher, and others; many of which are not only unpleasent to the taste, but pernicious and deadly in their effects.

To be ascertained of the acid or alkaline property of any plant, express some of the juice, and rub it upon a piece of blue paper; which, if the plant in question is of an acid nature, will turn red; if of an alkaline, green. For the methods of extracting colours from the different parts of plants, see the article *COLOUR-MAKING*.

Difference of Colour of the Human Species. See COMPLEXION.

COLOUR, in Heraldry. The colours generally used in heraldry are, red, blue, black, green, and purple; which the heralds call *gules, azure, sable, vert or sinople, and purpure*; tenne, or tawny, and sanguine, are not so common; as to yellow and white, called *or* and *argent*, they are metals, not colours.

The metals and colours are sometimes expressed in blazon by the names of precious stones, and sometimes by those of planets or stars. See *BLAZONING*.

CEnomachus is said first to have invented the distinctions of colours, to distinguish the gundillæ of combatants at the Circensian games; the green for those who represented the earth, and blue for those who represented the sea.

COLOURS, in the military art, include the banners, flags, ensigns, &c. of all kinds, borne in the army or fleet. See *FLAG* and *STANDARD*.

COLOURS, in the Latin and Greek churches, are used to distinguish several mysteries and feasts celebrated therein.

Five colours only are regularly admitted into the Latin church: these are white, green, red, violet, and black. The white is for the mysteries of our Saviour, the feast of the Virgin, those of the angels, saints, and confessors: the red is for the mysteries and solemnities of the holy sacrament, the feasts of the apostles and martyrs; the green for the time between pentecost and advent, and from epiphany to septuagesima; the violet in advent and Christmas, in vigils, rogations, &c. and in votive masses in time of war; lastly, the black is for the dead, and the ceremonies thereto belonging.

In the Greek church, the use of colours is almost abolished, as well as among us. Red was, in the Greek church, the colour for Christmas and the dead, as black among us.

To Colour Strangers Goods, is when a freeman allows a foreigner to enter goods at the customhouse in his name.

COLOUR-MAKING, the art of preparing the different kinds of colours used in painting.

This art properly belongs to chemistry; and is one of the most curious, though least understood, parts of it. The principles on which colour-making depends

are entirely different from those on which the theory of other parts of chemistry is founded; and the practical part being in the hands of those who find it their interest to conceal their methods as much as possible, it thence happens, that there is not only no distinct theory of this art, but scarce a single good receipt for making any one colour hath ever appeared.

The first general division of colours is into opaque and transparent. By the first are meant such colours as, when laid over paper, wood, &c. cover them fully so as to efface any other painting or stain that might have been there before; the others are of such a nature as to leave the ground on which they are laid visible through them. Of the first kind are white-lead, red-lead, vermilion, &c.; of the latter kind are the colours used for illuminating maps, &c.

Another division is into oil-colours and water-colours; by which is meant such as are appropriated to painting in oil and in water. Most of those which are proper for painting in water, are also proper for being used in oil. There is, however, this remarkable difference betwixt colours when mixed with water and with oil, that such as are quite opaque in water will become perfectly transparent in oil. Thus, blue verditer, though exceedingly opaque in water, if ground with oil, seems totally to dissolve, and will become very transparent. The same thing happens to such colours as have for their basis the oxide of tin, alabaster, or calcareous earth. The most perfectly opaque colours in oil are such as have lead, mercury, or iron, for their basis: to the latter, however, Prussian blue is an exception; for though the basis of that colour is iron, it proves quite transparent when ground with oil. In water-colours, those prepared from metals, Prussian blue alone excepted, are always opaque; from vegetables or animals, transparent. Coals, however, whether vegetable or animal, are opaque both in water and oil.

Colours, again, may be considered as either simple or compound. The simple ones are such as require no compound thing to be superadded to them, in order to make a full strong colour, without regarding whether they are formed of many or few ingredients; and in this view, white-lead, red-lead, vermilion, oxides of iron, &c. are simple colours. The compound ones are formed by the union of two or more colouring substances; as blue and yellow united together to form a green, red and yellow to form an orange, a white earth or oxide with the red colour of cochineal or brazil to form a lake, &c.; and thus carmine, lake, rose-pink, Dutch-pink, English-pink, &c. are compound colours.

The last and most important division of colours is into true and false. By the former are meant those which retain their colour under every possible variety of circumstances, without fading in the least: the others are such as do not; but either lose their colour altogether, or change to some other. What is chiefly apt to affect colours, is their being exposed to the sun in summer, and to the cold air in winter: but to this there is one exception, viz. white-lead; which, when ground with oil, retains its whiteness if exposed to the weather, but degenerates into a brownish or yellowish colour if close kept. In water this substance is very apt to lose its colour, whether exposed to the air or not.

Colour-
making.1
Division of
colours in-
to opaque
and trans-
parent.2
Oil and wa-
ter colours.3
Simple and
compound
ones.4
True and
false co-
lours.

Colour-making. not. The great desideratum in colour-making is to produce the first kind of colours, viz. such as will not fade by exposure to the weather; and indeed it is to be regretted, that the most beautiful are in general the least permanent. It may, for the most part, however, be expected, that the more simple any colour is, the less liable will it be to change upon exposure to the air.

The great difficulty of knowing *à priori* whether a colour will fade or not, is owing to our ignorance concerning the nature of colouring substances. With all our disadvantages, however, we may observe, that whatever change of colour is produced in any substance by exposure to the sun and air, that colour to which it changes will bid fair for being permanent, and therefore ought to be employed where it can be done. Of these changes the instances are but very rare.

5 Instances of colours produced by exposure to the sun and air. One is in the purple of the ancients, which assumed its colour by exposure to the sun, and consequently was exceedingly permanent. Another is in the solution of silver; which, being mixed with chalk, the precipitate turns to purplish black where it is exposed to the sun. A third is in solutions of indigo by alkaline substances, which constantly appear green till exposed to the air by spreading them very thin, upon which they become almost instantaneously blue, and continue so ever after. Sometimes, though still more rarely, a very remarkable change of colour happens, upon mixing two vegetable juices together. Almost the only instance of this we have on the authority of Mr George Forster, who informs us, that the inhabitants of Otaheite dye their cloth of a crimson colour, by mixing together the yellow juice of a small species of fig with the greenish juice of a kind of fern. But the most remarkable alterations of colour are effected by different metallic and saline solutions mixed with certain animal or vegetable substances; and with these the colour-maker will be principally conversant.

6 By the mixture of two vegetable juices. It is a common observation in chemistry, that acids mixed with blue vegetable juices turn them red, and alkalies green. It is equally certain, though not so generally known, that acids of all kinds generally tend to heighten red colours, so as to make them approach to the scarlet or true crimson; and alkalies to darken, or make them approach to blue or purple. Mixed with yellow colours, acids also universally tend to brighten the yellow; and alkalies to turn it to an orange, and make it become more dull. But though this is very generally the case, we are not to expect that all acids are equally powerful in this respect. The nitric acid is found to heighten the most of any, and the muriatic acid the least of the mineral ones. The vegetable, as might be expected, are less powerful than the mineral acids. Thus, if with a tincture of cochineal, either in water or alcohol, is mixed the pure nitrous acid, it will change the colour to an exceeding high orange or flame colour, which it will impart to cloth. If sulphuric acid is used, a full scarlet, inclining to crimson rather than orange, is produced. With muriatic acid a true crimson colour, bordering on purple, is the consequence. Alkalies, both fixed and volatile, change the colour to a purple, which is brighter with the volatile than the fixed alkalies.

7 Effects of acids and alkalies on colours. Here it is obvious, that whatever colours are pro-

duced by the mixture of different substances together; the permanency of these colours can only be in proportion to the ability of such mixtures to resist the weather. Thus, suppose a high scarlet or orange colour is produced by means of spirit of nitre, it is plain that, was such a colour exposed to the air, it could remain no longer than the spirit of nitre which produced it remained. In proportion, therefore, as the spirit of nitre was exhaled into the air, or otherwise destroyed, the colour behaved to fade, and at last to be totally destroyed; and thus, in proportion to the destructibility of the substances by which colours are produced, will be the disposition of such colours to fade, or the contrary. In this respect alkalies are much more destructible than acids, and consequently less proper for the preparation of colours. With regard to acids, the nitric seems most destructible, the sulphuric less so, and the muriatic the least of all. From the extreme fixity of the phosphoric acid and sedative salt, perhaps they might be of service in preserving colours.

As all colours, whether derived from the animal or vegetable kingdom, must be extracted either by pure water or some other liquid menstruum, they cannot be used for the purposes of painting till the colouring substance is united with some earthy or solid matter, capable of giving it a *body*, as the workmen call it; and according to the nature of this substance, the colour will be transparent or otherwise. This basis ought to be of the most fixed and durable nature; unalterable by the weather, by acids, or by alkalies. It ought also to be of a pure white colour, and easily reducible into an impalpable powder. For this reason all earthy substances should be avoided as being acted upon by acids; and therefore, if any of these were added to heighten the colour, they would not fail to be destroyed, and their effect totally lost. Precipitates of lead, bismuth, &c. though exceedingly fine and white, ought also to be avoided, as being apt to turn black by exposure. The only substance to be chosen in preference to all others, is oxide of tin, prepared either by fire or the nitric acid. This is so exceedingly refractory as not only to be unalterable by alkalies, acids, or the sun and weather, but even by the focus of a very large burning mirror. It is besides white as snow, and capable of being reduced to an extreme degree of fineness, insomuch that it is made use of for polishing metallic speculums. For these reasons, it is the most proper basis for all fine colours. For coarse ones, the white precipitate of lead, mentioned under the article CHEMISTRY, will answer very well. It hath a very strong body, i. e. is very opaque, and will cover well; may be easily ground fine, and is much less apt to turn black than white lead; it is besides very cheap, and may be prepared at the small expence of 3d. per pound.

If what we have just now observed is attended to, the general method of extracting colours from any vegetable or animal substance, and fixing them on a proper basis, must be very easily understood. For this purpose, a quantity of oxide of tin is to be procured in proportion to the quantity of colour desired. This must be well rubbed in a glass mortar, with a little of the substance designed for brightening the colour, as alum, cream of tartar, spirit of nitre, &c. after which it must be dried, and left for some time,

Colour-making. 8 Permanency of colours, by what determined.

9 Opaque or transparent colours, how formed.

10 Oxide of tin, the most proper basis for fine colours.

11 Precipitate of lead most proper for coarse ones.

12 General method of preparing colours.

Colour-making.

that the union between the two substances may be as perfect as possible. If the colour is to be a very fine one, suppose from cochineal, the colouring matter must be extracted with alcohol without heat. When the spirit is sufficiently impregnated, it is to be poured by little and little upon the oxide, rubbing it constantly, in order to distribute the colour equally through all parts of the oxide. The spirit soon evaporates, and leaves the oxide coloured with the cochineal. More of the tincture is then to be poured on, rubbing the mixture constantly as before; and thus, with proper management, may very beautiful colours, not inferior to the best carmine, be prepared at a moderate expence. If, instead of cochineal, we substitute brazil-wood, turmeric, logwood, &c. different kinds of red, yellow, and purple, will be produced. For the coarser colours, aqueous decoctions are to be used in a similar manner; only as these are much longer in evaporating than the alcohol, very little must be poured on at a time, and the colours ought to be made in large quantity, on account of the tediousness of the process.

13
Effects of different kinds of salts.

Hitherto we have considered only the effects of the pure and simple salts, viz. acids and alkalies, on different colours; but by combining the acids with alkalies, earths, or metals, these effects may be varied almost *in infinitum*; neither is there any rule yet laid down by which we can judge *à priori* of the changes of colour that will happen on the admixture of this or that particular salt with any colouring substance. In general, the perfect neutrals act weakly; the imperfect ones, especially those formed from metals, much more powerfully. Alum and sal ammoniac considerably heighten the colour of cochineal, brazil, turmeric, fustic, madder, logwood, &c. The same thing is done, though in a less degree, by common salt, Glauber's salt, nitre, and many other neutrals. Solutions of iron in all the acids strike a black with every one of the above-mentioned substances; and likewise with fumach, galls, and other astringents. Solutions of lead, or saccharum saturni, universally debase red colours to a dull purple. Solution of copper changes the purple colour of logwood to a pretty good blue; and, in general, solutions of this metal are friendly to blue colours. The effects of solutions of gold, silver, and mercury, are not so well known; they seem to produce dark colours of no great beauty.

14
Solution of tin the most powerful.* See *Chromatics*, N^o 8.

The most powerful solution, however, with regard to a great number of colours, is that of tin, made in nitro-muriatic acid. Hence we may see the fallacy of Mr Delaval's hypothesis concerning colours*, that the least refrangible ones are produced by the most dense metals: for tin, which hath the least density of any metal, hath yet, in a state of solution, the most extraordinary effects upon the least refrangible colours as well as those that are most so. The colour of cochineal is changed by it into the most beautiful scarlet; a similar change is made upon the colouring matter of gum-lac. Brazil-wood is made to yield a fine purplish crimson; logwood, a beautiful dark purple; turmeric, fustic, weld, and all yellow-colouring woods and flowers, are made to communicate colours far more beautiful than can be got from them by any other method. The blue colour of the flowers of violets,

eye-bright, iris, &c. are heightened so as to equal, if not excel, the blue produced by a solution of copper in volatile alkali. In short, this solution seems to be of much more extensive use in colour-making, when properly applied, than any thing hitherto thought of. It is not, however, universally serviceable. The colour of madder it totally destroys, and likewise that of safflower, changing them both to a dull orange. It likewise spoils the colour of archil; and what is very remarkable, the fine red colour of tincture of roses made with sulphuric acid is by solution of tin changed to a dirty green.

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The most important consideration in colour-making is to make choice of such materials as produce the most durable colours; and if these can be procured, an ordinary colour from them is to be preferred to a bright one from those which fade sooner. In what the difference consists between the colours that fade and those which do not, is not known with any degree of certainty. From some appearances it would seem, that those substances which are most remarkable for keeping their colour contain a viscous glutinous matter, so combined with a resinous one as to be soluble both in water and alcohol. The most durable red colour is prepared from gum-lac. This is very strongly resinous, though at the same time so far glutinous, that the colouring matter can be extracted from it by water. Next to gum-lac are madder roots and cochineal. The madder is an exceedingly penetrating substance, inasmuch that, when given to animals along with their food, it tinges their bones of a deep red colour. Its colouring matter is soluble both in water and alcohol. Along with the pure red, however, there is in madder a kind of viscous astringent substance, of a dark brown colour, which seems to give the durability to the whole. The colouring matter of cochineal, though soluble both in water and alcohol, is very tenacious and mucilaginous, in which it bears some resemblance to the *purpura* of the ancients, which kept its colour exceedingly well. Where the colours are fugitive, the tinging substance seems to be too resinous or too mucilaginous. Thus the colours of brazil, turmeric, &c. are very resinous, especially the latter, inasmuch that the colouring matter of turmeric can scarcely be extracted by water. Both these are perishable, though beautiful colours; and much more are the red, purple, and blue flowers, commonly to be met with. These seem to be entirely mucilaginous, without the least quantity of resinous matter. The yellow flowers are different, and in general keep their colour pretty well. Whether it would be possible, by adding occasionally a proper quantity of gum or resin, to make the fugitive colours more durable, hath not yet been tried, but seems to have some probability. What tends a little to confirm this, is a process given by M. Hellot for imparting durability to the colour of brazil. It consists only in letting decoctions of the wood stand for some time in wooden casks till they grow stale and *ropy*. Pieces of woollen cloth now dyed in the liquor acquired a colour so durable, that they were not in the least altered by exposure to the air during four months in the winter season. Whether this change in the durability of the colour was effected by the ropiness following the fermentation,

15
Directions for the choice of colouring materials.16
M. Hellot's method of improving the durability of brazil-wood.

Colour-making.

tion, or by some other cause, or whether the experiment can be at all depended upon, must be referred to future observation.

17
Preparation of different colours.

Having thus collected all that can as yet be depended upon for establishing a general theory of colour-making, we shall now proceed to give an account of the different pigments generally to be met with in the colour-shops.

18
Lamp-black.

1. *Black.* These are lamp-black, ivory-black, blue-black, and Indian-ink. The first is the finest of what are called the foot-blacks, and is more used than any other. Its preparation is described in the Swedish Transactions for the year 1754, as a process dependent on the making of common resin: the impure resinous juice collected from incisions made in pine and fir trees, is boiled down with a little water, and strained whilst hot through a bag; the dregs and pieces of bark left in the strainer are burnt in a low oven, from which the smoke is conveyed through a long passage into a square chamber, having an opening on the top on which is a large sack made of thin woollen stuff: the foot, or lamp-black, concretes partly in the chamber, from whence it is swept out once in two or three days, and partly in the sack, which is now and then gently struck upon, both for shaking down the foot, and for clearing the interstices betwixt the threads, so as to procure a sufficient draught of air through it. In this manner lamp-black is prepared at the turpentine houses in England, from the dregs and refuse of the resinous matters which are there manufactured.

19
Dr Lewis's observations.

On this subject Dr Lewis hath some curious observations. "The foot (says he) arising in common chimneys, from the more oily or resinous woods, as the fir and pine, is observed to contain more dissoluble matter than that from the other woods; and this dissoluble matter appears, in the former, to be more of an oily or resinous nature than in the latter, alcohol extracting it most powerfully from the one, and water from the other. The oiliness and solubility of the foot seeming therefore to depend on those of the subject it is made from, it has been thought that lamp-black must possess these qualities in a greater degree than any kind of common foot. Nevertheless, on examining several parcels of lamp-black, procured from different shops, I could not find that it gave any tincture at all, either to alcohol or to water.

"Suspecting some mistake or sophistication, or that the lamp-black had been burnt or charred, as it is to fit it for some particular uses, I prepared myself some foot from linseed oil, by hanging a large copper pan over the flame of a lamp to receive its smoke. In this manner the more curious artists prepare lamp black for the nicer purposes; and from this collection of it from the flame of a lamp, the pigment probably received its name. The foot so prepared gave no tincture either to water or to alcohol, any more than the common lamp-black of the shops. I tried different kinds of oily and resinous bodies with the same result; even the soots obtained from fish-oils and tallow did not appear to differ from those of the vegetable-oils and resins. They were all of a finer colour than the lamp-black commonly sold.

"Some foot was collected in like manner from fir and other woods, by burning small pieces of them

slowly under a copper-pan. All the soots were of a deeper black colour than those obtained from the same kinds of woods in a common chimney; and very little, if at all, inferior to those of the oils: they gave only a just discernible tincture to water and alcohol, while the soots of the chimney imparted a strong deep one to both. The foot of mineral bitumens, in this close way of burning, appears to be of the same qualities with those of woods, oil, and resins: in some parts of Germany, great quantities of good lamp-black are prepared from a kind of pit-coal.

"It appears, therefore, that the differences of soots do not depend altogether on the qualities of the subjects, but in a great measure on the manner in which the subject is burnt, or the foot caught. The soots produced in common chimneys, from different kinds of wood, resinous and not resinous, dry and green, do not differ near so much from one another, as those which are produced from one kind of wood in a common chimney, and in the confined way of burning above mentioned."

Ivory-black is prepared from ivory or bones burnt in a close vessel. This, when finely ground, forms a more beautiful and deeper colour than lamp-black; but in the common methods of manufacturing, it is so much adulterated with charcoal-dust, and so grossly levigated, as to be unfit for use. An opaque deep black for water-colours, is made by grinding ivory-black with gum-water, or with the liquor which settles from the whites of eggs after they have been suffered to stand a little. Some use gum-water and the whites of eggs together, and report, that a small addition of the latter makes the mixture flow more freely from the pencil, and improves its glossiness. It may be observed, however, that though ivory-black makes the deepest colour in water as well as in oil-painting, yet it is not on this account always to be preferred to other black pigments. A deep jet-black colour is seldom wanted in painting; and in the lighter shades, whether obtained by diluting the black with white bodies, or by applying it thin on a white ground, the particular beauty of the ivory-black is in a great measure lost.

Blue black is said to be prepared from the burnt stalks and tendrils of the vine. These, however, the colour-makers seldom give themselves the trouble of procuring, but substitute in its place a mixture of ivory-black and the common blue used for clothes.

Indian-ink is an excellent black for water-colours. It hath been discovered by Dr Lewis to consist of a mixture of lamp-black and common glue. Ivory-black, or charcoal, he found to answer equally well, provided they were levigated to a sufficient degree of fineness, which indeed requires no small trouble.

2. *White.* The white colours commonly to be met with are, white-flake, white-lead, calcined hartshorn, pearl-white, Spanish-white, egg-shell-white, and nitrate of bismuth. The flake-white and white-lead are properly the same. The preparation of the former is kept a secret; the method of preparing the latter is described under CHEMISTRY, N^o 1856. These are the only whites that can be used in oil, all the rest being transparent unless they are laid on with water. Calcined hartshorn is the most useful of the earthy whites, as being the least alkaline. Spanish-white is only finely

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20-
Ivory-black.21-
Blue-black.22-
Indian-ink.23-
White colours.

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finely prepared chalk. Pearl-white is made from oyster-shells; and egg-shell white from the shells of eggs. All these, by their attraction for acids, must necessarily destroy such colours as have any acid or metallic salt in their composition. The nitrate of bismuth is apt to turn black, as are also flake-white and white-lead, when used in water. The white precipitate of lead recommended under CHEMISTRY, N^o 1856. is greatly superior as a water-colour to all these, being perfectly free of any alkaline quality, and not at all apt to lose its own colour, or to injure that of other substances. It is a carbonate of lead.

Red colours.

3. *Red.* The red colours used in painting are of two sorts, viz. those which incline to the purple, and such as are of a full scarlet and tend rather to the orange. The first are carmine, lake, rose-pink, red-ochre, and Venetian-red. The second are vermilion, red-lead, scarlet-ochre, common Indian-red, Spanish-brown, and terra di Sienna, burnt.

We have already laid down some general rules for the preparation of carmine and lake. Particular receipts have been delivered with the greatest confidence for making these fine colours; but all of them must necessarily prove ineffectual, because an earthy basis is recommended for striking the colour upon. From the principles of chemistry, however, we are certain, that if nitric acid, or solution of tin, is made use of for brightening a colour made with any earthy basis, it must infallibly be destroyed by that basis, by reason of its alkaline quality. Carmine is the brightest and most beautiful red colour known at present; the best comes from France. Lake differs from it in being capable of mixture with oil, which carmine is not, unless with great difficulty. The former is also much more inclined to purple than carmine. This last quality, however, is reckoned a defect; and accordingly, the more that lake approaches to the scarlet or true crimson, the more it is valued. On dropping solution of tin into an aqueous tincture of brazil-wood, a beautiful precipitate falls, of a purplish crimson colour. This may be very well substituted in place of the dearer lakes on many occasions.

Rose-pink is a very beautiful colour, inclining more to the purple than scarlet. It seems to be made of chalk, coloured with a decoction of brazil-wood, heightened by an alkaline salt; for which reason it is exceedingly perishable, and but little esteemed. The colour might be made much more durable as well as better, by employing for a basis the white precipitate of lead above-mentioned, and brightening it with solution of tin.

Red ochre and Venetian red differ in nothing from the colcothar of vitriol well calcined. The oxides of iron may be made to appear either purplish, or inclining to the scarlet, according to the manner in which the calcination is performed. If the matter is perfectly deprived of its phlogiston, and subjected to an intense fire, it always turns out red; but the mixture of a small quantity of inflammable matter gives it a purplish cast. Hence various paints are kept in the shops under different names, which yet differ from each other only in the slight circumstance above mentioned; and such are the scarlet-ochre, Spanish-brown, and terra di Sienna burnt. It is remarkable, that the oxides of iron never show their colour till they become cold.

Colcothar of vitriol, while hot, always appears of a very dark dusky purple. Colour-making.

Of the preparation of vermilion and red lead, an account is given under the article CHEMISTRY, N^o 1701. 1832. These are very durable colours; the first is the best red used in oil painting, but does not answer well in water; the other is rather an orange; and, like other preparations of lead, is in some cases apt to turn black.

3. *Orange.* The only true orange-coloured paints are red orpiment and orange lake. The first is a sublimate formed of arsenic and sulphur: the other may be prepared from turmeric infused in alcohol having its colour struck upon oxide of tin, and brightened by a solution of that metal. All the shades of orange, however, may be extemporaneously prepared by mixing red and yellow colours together, in due proportions. Orange colours.

5. *Yellow.* The yellow paints most commonly in use are, king's-yellow, Naples-yellow, Dutch-pink, English-pink, masticot, common orpiment, yellow-ochre, terra di Sienna unburnt, and turpith-mineral. Yellow colours.

King's-yellow is evidently an arsenical preparation. Its colour is exceedingly beautiful, but apt to fade, on which account, and its great price, it is seldom used.

Naples-yellow was for a long time thought to be a preparation of arsenic, but is now discovered to have lead for its basis. It is therefore apt to turn black and lose its colour, which makes it the less valuable. It is nevertheless used in preference to king's-yellow, on account of its inferiority in price. This colour is particularly liable to be spoiled by iron when moist, and therefore should never be touched by that metal unless previously ground in oil.

Dutch-pink is said to be prepared by striking the colour of yellow berries upon finely levigated chalk. But of this there is great reason to doubt; the basis of Dutch-pink seems much more hard and gritty than chalk, and its colour more durable than those struck upon that earth usually are. Very good yellows may be prepared with the white precipitate of lead, formerly mentioned, by using either yellow berries, fustic, or any other substance capable of yielding that colour. English pink is paler than the Dutch, and keeps its colour greatly worse.

Masticot is prepared by calcining white-lead till it assumes a yellowish colour. It is not apt to change, but the colour is so dull that it is seldom used either in oil or water.

Common orpiment is a pretty bright greenish-yellow, prepared by subliming arsenic with sulphur. Its nauseous smell, which is greatly increased by grinding in oil, makes it very disagreeable; nor does it keep its colour for any length of time. That kind of orpiment least inclined to green is to be preferred for the purposes of painting.

Yellow-ochre and terra di Sienna are ferruginous earths, capable of becoming red by calcination. Green vitriol precipitated by lime may be advantageously substituted for either of them. See CHEMISTRY.

Turpith mineral is but little used in painting, though its fine yellow colour seems greatly to recommend it. This preparation is in all probability very durable; and

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and should seem therefore worthy of a preference either to king's or Naples yellow. See CHEMISTRY Index.

Gamboge is a paint that can only be used in water, and is the most common yellow made use of for colouring maps, &c. but for this it is not very proper, being neither quite transparent, nor very durable.

27
Green colours.

6. *Green.* The only simple green colour that hath a tolerable degree of brightness is verdigris, or preparations of it. This, however, though a very beautiful colour, is far from being durable. It is improved in colour, though not in durability, by dissolution and crystallization in distilled vinegar, in which state it is called *distilled verdigris*. A more durable water-colour is made by dissolving the verdigris in cream of tartar, or rather the pure tartaric acid; but in oil this is found to be equally fugitive with the verdigris itself. See CHEMISTRY Index.

Compound greens are either made of Prussian or some other blue, mixed with yellow; but in whatever way these colours can be compounded, the beauty of the green produced is greatly inferior to distilled, or even common verdigris. The tartaric solution of verdigris, mixed with a little gamboge, is the best transparent green water-colour we have had an opportunity of trying; and a mixture of Prussian blue and turpith-mineral is probably the best opaque one.

Sap-green is a simple colour, but exceedingly inferior to distilled verdigris, or even to the tartaric solution of verdigris with gamboge. It is prepared from the juice of unripe buckthorn berries evaporated to the consistence of a gum. Its green colour is greatly inclined to yellow. A kind of compound green has been sometimes used, called *Prussian-green*, which consists only of Prussian blue and yellow ochre. It has no beauty, nor is it durable. It is prepared as Prussian blue, only not pouring on any muriatic acid to dissolve the ochreous sediment which falls at the same time.

Another green sometimes used is called *terre verte*. This is a native earth, probably impregnated with copper. It is of a bluish-green colour, much of that tint called *sea-green*. It is gritty, and therefore must be well levigated before it is used. Its colour is durable, but not very bright.

28
Blue colours.

7. *Blue.* The blue colours are ultramarine, Prussian-blue, verditer, smalt, bice, and indigo. Of these the ultramarine is the finest, but its great price hinders its being much used. It is a preparation from lapis lazuli; is an exceeding bright colour, and never fades with whatever substance it is mixed. It is now, however, in a great measure superseded by Prussian blue, to the disadvantage of painting in general; as Prussian blue, though very beautiful, is far from being durable. For an account of its preparations see the article ULTRAMARINE.

The process for making Prussian blue is described, and its nature fully considered, under CHEMISTRY, N^o 774; so that it is sufficient here to observe, that Prussian blue is to be accounted of the best quality when it is deep, bright, and not inclined to purple. It ought to be tried by mixture with white lead, as the brightness of the colour will appear much more when diluted than when concentrated in the lumps of the blue itself.

The preparation of blue verditer is kept a secret, and

the best chemists have been puzzled to find out the method. The colour is exceedingly bright, and has a considerable tinge of green. A method of preparing a colour equally beautiful, and agreeing in all respects with what is sold in the shops, except that of effervescing with acids, we have found to be as follows: Dissolve copper in strong caustic alkali, until the liquid has assumed a very deep blue colour; and the deeper this colour is, the finer will your verditer be. When the menstruum has dissolved as much of the metal as it can take up, it is to be poured out into a broad and well glazed earthen pan, held over a very gentle fire; and from the moment it is put on the liquor is to be continually agitated with a wooden spatula, so that the liquor may be heated as equally as possible. The whole secret consists in properly regulating the degree of heat; for if it exceeds the due proportion ever so little, the verditer will turn out of a dirty green. The proper degree is about 90^o of Fahrenheit's thermometer. In this gentle heat the alkali slowly evaporates; and in proportion to its doing so the verditer falls to the bottom. After it is once formed, freed from the alkaline liquor, and dried, it can bear the affusion of boiling water without the least injury. Dr Priestley, in his sixth volume, takes notice, that a solution of copper in volatile alkali affords a blue precipitate by heat, but without taking notice of the requisites for its success. In making this preparation it is necessary to dissolve copper in its metallic state; for the solution of any oxide will not yield a blue but a green colour. This colour is durable in water, but dissolves in oil, and has then all the inconveniences of verdigris above mentioned.

Smalt is glass coloured with zaffre, a preparation from cobalt*. It is commonly so grossly powdered* See Zaffre and Smalt. that it cannot be used in painting, and its texture is so hard that it cannot easily be levigated. Its colour is exceedingly bright and durable; so that when finely levigated it is used instead of ultramarine. The most proper materials for levigating this substance seem to be the plates of M. Reaumur's porcelain recommended by Dr Lewis. See CHEMISTRY Index. For the preparation and qualities of bice, see the articles ARMENUS LAPIS and BICE.

Indigo is but little used in painting either in oil or water, on account of the dulness of the colour. It requires no other preparation than being washed over. Its goodness is known by the darkness and brightness of the colour. See INDIGO.

8. *Purple.* The only simple colour of this kind used at present is colcothar of vitriol. A beautiful purple lake may be prepared from logwood by means of solution of tin; but this method of preparing colours is very little known as yet.

9. *Brown.* The brown colours are, bistre, brown-ochre, Cologne-earth, umbre, and brown-pink. Under the article BISTRE is given a process for making that colour, by infusing foot in water, pouring off the tincture, and then evaporating it to an extract; but Dr Lewis is of opinion, with M. Landois in the French *Encyclopédie*, that the foot is either boiled in water or ground with a little liquid of some kind into a smooth paste; it is then diluted with more water, and after standing for about half an hour till the grosser substance of the foot has settled, the liquor is poured off

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into another vessel, and set by for two or three days, that the finer parts may fall to the bottom, and this fine matter is the bistre. This is a very useful colour in water, being exceedingly fine, durable, and not apt to spoil any other colours with which it is mixed. The brown pink is said to consist of chalk tinged with the colouring matter of fustic, heightened by fixed alkaline salts. It is therefore very perishable, and is seldom used. The other browns are a kind of ochreous earths; for a description of which see their proper articles.

32
Attempts to make lake of all colours.

Having now considered most of the colouring substances usually to be met with in the shops, we shall next take notice of some attempts that have been made to produce all the different colours from vegetables, after the manner of lakes; which, though the methods hitherto tried have for the most part failed of success, may perhaps some time or other be found applicable to valuable purposes.

33
Black from astringents.
* See Dyeing.

From infusions of astringent vegetables mixed with green vitriol, is produced a deep black liquor of very extensive use in dyeing*. The substances which produce the deepest blacks are galls and logwood. When a decoction or infusion of the galls is dropped into a solution of the vitriol largely diluted with water, the first drops produce bluish or purplish red clouds, which soon mingling with the liquor, turn it uniformly of their own colour. It seems to be on the quality of the water that this difference in the colour depends. With distilled water, or the common spring-waters, the mixture is always blue. If we previously dissolve in the water the most minute quantity of any alkaline salt, too small to be discovered by any of the common means by which waters are usually tried, or if the water is in the least putrid, the colour of the mixture proves purple or reddish. Rain-water, caught as it falls from the clouds in an open field in clean glass-vessels, gives a blue; but such as is collected from the tops of the houses, grows purple with the mixture of vitriol and galls: from whence it may be presumed, that this last has contracted a putrid tendency, or received an alkaline impregnation, though so slight as not to be sensible on other ways of trial.

Both the purple and blue liquors, on adding more of the astringent infusion, deepen to a black, more or less intense according to the nature of dilution: if the mixture proves of a deep opaque blackness, it again becomes bluish or purplish when further diluted. If suffered to stand in this diluted state for two or three days, the colouring matter settles to the bottom in form of a fine black mud, which by slightly shaking the vessel, is diffused again through the liquor, and tinges it of its former colour. When the mixture is of a full blackness, this separation does not happen, or in a far less degree; for though a part of the black matter precipitates in standing, yet so much remains dissolved, that the liquor continues black. This suspension of the colouring substance, in the black liquid, may be attributed in part to the gummy matter of the astringent infusion increasing the consistence of the watery fluid; for the separation is retarded in the diluted mixture by a small addition of gum arabic. If the mixture either in its black or diluted state is poured into a filter, the liquor passes through coloured; only a part of the black matter remaining on the

filter. The filtered liquor on standing for some time becomes turbid and full of fine black flakes: being freed from these by a second filtration, it again puts on the same appearance; and thus repeatedly till all the colouring parts are separated, and the liquor has become colourless.

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Dr Lewis, from whose Philosophical Commerce of Arts this account is taken, further informs us, that this colouring matter, when separated from the liquor and dried, appeared of a deep black, which did not seem to have suffered any change from the air by exposure for upwards of four months. Made red-hot, it glowed and burnt, but did not flame, and became a rusty brown powder, which was readily attracted by a magnetic bar; though in its black state the magnet had no action upon it. Sulphuric acid, diluted with water and digested on the black powder, dissolved the greatest part of it, leaving only a very small quantity of whitish matter. Solution of pure fixed alkaline salt dissolved very little of it: the liquor received a reddish brown colour, and the powder became blackish brown. This residuum was attracted by the magnet after being red-hot, though not before: the alkaline tincture, passed through a filter, and mixed with a solution of green vitriol, struck a deep brownish black colour, nearly the same with that which results from mixing with the vitriolic solution an alkaline tincture of galls.

It hath also been attempted to produce black from a combination of other colours; as green may be produced from a mixture of blue and yellow. M. le Blon, in his Harmony of Colours, gives a method of forming black, by mixing together the three colours called *primitive*, viz. blue, red, and yellow; and M. Castel, in his *Optique des Couleurs*, published in 1740, says that this compound black has an advantage in painting, above the simple ones, of answering better for the darkening of other colours. Thus, if blue, by the addition of black, is to be darkened into the colour called *blue-black*, the simple blacks, according to him, if used in sufficient quantity to produce the requisite deepness, conceal the blue, while the compound blacks leave it distinguishable. Le Blon does not mention the proportions of the three colours necessary for producing black. Castel directs 15 parts of blue, five of red, and three of yellow; but takes notice, that these proportions are rather speculatively than practically just, and that the eye only can be the true judge; our colours all being very imperfect, and our pigments or other bodies of one denomination of colour being very unequal in their degree of intensity. He observes, that the pigments should all be of the deepest and darkest kind; and that, instead of taking one pigment for each colour, it is better to take as many as can be got; for the greater discord there is of heterogeneous and discordant drugs, the more true and beautiful, he says, will the black be, and the more capable of uniting with all other colours, without suppressing them, and even without making them tawny.

34
Black from a combination of other colours.

Dr Lewis acquaints us, that by mixing different blue, red, and yellow colours, he has not been able to produce a perfect black; but has often obtained from them very dark colours, such as may be called *brown-blacks*, or *gray-blacks*; such as we commonly see in the

dark

Colour-making.

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dark parts of paintings, and such as the charcoal and foot blacks appear when diluted a little. The ingredients being each of a dark deep colour is a very necessary condition; for bright blues, bright reds, and bright yellows, mixed in such proportions that neither colour prevailed, produced only a gray. In effect, all compositions of this kind, physically considered, can be no other than grays, or some of the intermediate tints between whiteness and darkness; and these grays will be so much the lighter or darker as the component colours of themselves are bright or dark.

With regard to the extraction of the colouring matter from the different kinds of vegetables commonly to be met with of all colours, this would certainly be a very valuable acquisition, could the colours so procured be made durable. On this subject nothing hath yet appeared more satisfactory than what is delivered by Dr Lewis in his notes on Neumann's chemistry. His observations are curious, but promise very little success to any who shall attempt to fix these vegetable colours.

35
Dr Lewis's
experiments on
vegetable
colours.

"Among the infinite variety of colours (says he), which glow in the flowers of plants, there are very few which have any durability, or whose fugitive beauty can be arrested by art, so as to be applied to any valuable purposes. The only permanent ones are the yellow, the red, the blue; and all the intermediate shades of purple, crimson, violet, &c. are extremely perishable. Many of these flowers lose their colours on being barely dried; especially if they are dried slowly, as has been usually directed, in a shady, and not warm place. The colours of all of them perish on keeping even in the closest vessels. The more hastily they are dried, and the more perfectly they are secured from the air, the longer they retain their beauty. The colouring matter extracted and applied on other bodies is still more perishable: oftentimes it is changed or destroyed in the hands of the operator.

"The colour of many blue flowers is extracted by infusion in water; but there are some from which water gains only reddish, or purplish blue. Of those that have been tried there is not one which gives any blue tincture to spirituous liquors: some give no colour at all, and some a reddish one. The juice pressed out from the fresh flowers is for the most part blue. The blue juices and infusions are changed red by all acids. The muriatic acid seems to strike the most florid red. The flowers themselves, macerated in acid liquors, impart also a deep red tincture. Alkalies, both fixed and volatile, and lime-water, change them to a green. Those infusions of the juices which have nothing of the native colour of the flowers, suffer the same changes from the addition of acid and alkaline liquors: even when the flowers have been kept till their colour is lost, infusions made from them acquire still a red colour from the one, and a green from the other, though in a less degree than when the flowers were fresh. The red colour produced by acids is scarcely more durable than the original blue: applied upon other bodies and exposed to the air, it gradually degenerates into a faintish purple, and at length disappears, leaving hardly any stain behind. The green produced by alkalies changes to a yellow, which does not fade so soon. The green, by lime-water, is more permanent

and more beautiful; green lakes, prepared from these flowers by lime-water, have been used as pigments by the painter. The flowers of cyanus have been greatly recommended, as affording elegant and durable blue pigments; but I have never been able to extract from them any blue colour at all. They retain their colour indeed, when hastily dried, longer than some other blue flowers; but they communicate nothing of it to any kind of menstruum. Infusions of them in watery, spirituous, and oily liquors, are all of them more or less of a reddish cast, without any tendency to blue. Alum, which is said to heighten and preserve their blue colour, changes it, like that of other blue flowers, to a purplish red; acids to a deep red; alkalies and lime-water to a green: solution of tin added to the watery infusion, turns it to a fine crimson; on standing, a beautiful red *fæcula* subsides, but it loses all its colour as soon as it is dry. The watery infusion, inspissated to the consistence of an extract, appears of a dark reddish brown: an extract made with rectified spirit is of a purplish colour. The colour of both extracts spread thin, and exposed to the air, quickly fades. The flowers employed in these experiments were those of the common blue-bottle of the corn-fields.

"Red flowers readily communicate their own red colour to watery menstrua; among those that have been tried, there is not one exception. Those of a full red colour give to rectified spirit also a deep red tincture, brighter, though somewhat paler, than the watery infusion: but the lighter red flowers, and those which have a tendency to purplish, impart very little colour to spirit, and seem to partake more of the nature of the blue flowers than of the pure red. Infusions of red flowers are supposed to be heightened by acids, and turned green by alkalies, like those of the blue; but this is far from being universal. Among those I have examined, the rose-colours and purplish reds were changed nearly in the same manner as the blues; but the full deep reds were not. The deep infusion of red poppies is changed by alkalies, not to a green, but to dusky purple.

"The colours of yellow flowers, whether pale or deep, are in general durable. Many of them are as much so, perhaps, as any of the native colours of vegetables. The colour is extracted both by water and by spirit. The watery infusions are the deepest. Neither alkalies nor acids alter the species of the colour, though both of them vary its shade; acids rendering it paler, and alkalies deeper; alum likewise considerably heightens it, though not so much as alkalies. An infusion of the flowers, made in alkaline ley, precipitated by alum, gives a durable yellow lake. In some of the deep reddish yellow, or orange-coloured flowers, the yellow matter seems to be of the same kind with that of the pure yellow flowers, but the red to be of a different kind from the pure red ones; watery menstrua take up only the yellow, and leave the red, which may afterwards be extracted by alcohol, or by water acuated by fixed alkaline salt. Such particularly are the saffron-coloured flowers of *carthamus*. These, after the yellow matter has been extracted by water, are said to give a red tincture to ley; from which, on standing at rest for some time, a deep bright red *fæcula* subsides; called from one of the

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names of the plant which produces it, *safflower*; and from the countries whence it is commonly brought to us, *Spanish-red*, and *China-lake*. This pigment impregnates alcohol with a beautiful red tincture, but communicates no colour to water. I have endeavoured to separate, by the same treatment, the red matter of some of the other reddish yellow flowers, as those of garden marigold, but without success. Plain water extracted a yellow colour, and alkaline ley extracted afterwards only a paler yellow: though the digestions were continued till the flowers had lost their colour, the tinctures were no other than yellow, and not so deep as those obtained from the pure yellow flowers. The little yellow flocculi, which in some kinds of flowers are collected into a compact round disc, as in the daisy and corn marigold, agree, so far as they have been examined, with the expanded yellow petala. Their colour is affected in the same manner by acids, by alkalies, and by alum; and equally extracted by water and by spirit. But the yellow farina, or fine dust, lodged on the tips of the stamina of flowers, appears to be of a different kind. It gives a fine bright yellow to spirit, and a duller yellow to water; the undissolved part proving in both cases of a pale yellowish white. Both the watery and spirituous tinctures were heightened by alkaline liquors, turned red by acids, and again to a deep yellow on adding more of the alkali: I know no other vegetable yellow that is turned red by acids.

"White flowers are by no means destitute of colouring matter. Alkaline lixivium extract from some of them a green tincture, and change their colourless expressed juices to the same colour; but I have not observed that they are turned red by acids. The flowers of the common wild convolvulus or bind-weed, which in all their parts are white, give a deep yellow or orange tincture to plain water; which, like the tinctures of flowers that are naturally of that colour, is rendered paler by acids, heightened a little by alum, and more considerably by alkaline salts. The vapours of the volatile sulphuric acid, or of burning sulphur, which whiten or destroy the colour of the coloured flowers, make no change in the white.

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Colours
from fruits.

"The red juices of fruits, as currants, mulberries, elder-berries, morello, black cherries, &c. gently inspissated to dryness, dissolve again almost totally in water, and appear nearly of the same red colour as at first. Rectified spirit extracts the tinging particles, leaving a considerable portion of mucilaginous matter undissolved; and hence the spirituous tincture proves of a brighter colour than the watery. The red solutions, and the juices themselves, are sometimes made dull, and sometimes more florid, by acids, and generally turned purplish by alkalies. The colours of these juices are for the most part perishable. They resist, indeed, the power of fermentation, and continue almost unchanged, after the liquor has been converted into wine; but when the juice is spread thin upon other bodies, exsiccated, and exposed to the air, the colour quickly alters and decays: the bright lively red changes the soonest: the dark dull red stain from the juice of the black cherry, is of considerable durability. The fruit of the American opuntia or prickly pear, the plant upon which the cochineal insect is produced, is perhaps an exception: This bright red fruit, ac-

ording to Labat, gives a beautiful red dye. Some experiments, however, made upon the juice of that fruit, as brought into England, did not promise to be of any great advantage; but the particulars I cannot now recollect.

"The ripe berries of buckthorn stain paper of a green colour. From these is prepared the substance called *sap-green*, a pigment sufficiently durable, readily soluble in water, but not miscible with oil. The berries dried while green, and macerated in alum-water, are said to yield a yellow pigment; and when they have grown over ripe so as to fall off spontaneously, a purple one. It is said that the berry of the *heliotropum tricoecum*, which grows wild about Montpellier, stains paper of a green colour, and that this green turns presently to a blue: that the common blue paper receives its colour from this juice: and that the red rags called *turnsol*, employed for colouring wines and other liquors, are tintured by the same juice turned red by acids. According to M. Niffole of the French academy of sciences (as quoted by Savary in his *Dictionnaire de Commerce*), the following juice is obtained, not from the berries, but from tops of the plant gathered in August, ground in mills, and then committed to the press. The juice is exposed to the sun about an hour, the rags dipt in it, dried in the sun, moistened by the vapour which arises during the flaking of quicklime with urine, then dried again in the sun, and dipped again in the juice. The Dutch and others are said to prepare turnsol rags, and turnsol in the mass, from different ingredients, among which archil is a principal one.

"In some plants, peony for instance, the seeds at a certain point of maturity are covered with a fine shining red membrane. The pellicles of the seeds of a certain American tree afford the red masses brought into Europe under the names of *annotto*, *orlean*, and *raucou**. Mr Pott, in the Berlin Memoirs for the year 1752, mentions a very extraordinary property of this concrete. 'With sulphuric acid it produces a blue colour, of extreme beauty; but with this capital defect, that all salts and liquors, and even common water, destroy it.' The specimen of annotto, which I examined, was not sensibly acted upon by sulphuric acid; it received no change in its own colour, and communicated none to the liquor. Nor did any visible change ensue upon dropping the acid into tinctures of annotto made in water, or in spirit. * See *Ann.*

"The green colour of the leaves of plants is extracted by rectified spirit of wine and by oils. The spirituous tinctures are generally of a fine deep green, even when the leaves themselves are dull-coloured, or yellowish, or hoary. The colour, however, seldom continues long even in the liquor; much less when the tinging matter is separated in a solid form, and exposed with a large surface to the air. The editor of the *Wirttemberg Pharmacopoeia* observes, that the leaves of *acanthus*, *brankursine*, or *bear's-breach*, give a more durable green tincture to spirit than those of any other herb. Alkalies heighten the colour both of the tinctures and green juices; acids weaken, destitute, or change it to a brownish: lime water improves both the colour and durability: by means of lime, not elegant green lakes are procurable from the leaves of *acanthus*, lily of the valley, and several other plants. There

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Colours
from
leaves.

Colour-making.

There are very few herbs which communicate any share of their green colour to water; perhaps none that give a green of any considerable deepness. It is said, however, that the leaves of some plants give a green dye to woollen, without the addition of any other colouring matter; particularly those of the wild chervil, or cow-weed, the common ragwort, and devil's-bit. The leaves of many kinds of herbs and trees give a yellow dye to wool or woollen cloth that has been previously boiled with a solution of alum and tartar. Weld, in particular, affords a fine yellow, and is commonly made use of for this purpose by the dyers, and cultivated in large quantity in some parts of England. There is no colour for which we have such plenty of materials as for yellow. M. Hellot observes that all leaves, barks, and roots, which on being chewed discover a slight astringency; as the leaves of the almond, peach, and pear trees, ash-bark, (especially that taken off after the first rising of the sap in the spring), the roots of wild patience, &c. yield durable yellows, more or less beautiful according to the length of time that the boiling is continued, and the proportions of alum and tartar in the preparatory liquor: that a large quantity of alum makes these yellows approach to the elegant yellow of weld: that if the tartar is made to prevail, it inclines them to an orange; that if the roots, barks, or leaves be too long boiled, the yellow proves tarnished, and acquires shades of brown." See the article DYEING.

* See Indigo and Woad.

Production of indigo accounted for.

The most capital preparations from the leaves of plants, are those of indigo, and weld; which are both very much used in dyeing, though the first only in painting*. Both the indigo and woad plants, give out their colour, by proper management, to water, in form of a blue fæcula or lake. M. Hellot suspects that a like blue fæcula is procurable from many other vegetables. Blue and yellow blended together, compose a green. He supposes the natural greens in vegetables to be compounded in like manner of these two colours; and that the blue is oftentimes the most permanent, so as to remain entire after the putrefaction or destruction of the yellow. The theory is specious, and perhaps just: we know of no other that accounts in any degree for the production of the indigo and woad blue. Dr Lewis, however, informs us, that he never was able to produce the least appearance of either blue or yellow from any of the plants he tried by treating them in the manner used for the preparation of indigo.

39 Colours from mosses.

There are sundry mosses, which in their natural state, like the indigo and woad plants, promise nothing of the elegant colours that can be extracted from them by art. The most remarkable of these is archil; for the preparation of which, and the colours that may be produced from it, see the article. Linnæus suspects that there are several other more common mosses from which valuable colours might be extracted: a quantity of sea-moss, having rotted in heaps on the shore, he observed the liquor in the heaps to be as red as blood; the sea-water, the sun, and the putrefaction, having brought out the colour. Mr Kalm, in an appendix to Linnæus's paper, in 1745, mentions two sorts of mosses actually employed in Sweden for dyeing woollen red: one is the lichenoides

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coralliforme apicibus coccineis of Ray's Synopsis; the other the lichenoides tartareum, farinaceum, scutellarum umbone fusco, of Dillenius. This last is a white substance like meal clotted together, found on the sides and tops of hills. It is shaved off from the rocks after rain, purified from the stony matters intermixed with it by washing with water, then dried in the sun, ground in mills, and again washed and dried: it is then put into a vessel with urine, and set by for a month: a little of this tincture added to boiling water makes the dyeing colour. In the same Transactions for the year 1754, there is an account of another moss which, prepared with urine, gives a beautiful and durable red or violet dye to wool and silk. This is the lichen foliaceus umbilicatus subtus lacunensis, Linn. flor. Suec. It grows upon rocks, and is readily distinguishable from others of that class, by looking as if burnt or parched, consisting of leaves as thin as paper, convex all over on the upper side, with corresponding cavities underneath, adhering firmly to the stones by a little root under the leaves, and coming asunder, when dry, as soon as touched. It is gathered after rain, as it then holds best together, and parts easiest from the stone. In France, a crustaceous moss, growing upon rocks in Auvergne, is prepared with lime and urine, and employed by the dyers as a succedaneum for the Canary archil, to which it is said to be very little inferior. M. Hellot relates, that he has met with several other mosses, which, on being prepared in the same manner, acquire the same colour. The most expeditious way, he says, of trying whether a moss will yield an archil or not, is to moisten a little of it with a mixture of equal parts of spirit of sal ammoniac and strong lime-water, and add a small proportion of crude sal ammoniac. The glass is then to be tied over with a piece of bladder, and set by for three or four days. If the moss is of the proper kind, the little liquor which runs from it upon inclining the vessel, will appear of a deep crimson colour; and this afterwards evaporating, the plant itself acquires the same colour. Dr Lewis informs us, that he has tried a good number of the common mosses, many both of the crustaceous and foliaceus kind, and not a few of the fungi; as also the herbs chamomile and milfoil, which yield a blue essential oil; and thyme, whose oil becomes blue by digestion with volatile spirits; but never met with any that yielded a colour like archil. Most of them gave a yellow or reddish brown tincture. A few gave a deep red colour to the liquor: but when diluted, it showed a yellowish cast, and when applied on cloth it gave only a yellowish-red.

To these observations we shall only add, that though in general, the blue colours of flowers are exceedingly perishable, there seem to be at least two exceptions to this rule; for the blue flowers of iris, or flower-de-luce, and those of columbine, when treated with solution of tin, yielded a colour tolerably permanent. Indeed, when experiments are made with a view to extract the colour from any part of a vegetable, it will always be proper to try whether it can bear a mixture with this solution. If the colour is not destroyed by it, there is a very great probability that the solution will, by proper management, preserve, and give a durability to it, which could scarce be obtained

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Some blue flowers may probably yield permanent colours.

by

Colouring
Colt.

by any other method. It must, however, be observed, that there are several substances used in colour-making, which solution of tin cannot bear to be mixed with. These are principally sugar of lead and cream of tartar, as well as all the calcareous earths and alkaline salts. With alum it may be mixed very safely, and is in many cases the better for it. The roots of plants, however, seem to promise more durability of colour than the upper parts. We have seen a blue colour of considerable durability and brightness prepared from the roots of common radishes by expressing the juice, combining it with tobacco-pipe clay, and brightening it with a little alum. The root of the red beet is also said to yield a durable colour of a beautiful red, inclining to scarlet; but this we cannot affirm from our own experience.

41
Colours
from roots.

42
Colours
for maps.

With regard to liquid colours for maps, &c. we apprehend there can be very little difficulty in preparing all the possible varieties of them, if what we have above laid down is attended to. The only colour with which there can be any difficulty is *blue*; but the common solution of indigo in alkalies or acids may be made to answer this purpose, though, on account of their strongly saline quality, they are not very proper. A very curious method of procuring a beautiful transparent blue colour is by extracting the colouring matter from Prussian blue, by means of a caustic alkali. This, when laid upon paper, appears of a dirty brown colour; but if washed over with a weak solution of green vitriol, is instantly changed to a most beautiful blue. This seems to afford a method of procuring blue transparent colours of greater beauty than they are usually met with.—See specimens of transparent colours prepared according to the above rules, on the *Chart* subjoined to HISTORY.

COLOURING, among painters, the manner of applying and conducting the colour of a picture; or the mixtures of light and shade, formed by the various colours employed in painting. See PAINTING.

COLOURING of Glass. See GLASS.

COLOURING of Porcelain. See PORCELAIN.

COLT, in *Zoology*, a general name for the young of the horse kind: the male being likewise, for distinction's sake, called a *horse-colt*; the female, a *filly*.

Sportsman's
Dictionary.

After the colts have been foaled, you may suffer them to run with the mare till about Michaelmas, sooner or later, according as the cold weather comes in; then they must be weaned; though some persons are for having them weaned after Martinmas, or the middle of November. The author of the *Complete Horseman* is of opinion, that the reason why most foals advance so slowly, and are not capable of service till they are six or seven years old, is because they have not sucked long enough; whereas, if they had sucked the whole winter over, they would be as good at four or five years old as they are now at eight.

They ought now to be kept in a convenient house, with a low rack and manger for their hay and oats, which must be sweet and good; with a little wheaten bran mixed with the oats to cause them to drink, and to keep their bodies open. But, since there are some who allege, that oats make foals become blind, or their teeth crooked; the same author is of opinion, that oats will wear their teeth, and make them the sooner to change, and also to raze; therefore he

judges it to be the best way to break them in a mill, because, that by endeavouring with their jaws to bruise and chew them, they stretch and swell their eye and nether-jaw veins, which so attract the blood and humours that they fall down upon the eyes, and frequently occasion the loss of them; so that it is not the heating quality of the oats, but the difficulty in chewing, that is the cause of their blindness.

Colt.

Further, colts thus fed with grain do not grow thickish upon their legs, but grow broader and better knit than if they had eaten nothing but hay and bran, and will endure fatigue the better. But above all, they must be kept from wet and cold, which are hurtful to them, nothing being more tender than they are. For proof of this, take a Spanish stallion, and let him cover two mares, which for age, beauty, and comeliness may admit of no difference between them; and if they produce both horse-colts, or both fillies, which is one and the same thing, let one run abroad, and the other be housed every winter, kept warm, and ordinarily attended; and that colt that has been kept abroad shall have large fleshy shoulders, flabby and gouty legs, weak pasterns, and ill hoofs; and shall be a dull heavy jade, in comparison to the other which is housed, and orderly kept; and which will have a fine forehead, be fine shaped, and have good legs and hoofs, and be of good strength and spirit; by which you may know, that to have the finest stallion, and the most beautiful mare, is nothing, if they are spoiled in the breeding up. It is worth observation, that some foals, under six months old, though their dams yield plenty of milk, yet decay daily, and have a cough, proceeding from certain pellicles or skins that breed in their stomachs, which obstruct their breathing, and at last destroy them entirely. To remedy this malady, take the bag wherein the colt was foaled, dry it, and give him as much of it in milk as you can take up with three fingers; but if you have not preserved the bag, procure the lungs of a young fox, and use it instead of the aforesaid powder.

It will be proper to let the colts play an hour or two in some court-yard, &c. when it is fair weather, provided you put them up again carefully, and see that they take no harm. When the winter is spent, turn them into some dry ground, where the grass is short and sweet, and where there is good water, that they may drink at pleasure; for it is not necessary that a colt should fill his belly immediately, like a horse that labours hard. The next winter you may take them into the house, and use them just as you do your other horses; but let not your horse-colts and fillies be kept together after the first year. This method may be observed every summer and winter till you break them, which you may do after they have been three years old; and it will be a very easy thing, if you observe the aforesaid method of housing them; for ordering them the second year as you do your other horses, they will be so tame and gentle, that you need not fear their leaping, plunging, kicking, or the like; for they will take the saddle quietly. As for all those ridiculous methods of beating and curbing them, they are in effect spoiling them, whatever they call it, in ploughed fields, deep ways, or the like; instead of which, let the rider strive to win them by gentle usage, never correcting them but when it is necessary,

Colt. necessary, and then with judgment and moderation. You will not need a cavesson of cord, which is a head strain, nor a pad of straw; but only a common saddle, and a common cavesson on his nose, such as other horses are ridden with; but it ought to be well lined with double leather; and, if you please, you may put on his mouth a watering bit, but without reins, only the head-stall, and this but for a few days; and then put on such a bit as he should be always ridden with; and be sure not to use spurs for some time after backing. Take notice, that as yearlings must be kept abroad together, so those of two years old together; and the like for those of three yearlings; which ordering is most agreeable to them.

In order to make him endure the saddle the better, the way to make it familiar to him will be by clapping the saddle with your hand as it stands upon his back, by striking it, and swaying upon it, dangling the stirrups by his sides, rubbing them against his sides, and making much of them, and bringing him to be familiar with all things about him; as straining the crupper, fastening and loosening the girths, and taking up and letting out the stirrups. Then, as to his motion, when he will trot with the saddle obediently, you may wash a trench of a full mouth, and put the same into his mouth, throwing the reins over the forepart of the saddle, so that he may have a full feeling of it; then put on a martingale, buckled at such a length that he may but just feel it when he jerks up his head; then take a broad piece of leather, and put it about his neck, and make the ends of it fast by plaiting it, or some other way, at the withers, and the middle part before his weasands, about two handfuls below the thropple, betwixt the leather and his neck; let the martingale pass so, that when at any time he offers to duck, or throw down his head, the cavesson being placed upon the tender gristle of his nose, may correct and punish him; which will make him bring his head to, and form him to an absolute rein; trot him abroad, and if you find the reins or martingale grow slack, straiten them, for when there is no feeling there is no virtue.

Colt-Evil, among farriers. See FARRIERY.

Colt-Taming, is the breaking of a colt so as to endure a rider. Colts are most easily broken at three or four years of age; but he who will have patience to see his horse at full five, will have him much more free of diseases and infirmities than if he was broken sooner.

Preparatory to their breaking for the saddle, they should be used to familiar actions, as rubbing, clawing, haltering, leading to water, taking up their feet, knocking their hoofs, &c. In order to bridle and saddle a colt, when he is made a little gentle, take a sweet watering trench, washed and anointed with honey and salt, which put into his mash, and so place it that it may hang about his tush; then offer him the saddle, but take care not to frighten him with it. Suffer him to smell at it, to be rubbed with it, and then to feel it; after that fix it, and gird it fast, and make that motion the most familiar to him to which he seems most averse. Being thus saddled and bridled, lead him out to water, and bring him in again; when he has stood reined upon the trench an hour or more, take off the bridle and saddle, and let him go to his

meat till the evening, and then lead him out as before; and when you carry him in again to set him up, take off his saddle gently, clothing him for the night.

COLTIE, a term used by timber-merchants, for a defect or blemish in some of the annular circles of a tree, whereby its value is much diminished.

COLUBER, in *Zoology*, a genus of serpent belonging to the order of amphibia. See ORHIOLOGY *Index*.

COLUMB-KILL. See JONA.

COLUMBA, the PIGEON, in *Ornithology*, a genus of birds belonging to the order of passeris. See ORNITHOLOGY *Index*.

COLUMBA, ST, in allusion to whose name the island of Jona (one of the Hebrides), received its name; *Jona* being derived from a Hebrew word signifying a dove. This holy man, infligated by his zeal, left his native country, Ireland, in the year 565, with the pious design of preaching the gospel to the Picts. It appears that he left his native soil with warm resentment, vowing never to make a settlement within sight of that hated island. He made his first trial at Oran-fay; and finding that place too near to Ireland, succeeded to his wish at *Hy*, for that was the name of Jona at the time of his arrival. He repeated here the experiment on several hills, erecting on each a heap of stones; and that which he last ascended is to this day called *Carnan-chul-reh-Eirium*, or "The eminence of the back turned to Ireland."

Columba was soon distinguished by the sanctity of his manners: a miracle that he wrought so operated on the Pictish king Bradeus, that he immediately made a present of the little isle to the saint. It seems that his majesty had refused Columba an audience; and even proceeded so far as to order the palace-gates to be shut against him: but the saint, by the power of his word, instantly caused them to fly open. As soon as he was in possession of Jona, he founded a cell of monks, borrowing his institutions from a certain oriental monastic order. It is said that the first religious were canons regular, of whom the founder was the first abbot; and that his monks, till the year 716, differed from those of the church of Rome, both in the observation of Easter and in the clerical tonsure. Columba led here an exemplary life, and was highly respected for the sanctity of his manners for a considerable number of years. He is the first on record who had the faculty of *second sight*, for he told the victory of Aidan over the Picts and Saxons on the very instant it happened. He had the honour of burying in his island, Convallius and Kinnatil, two kings of Scotland, and of crowning a third. At length, worn out with age, he died in Jona in the arms of his disciples; was interred there, but (as the Irish pretend) in after times translated to Down; where, according to the epitaph, his remains were deposited with those of St Bridget and St Patrick.

*Hi tres in Duno tumulo tumulantur in uno;
Brigida, Patricius, atque Columba pius.*

But this is totally denied by the Scots; who affirm, that the contrary is shown in a life of the saint, extracted out of the pope's library, and translated out of the Latin into Erse, by Father *Cailo baran*, which

Coltie
||
Columba.

Columbanus which decides in favour of Jona the momentous dispute.

||
Columbo-
root.

COLUMBANUS, a faint and a poet, was born in Ireland, and brought up to a religious life among the disciples of St Columba. He made uncommon progress in learning; and very early in life distinguished himself for poetical abilities, by the composition of a book of psalms, and a number of moral poems, intended also to be set to music. Jonas, a writer of ecclesiastical history, mentions, that Columbanus belonged originally to a monastery of the name of *Benchor*. The same monastery is mentioned by St Bernard in his life of his friend St Malachi; and he relates that it sent out a great number of monks, who spread over Europe. Columbanus passed from Britain into France, and founded the monastery of Luxeville near Besançon. He had been kindly received and patronized by King Childebert; but he was afterwards expelled out of France by the wicked queen Brunichild. He retired to Lombardy in Italy, and was well received by King Argulphus. In Lombardy he again founded the monastery of Bobio. The *Regula Cœnobialis* and *Penitentialis*, which he established in that monastery, have been published in the *Codex Regularum* compiled by the learned Holstenius. He was contemporary with St Benedict. It was in the year 589 he went into France.

COLUMBARIA, in *Ancient Geography*, an island like a rock on the west of Sicily, opposite to Drepanum; said by Zonares to have been taken from the Carthaginians by Numerius Fabius the consul. Now *Columbaria*, with a very strong and almost impregnable citadel (Cluverius).

COLUMBIC ACID. See CHEMISTRY *Index*.

COLUMBINE. See AQUILEGIA, BOTANY *Index*.

COLUMBIUM, a new metal which was discovered in a mineral from North America. See CHEMISTRY *Index*.

COLUMBO-ROOT, an article lately introduced into the materia medica, the natural history of which is not yet well known. According to Dr Percival's account, it grew originally on the continent of America, from whence it was transplanted to Columbo, a town in Ceylon, which gives name to, and supplies all India with it. The inhabitants of these countries have for a long time used it in disorders of the stomach and bowels. They carry it about with them, and take it sliced or scraped in Madeira wine. This root comes to us in circular pieces, which are from half an inch or an inch to three inches in diameter; and divided into *frusta*, which measure from two inches to one quarter of an inch. The sides are covered with a thick corrugated bark, of a dark brown hue on its external surface, but internally of a light yellow colour. The surfaces of the transverse sections appear very unequal, highest at the edges, and forming a concavity towards the centre. On separating this surface, the root is observed to consist of three lamina, viz. the cortical, which in the larger roots, is a quarter of an inch thick; the ligneous, about half an inch; and the medullary, which forms the centre, and is near an inch in diameter. This last is much softer than the other parts, and, when chewed, seems mucilaginous; a number of small fibres run longitudinally through it, and

appear on the surface. The cortical and ligneous parts are divided by a black circular line. All the thicker pieces have small holes drilled through them, for the convenience of drying. Columbo-root has an aromatic smell, but is disagreeably bitter, and slightly pungent to the taste, somewhat resembling mustard-seed, when it has lost, by long keeping, part of its essential oil. Yet, though ungrateful to the taste, when received into the stomach, it appears to be corroborant, antiseptic, sedative, and powerfully antiemetic. In the cholera morbus it alleviates the violent *tormina*, checks the purging and vomiting, corrects the putrid tendency of the bile, quiets the inordinate motions of the bowels, and speedily recruits the exhausted strength of the patient. It was administered to a great number of patients, sometimes upwards of 20 in a day, afflicted with the cholera morbus, by Mr Johnson of Cheshire, in 1756. He generally found that it soon stopped the vomiting, which was the most fatal symptom, and that the purging and remaining complaints quickly yielded to the same remedy. The dose he gave was from half a drachm to two drachms of the powder, every three or four hours, more or less according to the urgency of the symptoms. Though this medicine possesses little or no astringency, it has been observed to be of great service in diarrhœas, and even in the dysentery. In the first stage of these disorders, where astringents would be hurtful, Columbo-root may be prescribed with safety; as, by its antispasmodic powers, the irregular actions of the primæ viæ are corrected. But as a cordial, tonic, and antiseptic remedy, it answers better when given towards their decline. Its efficacy has also been observed in the vomitings which attend the bilious cholic; and in such cases, where an emetic is thought necessary, after administering a small dose of ipecacuan, the stomach may be washed with an infusion of Columbo-root. This will tend to prevent those violent and convulsive retchings which in irritable habits abounding with bile are sometimes excited by the mildest emetic. In bilious fevers, 15 or 20 grains of this root, with an equal or double quantity of vitriolated tartar, given every four, five, or six hours, produce very beneficial effects. From its efficacy in these bilious diseases of this country, it is probable that it may be useful in the yellow fever of the West Indies, which is always attended with great sickness, violent retchings, and a copious discharge of bile. The vomiting recurs at short intervals, often becomes almost incessant, and an incredible quantity of bile is sometimes evacuated in a few hours. Children during dentition are often subject to severe vomitings and diarrhœas. In these cases the Columbo-root is an useful remedy, and hath often procured almost instant relief, when other remedies often efficacious have been tried in vain. This root is also extremely beneficial in a languid state of the stomach, attended with want of appetite, indigestion, nausea, and flatulence. It may be given either in substance, with some grateful aromatic, or infused in Madeira wine. Habitual vomiting, when it proceeds from a weakness or irritability of the stomach, from an irregular gout, acidities, acrimonious bile, or an increased and depraved secretion of the pancreatic juice, is greatly relieved by the use of Columbo-root, in conjunction with aromatics, chalybeates, or the testaceous powders. In the nausea and vomiting

Columbo-
root.

Columbo-root vomiting occasioned by pregnancy, an infusion of Columbo-root succeeds better than any other medicine that hath been tried.

From Dr Percival's experiments on this root, it appears, that rectified spirit of wine extracts its virtues in the greatest perfection. The watery infusion is more perishable than that of other bitters. In 24 hours a copious precipitation takes place; and in two days it becomes ropy, and even musty. The addition of orange peel renders the infusion of Columbo-root less ungrateful to the palate. An ounce of the powdered root, half an ounce of orange-peel, two ounces of French brandy, and 14 ounces of water, macerated 12 hours without heat, and then filtered through paper, afford a sufficiently strong and tolerably pleasant infusion. The extract made first by spirit and then with water, and reduced by evaporation to a pilular consistence, is found to be equal, if not superior, in efficacy to the powder. As an antiseptic, Columbo-root is inferior to the bark; but as a corrector of putrid gall, it is much superior; whence also it is probable that it would be of service in the West India yellow fever. It also restrains alimentary fermentation, without impairing digestion, in which property it resembles mustard. Hence its great service in preventing acidities. It hath also a remarkable power of neutralizing acids already formed. It doth not appear to have the least heating quality; and therefore may be used with propriety and advantage in the phthisis pulmonalis and in hectic cases, to correct acrimony and strengthen digestion. It occasions no disturbance, and agrees very well with a milk diet, as it abates flatulence, and is indisposed to acidity.

COLUMBO, a maritime town of the island of Ceylon in the East Indies, seated on the south-west part of its coast, and subject to the Dutch. E. Long. 68. 10. N. Lat. 7. 5.

COLUMBUS, or *Congregation of St COLUMBUS*, a society of regular canons, who formerly had 100 abbey or monasteries in the British isles.

COLUMBUS, *Christopher*, a Genoese, the celebrated navigator, and first discoverer of the islands of America, was a subject of the republic of Genoa. Neither the time nor the place of his birth, however, are known with certainty; only he was descended of an honourable family, who, by various misfortunes, had been reduced to indigence. His parents were seafaring people; and Columbus having discovered, in his early youth, a capacity and inclination for that way of life, was encouraged by them to follow the same profession. He went to sea at the age of 14: his first voyages were to those ports in the Mediterranean frequented by the Genoese, after which he took a voyage to Iceland; and proceeding still further north, advanced several degrees within the polar circle. After this, Columbus entered into the service of a famous sea captain of his own name and family. This man commanded a small squadron, fitted out at his own expence; and by cruising, sometimes against the Mahometans, and sometimes against the Venetians, the rivals of his country in trade, had acquired both wealth and reputation. With him Columbus continued for several years, no less distinguished for his courage than his experience as a sailor. At length, in an obstinate engagement off the coast of Portugal,

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with some Venetian caravals returning richly laden from the Low Countries, the vessel on board which he served took fire, together with one of the enemies ships to which it was fast grappled. Columbus threw himself into the sea, laid hold of a floating oar, and by the support of it, and his dexterity in swimming, he reached the shore, though above two leagues distant.

After this disaster, Columbus repaired to Lisbon, where he married a daughter of Bartholomew Perestrello, one of the captains employed by Prince Henry in his early navigations, and who had discovered and planted the islands of Porto Santo and Madeira. Having got possession of the journals and charts of this experienced navigator, Columbus was seized with an irresistible desire of visiting unknown countries. In order to indulge it, he made a voyage to Madeira, and continued during several years to trade with that island, the Canaries, Azores, the settlements in Guinea, and all the other places which the Portuguese had discovered on the continent of Africa.

By the experience acquired in such a number of voyages, Columbus now became one of the most skilful navigators in Europe. At this time the great object of discovery was a passage by sea to the East Indies. This was attempted, and at last accomplished, by the Portuguese, by doubling the Cape of Good Hope. The danger and tediousness of the passage, however, supposing it to be really accomplished, which as yet it was not, set Columbus on considering whether a shorter and more direct passage to these regions might not be found out; and, after long consideration, he became thoroughly convinced, that, by sailing across the Atlantic ocean, directly towards the west, new countries, which probably formed a part of the vast continent of India, must infallibly be discovered. His reasons for this were, in the first place, a knowledge he had acquired of the true figure of the earth. The continents of Europe, Asia, and Africa, as far as then known, form but a small part of the globe. It was suitable to our ideas, concerning the wisdom and beneficence of the Author of nature, to believe, that the vast space, still unexplored, was not entirely covered by a waste and barren ocean, but occupied by countries fit for the habitation of man. It appeared likewise extremely probable, that the continent on this side the globe was balanced by a proportional quantity of land in the other hemisphere. These conjectures were confirmed by the observations of modern navigators. A Portuguese pilot having stretched farther to the west than was usual at that time, took up a piece of timber, artificially carved, floating upon the sea; and as it was driven towards him by a westerly wind, he concluded that it came from some unknown land situated in that quarter. Columbus's brother-in-law had found to the west of the Madeira isles a piece of timber fashioned in the same manner, and brought by the same wind; and had seen also canes of an enormous size floating upon the waves, which resembled those described by Ptolemy, as productions peculiar to the East Indies. After a course of westerly winds, trees torn up by the roots were often driven upon the coast of the Azores; and at one time the dead bodies of two men, with singular features, which resembled neither the inhabitants of Europe nor Africa, were cast ashore there. The most

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Columbus cogent reason, however, was a mistaken notion of the ancient geographers concerning the immense extent of the continent of India. Though hardly any of them had penetrated beyond the river Ganges, some Greek writers had ventured to describe the provinces beyond that river, which they represented as regions of an immense extent. Ctesias affirmed that India was as large as all the rest of Asia. Onesicritus, whom Pliny the naturalist follows, contended that it was equal to a third part of the habitable earth. Nearchus asserted that it would take four months to march from one extremity of it to the other in a straight line. The journal of Marco Polo, who travelled into Asia in the 13th century, and who had proceeded towards the east far beyond the limits to which any European had ever advanced, seemed also so much to confirm these accounts, that Columbus was persuaded that the distance from the most westerly part of Europe to the most easterly part of Asia was not very considerable; and that the shortest, as well as most direct course to the remote regions of the east, was to be found by sailing due west.

In 1474, Columbus communicated his ideas on this subject to one Paul a physician in Florence, a man eminent for his knowledge in cosmography. He approved of the plan, suggested several facts in confirmation of it, and warmly encouraged Columbus to persevere in an undertaking so laudable, and which must redound so much to the honour of his country and the benefit of Europe. Columbus, fully satisfied of the truth of his system, was impatient to set out on a voyage of discovery. The first step towards this was to secure the patronage of some of the considerable powers of Europe capable of undertaking such an enterprise. He applied first to the republic of Genoa; but his countrymen, strangers to his abilities, inconsiderately rejected his proposal as the dream of a chimerical projector, and thus lost for ever the opportunity of restoring their commonwealth to its ancient lustre. His next application was to the court of Portugal, where King John II. listened to him in the most gracious manner, and referred the consideration of his plan to Diego Ortiz, bishop of Ceuta, and two Jewish physicians, eminent cosmographers, whom he was accustomed to consult in matters of this kind. Unhappily these were the persons who had been the chief directors of the Portuguese navigations, and had advised to search for a passage to India by steering a course directly opposite to that which Columbus had recommended as shorter and more certain. They could not therefore approve of his proposal, without submitting to the double mortification of condemning their own theory, and of acknowledging his superiority. The result of their conferences was, that they advised the king to fit out a vessel privately, in order to attempt the proposed discovery, by following exactly the course which Columbus seemed to point out. John forgetting on this occasion the sentiments of a monarch, meanly adopted this perfidious counsel. But the pilot chosen to execute Columbus's plan had neither the genius nor fortitude of its author. Contrary winds arose; no sign of approaching land appeared; his courage failed; and he returned to Lisbon, execrating the project as equally extravagant and dangerous.

On discovering this dishonourable transaction, Columbus immediately quitted Portugal, and applied to the king of Spain; but lest he should be here again disappointed, he sent his brother Bartholomew into England, to whom he had fully communicated his ideas, in order that he might negotiate at the same time with Henry VII. who was reckoned one of the most sagacious as well as opulent princes of Europe. Bartholomew was very unfortunate in his voyage: he fell into the hands of pirates, who stripped him of every thing, and detained him a prisoner for several years. At last he made his escape, and arrived in London, but in such extreme indigence that he was obliged to employ himself, during a considerable time, in drawing and selling maps, in order to pick up as much money as would purchase a decent dress in which he might venture to appear at court. The proposals were received by Henry with more approbation than by any monarch to whom they had hitherto been presented.

Columbus himself made his proposals to the king of Spain, not without many doubts of success, which soon appeared to be well founded. True science had as yet made so little progress in the kingdom of Spain, that most of those to whom the consideration of his plan was referred were utterly ignorant of the first principles on which he founded his hopes. Some, from mistaken notions concerning the dimensions of the globe, contended that a voyage to those remote regions of the East, which Columbus expected to discover, could not be performed in less than three years. Others concluded, that either he would find the ocean of infinite extent, according to the opinion of some ancient philosophers; or that if he should persist in steering westwards beyond a certain point, the convex figure of the globe must infallibly prevent his return, and he must perish in the vain attempt to unite the two opposite hemispheres, which nature had forever disjoined. Even without deigning to enter into any particular discussion, some rejected the scheme in general, upon the credit of a maxim made use of by the ignorant in all ages, "That it is presumptuous in any person to suppose that he alone possesses knowledge superior to all the rest of mankind united." By continual disappointments and delays, he was at last wearied out, and resolved to repair to the court of England in person, in hopes of meeting with a favourable reception there. He had already made preparations for this purpose, and taken measures for the disposal of his children during his absence, when Juan Perez, the prior of the monastery of Rabida near Palos, in which they had been educated, earnestly solicited him to defer his journey for a short time. Perez was a man of considerable learning, and some credit with Queen Isabella. To her therefore he applied; and the consequence of his application was a gracious invitation of Columbus back to court, accompanied with the present of a small sum to equip him for the journey. Ferdinand, however, still regarded the project as chimerical; and had the address to employ, in this new negotiation with him, some of the persons who had formerly pronounced his scheme to be impracticable. To their astonishment, Columbus appeared before them with the same confident hopes of success as formerly, and insisted

Columbus insisted on the same high recompense. He proposed that a small fleet should be fitted out, under his command, to attempt the discovery; and demanded to be appointed perpetual and hereditary admiral and viceroy of all the seas and lands which he should discover; and to have the tenth of the profits arising from them settled irrevocably upon him and his descendants for ever. At the same time he offered to advance the eighth part of the sum necessary for accomplishing his design, on condition that he should be entitled to a proportional share in the adventure. If the enterprise should totally miscarry, he made no stipulation for any reward or emolument whatever. These demands were thought unreasonable; Isabella broke off the treaty she had begun, and Columbus was once more disappointed. He now resolved finally to leave Spain; and had actually proceeded some leagues on his journey, when he was overtaken by a messenger from Isabella, who had been prevailed upon by the arguments of Quintanilla and Santangel, two of Columbus's patrons, again to favour his undertakings. The negotiation now went forward with all manner of facility and dispatch; and a treaty with Columbus was signed on the 17th of April 1492. The chief articles of it were, that Columbus should be constituted high admiral in all the seas, islands, and continents he should discover, with the same powers and prerogatives that belonged to the high admiral of Castile within the limits of his jurisdiction. He was also appointed viceroy in all those countries to be discovered; and a tenth of the products accruing from their productions and commerce was granted to him for ever. All controversies or law-suits with respect to mercantile transactions were to be determined by the sole authority of Columbus, or of judges to be appointed by him. He was also permitted to advance one eighth part of the expence of the expedition, and of carrying on commerce with the new countries; and was entitled, in return, to an eighth part of the profit. But though the name of Ferdinand was joined with Isabella in this transaction, his distrust of Columbus was still so violent, that he refused to take any part in the enterprise as king of Arragon; and as the whole expence of the expedition was to be defrayed by the crown of Castile, Isabella reserved for her subjects of that kingdom an exclusive right to all the benefits which might accrue from its success.

At last our adventurer set sail with three small ships, the whole expence of which did not exceed 4000l. During his voyage he met with many difficulties from the mutinous and timid disposition of his men. He was the first who observed the variation of the compass, which threw the sailors into the utmost terror. For this phenomenon Columbus was obliged to invent a reason, which, though it did not satisfy himself, yet served to dispel their fears, or silence their murmurs. At last, however, the sailors lost all patience; and the admiral was obliged to promise solemnly, that in case land was not discovered in three days he should return to Europe. That very night, however, the island of San Salvador was discovered, which quickly put an end to all their fears. The sailors were then as extravagant in the praise of Columbus as they had before been insolent in reviling and threatening him. They threw themselves at his feet, implored his pardon,

and pronounced him to be a person inspired by heaven with more than human sagacity and fortitude, in order to accomplish a design so far beyond the ideas and conception of all former ages. Having visited several of the West India islands, and settled a colony in Hispaniola*, he again set sail for Spain; and after escaping great dangers from violent tempests, arrived at the port of Palos on the 15th of March 1493. * See Hispaniola.

As soon as Columbus's ship was discovered approaching, all the inhabitants of Palos ran eagerly to the shore, where they received the admiral with royal honours. The court was then at Barcelona, and Columbus took care immediately to acquaint the king and queen of his arrival. They were no less delighted than astonished with this unexpected event. They gave orders for conducting him into the city with all imaginable pomp. They received him clad in their royal robes, and seated on a throne under a magnificent canopy. When he approached, they stood up; and, raising him as he kneeled to kiss their hands, commanded him to take his seat upon a chair prepared for him, and to give a circumstantial account of his voyage. When he had finished his oration, which he delivered with much modesty and simplicity, the king and queen, kneeling down, offered up solemn thanks to God for the discovery. Every possible mark of honour that could be suggested by gratitude or admiration was conferred on Columbus; the former capitulation was confirmed, his family was ennobled, and a fleet was ordered to be equipped, to enable him to go in quest of those more opulent countries which he still confidently expected to find.

Notwithstanding all this respect, however, Columbus was no longer regarded than he was successful. The colonists he carried over with him were to the last degree unreasonable and unmanageable; so that he was obliged to use some severities with them; and complaints were made to the court of Spain against him for cruelty. On this, Francis de Bovadilla, a knight of Calatrava, was appointed to inquire into the conduct of Columbus; with orders, in case he found the charge of maladministration proved, to supersede him, and assume the office of governor of Hispaniola. The consequence of this was, that Columbus was sent to Spain in chains. From these, however, he was freed immediately on his arrival, and had an opportunity granted him of vindicating his innocence. He was, however, deprived of all power; and notwithstanding his great services, and the solemnity of the agreement between him and Ferdinand, Columbus never could obtain the fulfilment of any part of that treaty. At last, disgusted with the ingratitude of a monarch whom he had served with such fidelity and success, and exhausted with fatigues, he ended his life on the 29th of May 1506.

COLUMBUS, *Bartolomeu*, brother to Christopher, famous for his marine charts and spheres, which he presented to Henry VII. of England. He died in 1514.

COLUMBUS, *Don Ferdinand*, son of Christopher, and writer of his life. He entered into the ecclesiastical state; and founded a library, which he bequeathed to the church of Seville, to this day called the *Columbine library*. He died in 1560.

COLUMELLA, LUCIUS JUNIUS MODERATUS, a Roman

Columey,
Column.

Roman philosopher, was a native of Cadiz, and lived under the emperor Claudius, about the year 42. He wrote a book on agriculture entitled *De Re Rustica*, and another *De Arboribus*.

COLUMEY, a town of Red Russia in Poland, seated on the river Pruth, towards the confines of Moldavia, about 38 miles from Halicz, and 63 south of Leopold. This town has been very ill treated by the Cossacks, inasmuch that it is now inconsiderable, though there are several mines of salt in its district. E. Long. 16. 25. N. Lat. 48. 45.

COLUMN, in *Architecture*, a round pillar made to support and adorn a building, and composed of a base, a shaft, and capital. See **ARCHITECTURE**, N^o 33.

COLUMNS, *denominated from their use*.—Astronomical column is a kind of observatory, in form of a very high tower built hollow, and with a spiral ascent to an armillary sphere placed a-top for observing the motions of the heavenly bodies. Such is that of the Doric order erected at the Hotel de Soissons at Paris, by Catharine de Medicis, for the observations of Orontius Fineus, a celebrated astronomer of that time.

Chronological COLUMN, that which bears some historical inscription digested according to the order of time; as by lustres, olympiads, fasti, epochas, annals, &c. At Athens, there were columns of this kind, whereon was inscribed the whole history of Greece digested into olympiads.

Funeral COLUMN, that which bears an urn, wherein are supposed to be enclosed the ashes of some deceased hero; and whose shaft is sometimes overspread with tears and flames, which are symbols of grief and of immortality.

Gnomonic COLUMN, a cylinder whereon the hour of the day is represented by the shadow of a stile. See **DIAL**.

Historical COLUMN, is that whose shaft is adorned with a basso-relievo, running in a spiral line its whole length, and containing the history of some great personage: such are the Trajan and Antonine columns at Rome.

Hollow COLUMN, that which has a spiral staircase within for the convenience of ascending to the top; as the Trajan column, the staircase whereof consists of 185 steps, and is illuminated by 43 little windows, each of which is divided by tambours of white marble. The monument, or fire-column, at London, has also a staircase; but it does not reach to the top. These kinds of columns are also called *columnæ coelidæ*, or *cochlidæ*.

Indicative COLUMN, that which serves to show the tides, &c. along the sea-coasts. Of this kind there is one at Grand Cairo of marble, on which the overflowings of the Nile are expressed; by this they form a judgment of the succeeding seasons; when the water, for instance, ascends to 23 feet, it is a sign of great fertility in Egypt. See **NILOMETER**.

Instructive COLUMN, that raised, according to Josephus, lib. i. cap. 3. by the sons of Adam, whereon were engraven the principles of arts and sciences. Baudelot tells us, that the son of Pisistratus raised another of this kind, of stone, containing the rules and precepts of agriculture.

Lininary COLUMN, a column with several faces, pla-

ced in the cross ways in large roads; serving to show the different routes by inscriptions thereon.

Lactary COLUMN, at Rome, according to Festus, was a column erected in the herb-market, now the place *Montanara*, which had a cavity in its pedestal, wherein young children abandoned by their parents, out of poverty or inhumanity, were exposed, to be brought up at the public expence.

Legal COLUMN. Among the Lacedæmonians there were columns raised in public places, whereon were engraven the fundamental laws of the state.

Limitrophous or *Boundary COLUMN*, that which shows the limits of a kingdom or country conquered. Such was that which Pliny says Alexander the Great erected at the extremity of the Indies.

Manubary COLUMN, from the Latin *manubiæ*, "spoils of the enemy;" a column adorned with trophies built in imitation of trees, whereon the spoils of enemies were anciently hung. See **TROPHY**.

Memorial COLUMN, that raised on occasion of any remarkable event, as the monument of London, built to perpetuate the memory of the burning of that city in 1666. It is of the Doric order, fluted, hollow, with a winding-staircase; and terminated a-top with waving flames. There is also another of the kind, in form of an obelisk, on the banks of the Rhine in the Palatinate, in memory of the famous passage of that river by the great Gustavus Adolphus and his army.

Menian COLUMN, any column which supports a balcony or meniana. The origin of this kind of column, Suetonius and Afcanius refer to one Menias; who having sold his house to Cato and Flaccus, consuls, to be converted into a public edifice, reserved to himself the right of raising a column withoutside, to bear a balcony, whence he might see the shows.

Military COLUMN, among the Romans, a column whereon was engraven a list of the forces in the Roman army, ranged by legions, in their proper order; with design to preserve the memory of the number of soldiers, and of the order preserved in any military expedition. They had another kind of military column, which they called *columna bellica*, standing before the temple of Janus; at the foot whereof the consul declared war, by throwing a javelin towards the enemies countries.

Milliary COLUMN, was a column of marble raised by order of Augustus in the middle of the Roman forum; from whence, as a centre, the distances of the several cities, &c. of the empire were reckoned, by other milliary columns disposed at equal distances on all the grand roads. This column was of white marble, the same with that which is now seen on the balustrade of the perron of the capitol at Rome. Its proportion is massive, being a short cylinder, the symbol of the globe of the earth. It was called *milliarium aureum*, as having been gilt, at least the ball, by order of Augustus. It was restored by the emperors Vespasian and Adrian, as appears by the inscriptions.

Sepulchral COLUMN, anciently was a column erected on a tomb or sepulchre, with an inscription on its base. Those over the tombs of persons of distinction were very large; those for the common people small: these last are called *stelæ* and *cippi*.

Statuary COLUMN, that which supports a statue. Such was that erected by Pope Paul V. on a pedestal before the

Column.

Column
||
Colyba.

the church of St Maria at Rome; to support a statue of the Virgin, which is of gilt brass. This column was dug up in the temple of Peace; its shaft is a single block of white marble $49\frac{1}{2}$ feet high, and five feet eight inches diameter, of the Corinthian order.

The term *statuary column* may likewise be applied to Caryatides, Persians, termini, and other human figures, which do the office of columns; and which Vitruvius calls *telomones* and *atlantes*. See ARCHITECTURE, N^o 54.

Triumphal COLUMN, a column erected among the ancients in honour of a hero; the joints of the stones, or courses whereof, were covered with as many crowns as he had made different military expeditions. Each crown had its particular name, as *vallar*, which was beset with spikes, in memory of having forced a palisade. *Muralis*, adorned with little turrets, or battlements, for having mounted an assault. *Navalis*, of prows and beaks of vessels; for having overcome at sea. *Obsidionalis*, or *graminalis*, of grass; for having raised a siege. *Ovans*, of myrtle; which expressed an ovation, or little triumph; and *triumphalis*, of laurel, for a grand triumph. See CROWN.

COLUMNARIUM, in Roman antiquity, a heavy tribute, demanded for every pillar of a house. It was first laid on by Julius Cæsar, in order to put a stop to the extravagant expences laid out on sumptuous buildings.

COLUMNÆA. See BOTANY Index.

COLUMNIFERI, in Botany, an order of plants in the *fragmenta methodi naturalis* of Linnæus. See BOTANY Index.

COLURES, in Astronomy and Geography, two great circles supposed to intersect each other at right angles in the poles of the world, and to pass through the solstitial and equinoctial points of the ecliptic. See GEOGRAPHY.

COLURI, a little island in the gulf of Engia, in the Archipelago, formerly called *Salamis*. The principal town is of the same name, and seated on the south side, at the bottom of the harbour, which is one of the finest in the world. The famous Grecian hero, Ajax, who makes such a figure in Homer's Iliad, was king of this island. It is now, however, but a poor place; its commodities consist of wheat, barley, tar, rosin, pit-coal, sponges, and pot-ashes, which they carry to Athens. It is seven miles south from Athens, and is separated from the continent by a strait about a mile over.

COLUTEA, BASTARD-SENA. See BOTANY Index.

COLYBA, or *COLYBUS*; a term in the Greek liturgy, signifying an offering of corn and boiled pulse, made in honour of the saints, and for the sake of the dead.

Balsamon, P. Goar, Leo Allatius, and others, have written on the subject of *colyba*; the substance of what they have said is as follows: The Greeks boil a quantity of wheat, and lay it in little heaps on a plate; adding beaten peas, nuts cut small, and grape-stones, which they divide into several compartments, separated from each other by leaves of parsley. A little heap of wheat, thus seasoned, they call *κολυβα*. They have a particular formula for the benediction of the *colyba*, wherein, praying that the children of Babylon may be fed with pulse, and that they may be in better

condition than other people, they desire God to bless those fruits, and those who eat them, because offered to his glory, to the honour of such a saint, and in memory of the faithful deceased. Balsamon refers the institution of this ceremony to St Athanasius; but the Greek Synaxary to the time of Julian the apostate.

COLYMBUS, a genus of birds belonging to the order of anseres. See ORNITHOLOGY Index.

COM, a town of Asia in the empire of Persia, and province of Irac-agemi. It is a large populous place, but has suffered greatly by the civil wars. E. Long. 51. 56. N. Lat. 34. 5.

COMA, or *COMA-VIGIL*, a preternatural propensity to sleep, when, nevertheless, the patient does not sleep, or if he does, awakes immediately without any relief. See MEDICINE Index.

COMA Berenices, Berenice's hair, in Astronomy, a modern constellation of the northern hemisphere, composed of unformed stars between the Lion's tail and Boötes. This constellation is said to have been formed by Conon, an astronomer, in order to console the queen of Ptolemy Euergetes for the loss of a lock of her hair, which was stolen out of the temple of Venus, where she had dedicated it on account of a victory obtained by her husband. The stars of this constellation, in Tycho's Catalogue, are fourteen; in Hevelius's, twenty-one; and in the Britannic Catalogue, forty-three.

COMA Somnolentum, is when the patient continues in a profound sleep; and, when awakened, immediately relapses, without being able to keep open his eyes.

COMARUM, MARSH-CINQUEFOIL. See BOTANY Index.

COMB, an instrument to clean, untangle, and dress flax, wool, hair, &c.

Combs for wool are prohibited to be imported into England.

COMB is also the crest, or red fleshy tuft, growing upon a cock's head.

COMBAT, in a general sense, denotes an engagement, or a difference decided by arms. See BATTLE.

COMBAT, in our ancient law, was a formal trial of some doubtful cause or quarrel, by the swords or bastons of two champions. This form of proceeding was very frequent, not only in criminal but in civil causes; being built on a supposition that God would never grant the victory but to him who had the best right. The last trial of this kind in England was between Donald Lord Reay appellant, and David Ramsay, Esq. defendant, when, after many formalities, the matter was referred to the king's pleasure. See the article BATTLE.

COMBINATION, properly denotes an assemblage of several things, two by two.

COMBINATION, in Mathematics, is the variation or alteration of any number of quantities, letters, or the like, in all the different manners possible. See CHANGES.

Aphorisms. I. In all combinations, if from an arithmetic decreasing series, whose first term is the number out of which the combinations are to be formed, and whose common difference is 1, there be taken as many terms as there are quantities to be combined, and these

Colymbus
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terms be multiplied into each other; and if from the series 1, 2, 3, 4, &c. there may be taken the same number of terms, and they be multiplied into each other, and the first product be divided by the second; the quotient will be the number of combinations required. Therefore, if you would know how many ways four quantities can be combined in seven, multiply the first four terms of the series, 7, 6, 5, 4, &c. together, and divide the product, which will be 840, by the product of the first four terms of the series, 1, 2, 3, 4, &c. which is 24, and the quotient 35 will be the combinations of 4 in 7. II. In all permutations, if the series 1, 2, 3, 4, &c. be continued to as many terms as there are quantities to be changed, and those terms be multiplied into each other; the product will be the number of permutations fought. Thus, if you would know how many permutations can be formed with five quantities, multiply the terms 1, 2, 3, 4, 5, together, and the product 120 will be the number of all the permutations.

Problems. I. To find the number of changes that may be rung on 12 bells. It appears by the second aphorism, that nothing more is necessary here than to multiply the numbers from 1 to 12 continually into each other, in the following manner, and the last product will be the number fought.

1
2
2
3
6
4
24
5
120
6
720
7
5040
8
40320
9
362880
10
3628800
11
39916800
12
479,001,600

II. Suppose the letters of the alphabet to be wrote so small that no one of them shall take up more space than the hundredth part of a square inch: to find how many square yards it would require to write all the permutations of the 24 letters in that size. By following the same method as in the last problem, the number of permutations of the 24 letters will be found to be 62,044,840,173,323,943,936,000. Now the inches in a square yard being 1296, that number multiplied by 100 gives 129,600, which is the number of letters each square yard will contain; therefore if we divide 62,044,840,173,323,943,936,000 by 129600,

I

the quotient, which is 478,741,050,720,092,160, will be the number of yards required, to contain the above-mentioned number of permutations. But as all the 24 letters are contained in every permutation, it will require a space 24 times as large; that is, 11,489,785,217,282,211,840. Now the number of square yards contained on the surface of the whole earth is but 617,197,435,008,000, therefore it would require a surface 18620 times as large as that of the earth to write all the permutations of the 24 letters in the size above mentioned.

III. To find how many different ways the eldest hand at piquet may take in his five cards. The eldest hand having 12 cards dealt him, there remain 20 cards, any five of which may be in those he takes in; consequently we are here to find how many ways five cards may be taken out of 20. Therefore, by aphorism I. if we multiply 20, 19, 18, 17, 16, into each other, which will make 1860480, and that number be divided by 1, 2, 3, 4, 5, multiplied into each other, which make 120, the quotient, which is 15504, will be the number of ways five cards may be taken out of 20. From hence it follows, that it is 15503 to 1, that the eldest hand does not take in any five certain cards.

IV. To find the number of deals a person may play at the game of whist, without ever holding the same cards twice. The number of cards played with at whist being 52, and the number dealt to each person being 13, it follows, that by taking the same method as in the last experiment, that is, by multiplying 52 by 51, 50, &c. so on to 41, which will make 3,954,242,643,911,239,680,000, and then dividing that sum by 1, 2, 3, &c. to 13, which will make 6,227,020,800, the quotient, which is 635,013,559,600 will be the number of different ways 13 cards may be taken out of 52, and consequently the number fought.

The ARITHMETIC TRIANGLE;

or TABLE for COMBINATIONS.

A	B
1	1
2	1 1
3	1 2 1
4	1 3 3 1
5	1 4 6 4 1
6	1 5 10 10 5 1
7	1 6 15 20 15 6 1
8	1 7 21 35 35 21 7 1
9	1 8 28 56 70 56 28 8 1
10	1 9 36 84 126 126 84 36 9 1
11	1 10 45 120 210 252 210 120 45 10 1
12	1 11 55 165 330 462 462 330 165 55 11 1
13	1 12 66 220 495 792 792 495 220 66 12 1

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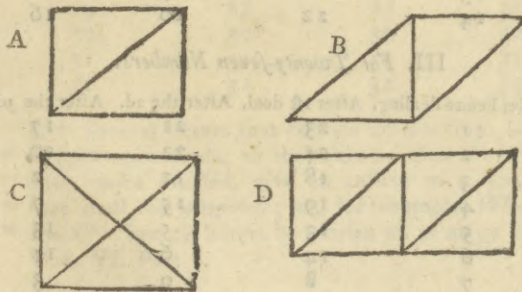
The construction of this table is very simple. The line *A a* consists of the first 12 numbers. The line *A b* consists everywhere of units; and second term 3, of the line *B c*, is composed of the two terms 1 and 2 in the preceding rank: the third term 6, in that line, is formed of the two terms 3 and 3 in the preceding rank: and so of the rest; every term, after the first, being composed of the two next terms in the preceding rank: and by the same method it may be continued to any number of ranks. To find by this table how often any number of things can be combined in another number, under 13, as suppose 5 cards out of 8; in the eighth rank look for the fifth term, which is 56, and that is the number required.

Though we have shown in the foregoing problems the manner of finding the combination of all numbers whatever, yet as this table answers the same purpose, for small numbers, by inspection only, it will be found useful on many occasions; as will appear by the following examples.

- V. To find how many different sounds may be produced by striking on a harpichord two or more of the seven natural notes at the same time. 1. The combinations of two in seven, by the foregoing triangle are, - - - 21
 2. The combinations of 3 in 7, are - - - 35
 3. The combinations of 4 in 7, are - - - 35
 4. The combinations of 5, are - - - 21
 5. The combinations of 6, are - - - 7
 6. The seven notes all together once. - - - 1

Therefore the number of all the sounds will be 120

VI. Take four square pieces of pasteboard, of the same dimension, and divide them diagonally, that is, by drawing a line from two opposite angles, as in the figures, into 8 triangles; paint 7 of these triangles with the primitive colours, red, orange, yellow, green, blue, indigo, violet, and let the eighth be white. To find how many chequers or regular four-sided figures, different either in form or colour, may be made out of those eight triangles. First, by combining two of these triangles, there may be formed either the triangular square *A*, or the inclined square *B* called a *rbomb*. Secondly, by combining four of the triangles, the large square *C* may be formed; or the long square *D*, called a *parallelogram*.



Combina-
tion.

Now the first two squares, consisting of two parts out of 8, they may each of them, by the eighth rank of the triangle, be taken 28 different ways, which makes 56. And the last two squares, consisting of four parts, may each be taken by the same rank of the triangle 70 times, which makes - 140
 To which add the foregoing number - 56

And the number of the different squares that } may be formed of the 8 triangles will be } 196

- VII. A man has 12 different sorts of flowers, and a large number of each sort. He is desirous of setting them in beds or flourishes in his parterre: Six flowers in some, 7 in others, and 8 in others; so as to have the greatest variety possible; the flowers in no two beds to be the same. To find how many beds he must have. 1. The combinations of 6 in 12 by the last rank of the triangle, are - 924
 2. The combinations of 7 in 12, are - 792
 3. The combinations of 8 in 12, are - 495

Therefore the number of beds must be - 2211

VIII. To find the number of chances that may be thrown on two dice. As each die has six faces, and as each face of one die may be combined with all the faces of the other, it follows, that 6 multiplied by 6, that is, 36, will be the number of all the chances; as is also evident from the following table:

Points.	Numb. of chances.	Numb. of points.
2 1.1	1	2
3 2.1 1.2	2	6
4 2.2 3.1 1.3	3	12
5 4.1 1.4 3.2 2.3	4	20
6 3.3 5.1 1.5 4.2 2.4	5	30
7 6.1 1.6 5.2 2.5 4.3 3.4	6	42
8 4.4 6.2 2.6 5.3 3.5	5	40
9 6.3 3.6 5.4 4.5	4	36
10 5.5 6.4 4.6	3	30
11 6.5 5.6	2	22
12 6.6	1	12
	36	252

It appears by this table, 1. That the number of chances for each point continually increases to the point of seven, and then continually decreases till 12: therefore if two points are proposed to be thrown, the equality, or the advantage of one over the other, is clearly visible (A). 2. The whole number of chances on the dice being 252, if that number be divided by 36, the number of different throws on the dice, the quotient is 7: it follows therefore, that at every throw there is an equal chance of bringing seven points. 3. As there are 36 chances on the dice, and only 6 of them doublets, it is 5 to 1, at any one throw, against throwing a doublet.

By

(A) It is easy from hence to determine whether a bett proposed at hazard, or any other game with the dice, be advantageous or not; if the dice be true (which, by the way, is rarely the case for any long time together, as it is so easy for those that are possessed of a dexterity of hand to change the true dice for false).

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tion.

By the same method the number of chances upon any number of dice may be found: for if 36 be multiplied by 6, that product, which is 216, will be the chances on 3 dice; and if that number be multiplied by 6, the product will be the chances on 4 dice, &c.

COMBINATIONS of the Cards. The following experiments, founded on the doctrine of combinations, may possibly amuse a number of our readers. The tables given are the basis of many experiments, as well on numbers, letters, and other subjects, as on the cards; but the effect produced by them with the last is the most surprising, as that which should seem to prevent any collusion, that is, the shuffling of the cards, is on the contrary the cause from whence it proceeds.

It is a matter of indifference what numbers are made use of in forming these tables. We shall here confine ourselves to such as are applicable to the subsequent experiments. Any one may construct them in such manner as is agreeable to the purposes he intends they shall answer.

To make them, for example, correspond to the nine digits and a cipher, there must be ten cards, and at the top of nine of them must be written one of the digits, and on the tenth a cipher. These cards must be placed upon each other in the regular order, the number 1 being on the first, and the cipher at bottom. You then take the cards in your left hand, as is commonly done in shuffling, and taking off the two top cards, 1 and 2, you place the two following, 3 and 4, upon them; and under those four cards the three following 5, 6, and 7: at the top you put the cards 8 and 9, and at the bottom the card marked 0; constantly placing in succession 2 at top and 3 at bottom: And they will then be in the following order:

8.9..3.4..1.2...5.6.7..0

If you shuffle them a second time, in the same manner, they will then stand in this order:

6.7..3.4..8.9..1.2.5..0

Thus, at every new shuffle, they will have a different order, as is expressed in the following lines:

- 1 shuffle 8.9.3.4.1.2.5.6.7.0
- 2 6.7.3.4.8.9.1.2.5.0
- 3 2.5.3.4.6.7.8.9.1.0
- 4 9.1.3.4.2.5.6.7.8.0
- 5 7.8.3.4.9.1.2.5.6.0
- 6 5.6.3.4.7.8.9.1.2.0
- 7 1.2.3.4.5.6.7.8.9.0

It is a remarkable property of this number, that the cards return to the order in which they were first placed, after a number of shuffles, which added to the number of columns that never change the order, is equal to the number of cards. Thus the number of shuffles is 7, and the number of columns in which the cards marked 3, 4, &c. never change their places is 3, which are equal to 10, the number of the cards. This property is not common to all numbers; the cards sometimes returning to the first order in a less number, and sometimes in a greater number of shuffles than that of the cards.

Combina-
tion.

TABLES OF COMBINATIONS,

Constructed on the foregoing principles.

I. For ten numbers.

Order before dealing.	After 1st deal.	After the 2d.	After the 3d.
1	8	6	2
2	9	7	5
3	3	3	3
4	4	4	4
5	1	8	6
6	2	9	7
7	5	1	8
8	6	2	9
9	7	5	1
0	0	0	0

These tables, and the following examples at piquet except the 36th, appear to have been composed by M. Guyot.

II. For twenty-four Numbers.

Order before dealing.	After 1st deal.	After the 2d.	After the 3d.
1	23	21	17
2	24	22	20
3	18	12	2
4	19	15	7
5	13	5	13
6	14	6	14
7	8	9	3
8	9	3	18
9	3	18	12
10	4	19	15
11	1	23	21
12	2	24	22
13	5	13	5
14	6	14	6
15	7	8	9
16	10	4	19
17	11	1	23
18	12	2	24
19	15	7	8
20	16	10	4
21	17	11	1
22	20	16	10
23	21	17	11
24	22	20	16

III. For Twenty-seven Numbers.

Order before dealing.	After 1st deal.	After the 2d.	After the 3d.
1	23	21	17
2	24	22	20
3	18	12	2
4	19	15	7
5	13	5	13
6	14	6	14
7	8	9	3
8	9	3	18
9	3	18	12
10	4	19	16
11	1	13	21
12	2	24	22
13	5	13	5

Combina- tion.	Order before dealing.	After 1st deal.	After the 2d.	After the 3d.
	14	6	14	6
	15	7	8	9
	16	10	4	19
	17	11	1	23
	18	12	2	24
	19	15	7	8
	20	16	10	4
	21	17	11	1
	22	20	16	10
	23	21	17	11
	24	22	20	16
	25	25	25	25
	26	26	26	26
	27	27	27	27

IV. For Thirty-two Numbers.

Order before dealing.	After 1st deal.	After the 2d.	After the 3d.
1	28	26	22
2	29	27	25
3	23	17	7
4	24	20	12
5	18	10	9
6	19	11	3
7	13	1	28
8	14	2	29
9	8	14	2
10	9	8	14
11	3	23	17
12	4	24	20
13	1	28	26
14	2	29	27
15	5	18	10
16	6	19	11
17	7	13	1
18	10	9	8
19	11	3	23
20	12	4	24
21	15	5	18
22	16	6	19
23	17	7	13
24	20	12	4
25	21	15	5
26	22	16	6
27	25	21	15
28	26	22	16
29	27	25	21
30	30	30	30
31	31	31	31
32	32	32	32

I. "Several letters that contain no meaning, being written upon cards, to make them, after they have been twice shuffled, give an answer to a question that shall be proposed; as, for example, *What is love?*" Let 24 letters be written on as many cards
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which, after they have been twice shuffled, shall give the following answer:

A dream of joy that soon is o'er.

First, write one of the letters in that line on each of the cards (B). Then write the answer on a paper, and assign one of the 24 first numbers to each card, in the following order:

A D R E A M O F J O Y T H A T S O O N
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
 I S O ' E R.
 20 21 22 23 24

Next, write on another paper a line of numbers from 1 to 24, and looking in the table for 24 combinations, you will see that the first number after the second shuffle is 21; therefore the card that has the first letter of the answer, which is A, must be placed against that number, in the line of numbers you have just made (C.) In like manner the number 22 being the second of the same column, indicates that the card which answers to the second letter D of the answer, must be placed against that number; and so of the rest. The cards will then stand in the following order:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
 O O F S A M N T O I S R H A E O ' E J O
 20 21 22 23 24
 R A D Y T

From whence it follows, that after these cards have been twice shuffled, they must infallibly stand in the order of the letters in the answer.

Observe. 1. You should have several questions, with their answers, consisting of 24 letters, written on cards; these cards should be put in cases, and numbered, that you may know to which question each answer belongs. You then present the questions; and when any one of them is chosen, you pull out the case that contains the answer, and showing that the letters written on them make no sense, you then shuffle them, and the answer becomes obvious.

2. To make this experiment the more extraordinary, you may have three cards, on each of which an answer is written; one of which cards must be a little wider, and another a little longer, than the others. You give these three cards to any one, and when he has privately chosen one of them, he gives you the other two, which you put in your pocket without looking at them, having discovered by feeling which he has chosen. You then pull out the case that contains the cards that answer to his question, and perform as before.

3. You may also contrive to have a long card at the bottom after the second shuffle. The cards may be then cut several times, till you perceive by the touch that the long card is at bottom, and then give the answer;
 P p

(B) These letters should be written in capitals on one of the corners of each card, that the words may be easily legible when the cards are spread open.

(C) For the same reason, if you would have the answer after one shuffle, the cards must be placed according to the first column of the table; or if after three shuffles, according to the third column.

Combina-
tion.

five; for the repeated cuttings, however often, will make no alteration in the order of the cards.

The second of these observations is applicable to some of the subsequent experiments, and the third may be practised in almost all experiments with the cards. You should take care to put up the cards as soon as the answer has been shewn; so that if any one should desire the experiment to be repeated, you may offer another question, and pull out those cards that contain the answer.

Though this experiment cannot fail of exciting at all times pleasure and surprize, yet it must be owned that a great part of the applause it receives arises from the address with which it is performed.

II. "The 24 letters of the alphabet being written upon so many cards, to shuffle them, and pronounce the letters shall then be in their natural order; but that not succeeding, to shuffle them a second time, and then show them in proper order." Write the 24 letters on the cards in the following order:

1 2 3 4 5 6 7 8 9 10 11 12
R S H Q E F T P G U X C
13 14 15 16 17 18 19 20 21 22 23 24
N O D Y Z I K & A B L M

The cards being disposed in this manner, show them upon the table, that it may appear they are promiscuously marked. Then shuffle and lay them again on the table, pronouncing that they will be then in alphabetical order. Appear to be surprized that you have failed; take them up again, and give them a second shuffle, and then counting them down on the table they will all be in their natural order.

III. "Several letters being written promiscuously upon 32 cards, after they have been once shuffled, to find in a part of them a question; and then shuffle the remainder a second time, to show the answer. Suppose the question to be, *What is each Briton's boast?* and the answer, *His liberty*; which taken together contain 32 letters."

After you have written those letters on 32 cards, write on a paper the words, *his liberty*, and annex to the letters the first ten numbers thus:

H I S L I B E R T Y.
1 2 3 4 5 6 7 8 9 10

Then have recourse to the table of combinations for ten numbers, and apply the respective numbers to them in the same manner as in experiment I. taking the first column, as these are to be shuffled only once according to that order.

1 2 3 4 5 6 7 8 9 10
I B S L E R T H I Y

This is the order in which these cards must stand after the whole number 32 has been once shuffled, so that after a second shuffle they may stand in their proper order. Next dispose the whole number of letters according to the first column for 32 letters; the last ten are to be here placed in the order above; as follows:

W H A T I S E A C H B R I T O N ' S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

B O A S T ?
18 19 20 21 22

Combina-
tion.

I B S L E R T H I Y
23 24 25 26 27 28 29 30 31 32

Therefore, by the first column of the table, they will next stand thus:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
I T B R O N S C H B O A E A S T long card.
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
I I S B S L I B E R T W H H I Y

You must observe, that the card here placed the 16th in order, being the last of the question, is a long card; that you may cut them, or have them cut, after the first shuffle, at that part, and by that means separate them from the other ten cards that contain the answer.

Your cards being thus disposed, you show that they make no meaning; then shuffle them once, and cutting them at the long card, you give the first part to any one, who reads the question, but can find no answer in the others, which you open before him; you then shuffle them a second time, and show the answer as above.

IV. "To write 32 letters on so many cards, then shuffle and deal them by twos to two persons, in such manner, that the cards of one shall contain a question, and those of the other an answer. Suppose the question to be *Is nothing certain?* and the answer, *Yes, disappointment.*"

Over the letters of this question and answer, write the following numbers, which correspond to the order in which the cards are to be dealt by two and two.

I S N O T H I N G C E R T A I N ?
31 32 27 28 23 24 19 20 15 16 11 12 7 8 3 4
Y E S, D I S A P O I N T M E N T.
29 30 25 26 21 22 17 18 13 14 9 10 5 6 1 2

Then have recourse to the first column of the table for 32 numbers, and dispose these 32 cards in the following order, by that column.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
O I E R G C A N T P I N T A I S
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
T M E H S D I N N O Y N T E I S

The cards being thus disposed, shuffle them once, and deal them two and two; when one of the parties will necessarily have the question, and the other the answer.

Instead of letters you may write words upon the 32 cards, 16 of which may contain a question, and the remainder the answer; or what other matter you please. If there be found difficulty in accommodating the words to the number of cards, there may be two or more letters or syllables written upon one card.

V. "The five beatitudes." The five blessings we will suppose to be, 1. Science, 2. Courage, 3. Health, 4. Riches, and 5. Virtue. These are to be found upon cards that you deal, one by one, to five persons. First, write the letters of these words successively, in the

Combina-
tion. the order they stand, and then add the numbers here
annexed to them.

SCIENCE COURAGE
31 26 21 16 11 6 1 32 27 22 17 12 7 2
HEALTH RICHES
28 23 18 13 8 3 29 24 19 14 9 4
VIRTUE
30 25 20 15 10 5

15 Ten } spades
16 Nine }
17 King clubs
18 Ten } hearts
19 Nine }
20 Seven clubs
21 Ace diamonds
22 Knave spades
23 Queen hearts

24 Knave hearts
25 Ace spades
26 King diamonds
27 Nine clubs
28 Ace } hearts
29 King }
30 Eight clubs
31 King } spades
32 Queen }

Combina-
tion.

Then range them in order agreeable to the first column of the table for 32 numbers, as in the last experiment. Thus,

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
L H N A T E R E U A C R G T I U
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
E E C I I C H S O H R E E V S C

Next take a pack of cards and write on the four first the word Science; on the four next, the word Courage; and so of the rest.

Matters being thus prepared, you show that the cards on which the letters are written convey no meaning. Then take the pack on which the words are written, and spreading open the first four cards, with their backs upward, you desire the first person to choose one. Then close those cards, and spread the next four to the second person; and so to all the five; telling them to hold up their cards lest you should have a confederate in the room.

You then shuffle the cards, and deal them one by one, in the common order, beginning with the person who chose the first card, and each one will find in his hand the same word as is written on his card. You will observe, that after the sixth round of dealing, there will be two cards left, which you give to the first and second persons, as their words contain a letter more than the others.

VI. "The cards of the game of piquet being mixed together, after shuffling them, to bring, by cutting them, all the cards of each suit together." The order in which the cards must be placed to produce the effect desired being established on the same principle as that explained in experiment II. except that the shuffling is here to be repeated three times, we think it will be sufficient to give the order in which they are to be placed before the first shuffle.

Order of the Cards.

1 Ace } clubs	8 Ten } diamonds
2 Knave } clubs	9 Nine } diamonds
3 Eight } diamonds	10 Queen } diamonds
4 Seven } diamonds	11 Knave } diamonds
5 Ten clubs	12 Queen clubs
6 Eight } spades	13 Eight } hearts
7 Seven } spades	14 Seven } hearts
wide card	wide card

You then shuffle the cards, and cutting at the wide card, which will be the seven of hearts, you lay the eight cards that are cut, which will be the suit of hearts, down on the table. Then shuffling the remaining cards a second time, you cut at the second wide card, which will be the seven of spades, and lay, in like manner, the eight spades down on the table. You shuffle the cards a third time, and offering them to any one to cut, he will naturally cut them at the wide card (D), which is the seven of diamonds, and consequently divide the remaining cards into two equal parts, one of which will be diamonds and the other clubs.

VII. "The cards at piquet being all mixed together, to divide the pack into two unequal parts, and name the number of points contained in each part." You are first to agree that each king, queen, and knave, shall count, as usual, 10, the ace 1, and the other cards according to the number of the points. Then dispose the cards, by the table for 32 numbers, in the following order, and observe that the last card of the first division must be a wide card.

Order of the Cards before shuffling.

1 Seven hearts	17 Nine diamonds
2 Nine clubs	18 Ace spades
3 Eight hearts	19 Ten clubs
4 Eight } spades	20 Knave } diamonds
5 Knave } spades	21 Eight } diamonds
6 Ten } spades	22 King } diamonds
7 Queen } clubs	23 Seven spades
8 Ace } clubs	24 Seven } diamonds
9 Ace hearts	25 Queen } diamonds
wide card	
10 Nine hearts	26 Knave hearts
11 Queen spades	27 King clubs
12 Knave clubs	28 Nine } spades
13 Ten diamonds	29 King } spades
14 Ten } hearts	30 Ace diamonds
15 King } hearts	31 Seven } clubs
16 Queen } hearts	32 Eight } clubs

You then shuffle them carefully, according to the method before described, and they will stand in the following order.

(D) You must take particular notice whether they be cut at the wide card, and if they are not, you must have them cut, or cut them again yourself.

Combina-
tion.

1	Nine	} spades	9
2	King		10
3	Seven		7
4	Seven diamonds		7
5	Ace spades		1
			carried up 34

6	Ten clubs	10
7	Ten diamonds	10
8	Ten hearts	10
9	Ace clubs	1
10	Ace hearts (wide card)	1
		brought up 34
		total 66

25	Seven spades	10
26	Seven diamonds	10
27	Nine spades	10
28	King	} spades
29	Ace	

30	Ten clubs
31	Ten diamonds
32	Ace hearts wide card.

Combina-
tion.

The cards being thus disposed, you ask your adversary in what suit you shall repique him? If he say in clubs or diamonds, you must deal the cards by threes, and the hands will be as follows:

11	Eight hearts	8	22	Queen hearts	10
12	Eight spades	8	23	Nine	} diamonds
13	Seven hearts	7	24	Knave	
14	Nine clubs	9	25	Eight	8
15	Knave	} spades	10	26	King
16	Ten		10	27	Queen
17	Queen clubs	10	28	Knave hearts	10
18	Nine hearts	9	29	King clubs	10
19	Queen spades	10	30	Ace diamonds	1
20	Knave clubs	10	31	Seven	} clubs
21	King hearts	10	32	Eight	
			carried up 101		
				total 194	

Elder.	Younger.
Hearts, king	Clubs, ace
_____ queen	_____ king
_____ knave	_____ queen
_____ nine	_____ knave
_____ eight	_____ nine
_____ seven	Diamonds, ace
Spades, queen	_____ king
_____ knave	_____ queen
_____ eight	_____ knave
Diamonds, eight	_____ nine
Clubs, eight	Spades, ten
_____ seven	Hearts, ten
Rentrée, or take in of the elder.	Rentrée of the younger.
Seven spades	Ten clubs
Seven diamonds	Ten diamonds
Nine	Ace hearts
King } spades	
Ace }	

When the cards are by shuffling disposed in this order, you cut them at the wide card, and pronounce that the cards you have cut off contain 66 points, and consequently the remaining part 194.

VIII. "The Inconceivable Repique (E)." When you would perform this experiment with the cards used in the last, you must observe not to disorder the first 10 cards in laying them down on the table. Putting those cards together, in their proper order, therefore, you shuffle them a second time in the same manner, and offer them to any one to cut, observing carefully if he cut them at the wide card, which will be the ace of hearts, and will then be at top; if not, you must make him, under some pretence or other, cut them till it is; and the cards will then be ranged in such order that you will repique the person against whom you play, though you let him choose (even after he has cut) in what suit you shall make the repique.

Order of the cards after they have been shuffled and cut.

1	Eight hearts	13	Seven	} clubs
2	Eight	14	Eight	
3	Knave	} spades	15	Knave hearts
4	Ten		16	King clubs
5	Queen	} clubs	17	Nine
6	Knave		18	Knave
7	King	} hearts	19	Nine hearts
8	Queen		20	Queen spades
9	Eight	} diamonds	21	Seven hearts
10	King		22	Nine clubs
11	Queen	} diamonds	23	Ten hearts
12	Ace		24	Ace clubs

If he against whom you play, who is supposed to be elder hand, has named clubs for the repique, and has taken in five cards, you must then lay out the queen, knave, and nine of diamonds, and you will have, with the three cards you take in, a fixiem major in clubs, and quatorze tens. If he leave one or two cards, you must discard all the diamonds.

If he require to be repiqued in diamonds, then discard the queen, knave, and nine of clubs: or all the clubs, if he leave two cards; and you will then have a hand of the same strength as before.

Note. If the adversary should discard five of his hearts, you will not repique him, as he will then have a septiem in spades: or if he only take one card: but neither of these any one can do, who has the least knowledge of the game. If the person against whom you play would be repiqued in hearts or spades, you must deal the cards by twos, and the game will stand thus:

Elder hand.	Younger hand.
King	Ace
Knave	} clubs
Nine	
Eight	Ace
	Queen
	Queen

(E) This manœuvre of piquet was invented by the countess of L— (a French lady), and communicated by her to M. Guyot.

Combina- tion.	Elder hand.	Younger hand.	Cards.	Colours.	Objects.	Words.	Combina- tion.
}	Queen	Queen	5	White	Bird	To hear	}
	Knave	Knave	6	White	Orange	Beauty	
}	Nine	Ten	7	Red	Butterfly	My	}
	Eight	King	8	Red	Flower	Notes	
}	Seven	Queen	9	Red	Flower	In	}
	Eight	Knave	10	Red	Butterfly	Shepherdefs	
}	Seven	Ten	11	Green	Butterfly	Lover	}
	Eight	Nine	12	Green	Butterfly	Your	
	Retrée.	Retrée.	13	White	Flower	Of	
	Seven spades	Ten clubs	14	White	Flower	an inconstant	
	Seven diamonds	Ten diamonds	15	Yellow	Orange	Image	
	Nine	Ace hearts	16	Yellow	Flower	Enchanting	
}	King		17	White	Orange	Adorn	}
	Ace		18	Yellow	Butterfly	My	
			19	Yellow	Butterfly	Phyllis	
			20	White	Bird	Birds	
			21	Red	Orange	Sing	
			22	Red	Orange	Dear	
			23	Green	Orange	and sweetness	
			24	Green	Orange	The	
			25	Green	Bird	Of	
			26	Green	Bird	Present	
			27	Yellow	Flower	As	
			28	Red	Bird	Changes	
			29	Red	Bird	Bosom	
			30	Yellow	Orange	Me	
			31	White	Butterfly	Your	
			32	White	Butterfly	I long	

If he require to be repiqued in hearts, you keep the quint to a king in hearts, and the ten of spades, and lay out which of the rest you please: then, even if he should leave two cards, you will have a fixiem major in hearts, and quatorze tens, which will make a repique.

But if he demand to be repiqued in spades; at the end of the deal you must dexterously pass the three cards that are at the bottom of the stock (that is, the ten of clubs, ten of diamonds, and ace of hearts) to the top (F), and by that means you reserve the nine, king, and ace of spades for yourself; so that by keeping the quint in hearts, though you should be obliged to lay out four cards, you will have a fixiem to a king in spades, with which and the quint in hearts you must make a repique.

Observe here likewise, that if the adversary lay out only three cards, you will not make the repique; but that he will never do, unless he be quite ignorant of the game, or has some knowledge of your intention.

This last stroke of piquet has gained great applause, when those that have publicly performed it have known how to conduct it dexterously. Many persons who understand the nature of combining the cards, have gone as far as the passing the three cards from the bottom of the stock, and have then been forced to confess their ignorance of the manner in which it was performed.

IX. "The Metamorphosed Cards." Provide 32 cards that are differently coloured, on which several different words are written, and different objects painted. These cards are to be dealt two and two to four persons, and at three different times, shuffling them each time. After the first deal, every one's cards are to be of the same colour; after the second deal they are all to have objects that are similar: and after the third, words that convey a sentiment.

Dispose of the cards in the following order.

Cards.	Colours.	Objects.	Words.
1	Yellow	Bird	I find
2	Yellow	Bird	In you
3	Green	Flower	Charming
4	Green	Flower	Flowers

The cards thus coloured, figured, and transcribed, are to be put in a case, in the order they here stand.

When you would perform this experiment you take the cards out of the case, and show, without changing the order in which they were put, that the colours, objects, and words, are all placed promiscuously. You then shuffle them in the same manner as before, and deal them, two and two, to four persons, observing that they do not take up their cards till all are dealt, nor mix them together: and the eight cards dealt to each person will be found all of one colour. You then take each person's cards, and put those of the second person under those of the first, and those of the fourth person under those of the third. After which you shuffle them a second time; and having dealt them in the same manner, on the first person's cards will be painted all the birds; on the second person's cards, all the butterflies; on those of the third, the oranges; and on those of the fourth, the flowers. You take the cards a second time, and observing the same precautions, shuffle and deal them as before; and then the first person, who had the last time the birds in his hand, will have the words that compose this sentence:

Sing, dear birds; I long to hear your enchanting notes.

The second person, who the last deal had the butterflies, will now have these words:

Of an inconstant lover your changes present me the image.

The third, who had the oranges, will have this sentence:

As

(F) The manner of doing this is explained in the article LEGERDEMAIN.

Combina-
tion
||
Comedy.

As in my Phyllis, I find in you beauty and sweetness.

The fourth, who had the flowers, will have these words:

Charming flowers, adorn the bosom of my shepherdess.

It seems quite unnecessary to give any further detail, as they who understand the foregoing experiments will easily perform this.

Among the different purposes to which the doctrine of combinations may be applied, those of writing in cipher, and deciphering, hold a principal place. See the article CIPHER.

COMBINATION, in *Chemistry*, signifies the union of two bodies of different natures, from which a new compound body results. For example, when an acid is united with an alkali, we say that a combination betwixt these two saline substances takes place; because from this union a neutral salt results, which is composed of an acid and an alkali.

COMBUST, in *Astronomy*. When a planet is in conjunction with the sun, or not distant from it above half its disk; it is said to be combust, or in combustion.

According to Argol, a planet is combust, or in combustion, when not above eight degrees and thirty minutes distant from the sun, either before or after him.

COMBUSTIO PECUNIÆ, the ancient way of trying mixed and corrupt money, by melting it down, upon payments into the exchequer. In the time of King Henry II. a constitution was made, called the trial by *combustion*; the practice of which differed little or nothing from the present method of assaying silver. But whether this examination of money by combustion was to reduce an equation to money only to sterling, viz. a due proportion of alloy with copper, or to reduce it to pure fine silver, does not appear. On making the constitution of trial it was considered, that though the money did answer *numero et pondere*, it might be deficient in value; because mixed with copper or brass, &c.

COMBUSTION, a term denoting the operation of fire upon any inflammable substance, by which it smokes, flames, and is reduced to ashes.

There is not a phenomenon in nature by which the attention of philosophers has been more engaged, nor which has puzzled them more to account for, than this very common operation. To explain it, theories have been invented the most opposite and contradictory to one another that can be imagined; and, till very lately, the state of science did not afford data sufficient to explain it in a rational manner. See CHEMISTRY *Index*.

COMEDY, a sort of dramatic poetry, which gives a view of common and private life, recommends virtue, and corrects the vices and follies of mankind by means of ridicule. See the article POETRY.

This last kind alone was received among the Romans, who nevertheless made a new subdivision of it into ancient, middle, and new, according to the various periods of the commonwealth. Among the ancient comedies were reckoned those of Livius Andronicus; among the middle those of Pacuvius; and among the new ones, those of Terence. They likewise

distinguished comedy according to the quality of the persons represented, and the dress they wore, into togatæ, prætextatæ, trabeatæ, and tabernariæ, which last agrees pretty nearly with our farces. Among us, comedy is distinguished from farce, as the former represents nature as she is; the other distorts and overcharges her. They both paint from the life, but with different views: the one to make nature known, the other to make her ridiculous.

COMENIUS, JOHN AMOS, a grammarian and Protestant divine, born in Moravia in 1592. He was eminent for his design to introduce a new method of teaching languages; for which purpose he published some essays in 1616, and had prepared some others, when the Spaniards pillaged his library, after having taken the city of Fulnek, where he was minister and master of the school. Comenius fled to Lesna, a city of Poland, and taught Latin there. The book he published in 1631, under the title of *Janua Linguarum reſerata*, gained him a prodigious reputation, inſomuch that he was offered a commission for regulating all the ſchools in Poland. The parliament of England deſired his aſſiſtance to regulate the ſchools in that kingdom. He arrived at London in 1641; and would have been received by a committee to hear his plan had not the parliament been taken up with other matters. He therefore went to Sweden, being invited by a generous patron, who ſettled a ſtipend upon him that delivered him from the fatigues of teaching; and now he employed himſelf wholly in diſcovering general methods for thoſe who inſtructed youth. In 1657 he published the different parts of his new method of teaching. He was not only taken up with the reformation of ſchools; but he alſo filled his brain with prophecies, the fall of Antichriſt, Millennium, &c. At laſt Comenius took it into his head to addreſs Louis XIV. of France, and to ſend him a copy of the prophecies of Drabicius; inſinuating that it was to this monarch God promiſed the empire of the world. He became ſenſible at laſt of the vanity of his labours, and died in 1671.

COMET, an opaque, ſpherical, and ſolid body like a planet, performing revolutions about the ſun in elliptical orbits, which have the ſun in one of their foci.

There is a popular diſiſion of comets into *tailed*, *bearded*, and *hairy* comets; though this diſiſion rather relates to the different circumſtances of the ſame comet, than to the phenomena of ſeveral. Thus, when the light is weſtward of the ſun, and ſets after it, the comet is ſaid to be *tailed*, becauſe the train follows it in the manner of a tail: when the comet is eaſtward of the ſun, and moves from it, the comet is ſaid to be *bearded*, becauſe the light marches before it in the manner of a beard. Laſtly, when the comet and the ſun are diametrically oppoſite (the earth between them), the train is hid behind the body of the comet, except a little that appears round it in form of a border of *hair*: and from this laſt appearance the word comet is derived; as κομητης, *cometa*, comes from κομη, *coma*, hair. But there have been comets whoſe diſk was as clear, as round, and as well defined, as that of Jupiter, without either tail, beard, or coma. See ASTRONOMY *Index*.

Comenius,
Comet.

COMETARIUM,

Cometa-
rium
||
Comitia.

COMETARIUM, a curious machine, exhibiting an idea of the revolution of a comet about the sun. See *ASTRONOMY Index*.

COMETEAN, a town of Bohemia in the circle of Saltz, with a handsome town-house. It was taken by storm in 1421, and all the inhabitants, men, women, and children, put to the sword. It is seated in a fertile plain, in E. Long. 13. 35. N. Lat. 50. 30.

COMETES. See *BOTANY Index*.

COMFREY. See *SYMPHYTUM, BOTANY Index*.

COMINES, PHILIP DE, an excellent historian, born of a noble family in Flanders in 1446. He lived in a kind of intimacy with Charles the Bold, duke of Burgundy, for about eight years; but being seduced to the court of France by Louis XI. he was highly promoted by him, and executed several successful negotiations. After this king's death he experienced many troubles on account of being a foreigner, by the envy of other courtiers, and lay long in prison before he was discharged: he died in 1509. Comines was a man of more natural abilities than learning; he spoke several living, but knew nothing of the dead languages; he has left behind him some memoirs of his own times, that are admired by all true judges of history. Catharine de Medicis used to say, that Comines made as many heretics in politics as Luther had done in religion.

COMINES, a town of French Flanders on the lines which the French have made to defend their country against the Austrian Netherlands. It is situated on the river Lis, in E. Long. 3. 1. N. Lat. 50. 30.

COMITATUS, in *Law*, a county. Ingulphus tells us, that England was first divided into counties by King Alfred; and the counties into hundreds, and these again into tythings: and Fortescue writes, that *regnum Angliæ per comitatus, ut regnum Franciæ per ballivatus distinguitur*. Sometimes it is taken for a territory or jurisdiction of a particular place; as in Mat. Paris, anno 1234. See *COUNTY*.

COMITIA, in Roman antiquity, were general assemblies of the people, lawfully called by some magistrate for the enjoyment or prohibition of any thing by their votes.

The proper comitia were of three sorts; *curiata*, *centuriata*, and *tributa*; with reference to the three grand divisions of the city and people into *curiæ*, *centuriæ*, and *tribes*: For, by comitia *calata*, which we sometimes meet with in authors, in earlier times were meant all the comitia in general; the word *calata* from *καλω*, or *calo*, being their common epithet; though it was at last restrained to two sorts of assemblies, those for the creation of priests, and those for the regulation of last wills and testaments.

The *comitia curiata* owe their origin to the division which Romulus made of the people into 30 *curiæ*; ten being contained in every tribe. They answered in most respects to the parishes in our cities, being not only separated by proper bounds and limits, but distinguished too by their different places set apart for the celebration of divine service, which was performed by particular priests (one to every *curia*), with the name of *curiones*.

Before the institution of the comitia *centuriata*, all the grand concerns of the state were transacted in the assembly of the *curiæ*; as the election of kings and

other chief officers, the making and abrogating of laws, and the judging of capital causes. After the expulsion of the kings, when the commons had obtained the privilege to have tribunes and *ædiles*, they elected them for some time at these assemblies; but that ceremony being at length transferred to the comitia *tributa*, the *curiæ* were never convened to give their votes, except now and then upon account of making some particular law relating to adoptions, wills, and testaments, or the creation of officers for an expedition; or for electing some of the priests, as the *flamines*, and the *curio maximus*, or superintendent of the *curiones*, who were themselves chosen by every particular *curia*.

The power of calling these assemblies belonged at first only to the kings; but upon the establishment of the democracy, the same privilege was allowed to most of the chief magistrates, and sometimes to the pontifices.

The persons who had the liberty of voting here were such Roman citizens as belonged to the *curiæ*; or such as actually lived in the city, and conformed to the customs and rites of their proper *curiæ*; all those being excluded who dwelt without the bounds of the city, retaining the ceremonies of their own country, though they had been honoured with the *jus civitatis*, or admitted free citizens of Rome. The place where the *curiæ* met was the *comitium*, a part of the forum: No set time was appointed for the holding these, or any other of the comitia, but only as business required.

The people being met together, and confirmed by the report of good omens from the augurs (which was necessary in all the assemblies), the rogatio, or business to be proposed to them was publicly read. After this (if none of the magistrates interposed), upon the order of him that presided in the comitia, the people divided into their proper *curias*, and consulted of the matter; and then the *curias* being called out, as it happened by lot, gave their votes man by man, in ancient times *viva voce*, and afterwards by tablets; the most votes in every *curia* going for the voice of the whole *curia*, and the most *curiæ* for the general consent of the people.

In the time of Cicero, the comitia *curiata* were so much out of fashion, that they were formed only by 30 *lictors* representing the 30 *curiæ*; whence, in his second oration against Rullus, he calls them *comitia adumbrata*.

The *comitia centuriata* were instituted by Servius Tullius; who, obliging every one to give a true account of what he was worth, according to those accounts, divided the people into six ranks or classes, which he subdivided into 193 centuries. The first class, containing the equites and richest citizens, consisted of 98 centuries. The second, taking in the tradesmen and mechanics, consisted of 22 centuries. The third, 20. The fourth, 22. The fifth, 30. The sixth, filled up with the poorer sort, but one century: and this though it had the same name with the rest, yet was seldom regarded, or allowed any power in public matters. Hence it is a common thing with the Roman authors, when they speak of the classes, to reckon no more than five, the sixth not being worth their notice. This last class or order was divided:

Comitia.

Comitia. vided into two parts or orders; the *proletarii* and the *capite censi*. The former, as their name implies, were designed purely to stock the republic with men, since they could supply it with so little money: and the latter, who paid the lowest tax of all, were rather counted and marshalled by their heads than by their estates.

Persons of the first rank, by reason of their pre-eminence, had the name of *classici*; whence came the name of *classici auctores* for the most approved writers. All others, of what classis soever, were said to be *infra classem*. The assembly of the people by centuries was held for the electing of consuls, censors, and prætors; as also for the judging of persons accused of what they called *crimen perduellionis*, or actions by which the party had showed himself an enemy to the state, and for the confirmation of all such laws as were proposed by the chief magistrates, who had the privilege of calling these assemblies.

The place appointed for their meeting was the *campus martius*; because in the primitive times of the commonwealth, when they were under continual apprehensions of enemies, the people, to prevent any sudden assault, went armed, in martial order, to hold these assemblies; and were for that reason forbidden by the laws to meet in the city, because an army was upon no account to be marshalled within the walls: yet, in later ages, it was thought sufficient to place a body of soldiers as a guard in the *janiculum*, where an imperial standard was erected, the taking down of which denoted the conclusion of the *comitia*.

Though the time of holding these *comitia* for other matters was undetermined; yet the magistrates, after the year of the city 601, when they began to enter on their place, on the kalends of January, were constantly *designed* about the end of July and the beginning of August.

All the time between their election and confirmation they continued as private persons, that inquisition might be made into the election, and the other candidates might have time to enter objections, if they met with any suspicion of unfair dealing. Yet, at the election of the censors, this custom did not hold; but as soon as they were elected, they were immediately invested with the honour.

By the institution of these *comitia*, Servius Tullius secretly conveyed the whole of the power from the commons; for the centuries of the first and richest class being called out first, who were three more in number than all the rest put together, if they all agreed, as generally they did, the business was already decided, and the other classes were needless and insignificant. However, the three last scarce ever came to vote.

The commons, in the time of the free state, to remedy this disadvantage, obtained, that before they proceeded to voting any matter at these *comitia*, that century should give their suffrages first upon whom it fell by lot, with the name of *centuria prerogativa*; the rest being to follow according to the order of the classes. After the constitution of the 35 tribes into which the classes and their centuries were divided, in the first place, the tribes cast lots which should be the *prerogative tribe*; and then the centuries of the tribes for the honour of being a prerogative century. All

the other tribes and centuries had the appellation of *Comitia. jure vocatæ*, because they were called out according to their proper places.

The prerogative century being chosen by lot, the chief magistrate, sitting in a tent in the middle of the *campus martius*, ordered that century to come out and give their voices; upon which they presently separated from the rest of the multitude, and came into an inclosed apartment, which they termed *septa*, or *ovilia*, passing over the *pontes* or narrow boards laid there for the occasion; on which account, *de pontibus dejici* signifies to be denied the privilege of voting, and persons thus dealt with are called *de pontani*.

At the higher end of the *pontes* stood the *diribitores* (a sort of under officers so called from their marshalling the people), and delivered to every man, in the election of magistrates as many tablets as there appeared candidates, one of whose names was written upon every tablet. A proper number of great chests were set ready in the *septa*, and every body threw in which tablet he pleased.

By the chests were placed some of the public servants, who taking out the tablets of every century, for every tablet, made a prick or a point in another tablet which they kept by them. Thus, the business being decided by most points, gave occasion to the phrase *omne tulit punctum*, and the like.

The same method was observed in the judiciary process at these *comitia*, and in the confirmation of laws; except that, in both these cases, only two tablets were offered to every person; on one of which was written U. R. and on the other A, in capital letters; the two first standing for *uti rogas*, "be it as you desire," relating to the magistrate who proposed the question; and the last for *antiquo*, or "I forbid it."

It is remarkable, that though in the election of magistrates, and in the ratification of laws, the votes of that century, whose tablets were equally divided, signified nothing; yet in trials of life and death, if the tablets *pro* and *con* were the same in number, the person was actually acquitted.

The division of people into *tribes* was an invention of Romulus, after he had admitted the Sabines into Rome; and though he constituted at that time only three, yet as the state increased in power, and the city in number of inhabitants, they rose by degrees to 35. For a long time after this institution, a *tribe* signified no more than such a space of ground with its inhabitants. But at last the matter was quite altered, and a tribe was no longer *pars urbis*, but *pars civitatis*; not a quarter of the city, but a company of citizens living where they pleased. This change was chiefly occasioned by the original difference between the tribes in point of honour. For Romulus having committed all fordid and mechanic arts to the care of strangers, slaves, and libertines; and reserved the more honest labour of agriculture to the freemen and citizens, who by this active course of life might be prepared for martial service; the *tribus rusticæ* were for this reason esteemed more honourable than the *tribus urbanæ*. And now all persons being desirous of getting into the more creditable division; and there being several ways of accomplishing their wishes, as by adoption, by the power of censors, or the like; that rustic tribe which had the most worthy names in its roll had the preference

Comitialis
Morbus
||
Comma.

rence to all others, though of the same general denomination. Hence all of the same great family, bringing themselves by degrees into the same tribe, gave the name of their family to the tribe they honoured; whereas at first the generality of the tribes did not borrow their names from persons but from places.

The first assembly of the tribes we meet with is about the year of Rome 263, convened by Sp. Sici-nius, tribune of the commons, upon account of the trial of Coriolanus. Soon after, the tribunes of the commons were ordered to be elected here; and at last, all the inferior magistrates, and the collegiate priests. The same comitia served for the enacting of laws relating to war and peace, and all others proposed by the tribunes and plebeian officers, though they had not properly the name of *leges*, but *plebiscita*. They were generally convened by the tribunes of the commons; but the same privilege was allowed to all the chief magistrates. They were confined to no place; and therefore sometimes we find them held in the comitium; sometimes in the campus martius, and now and then in the capitol. The proceedings were in most respects answerable to those already described in the account of the other comitia, and therefore need not be insisted on. Only we may farther observe of the comitia in general, that when any candidate was found to have most tablets for a magistracy, he was declared to be *designed* or elected by the president of the assembly; and this they termed *renunciari consul, prætor*, or the like; and that the last sort of the comitia only could be held without the consent or approbation of the senate, which was necessary to the convening of the other two.

COMITIALIS MORBUS, an appellation given to the EPILEPSY, by reason the comitia of ancient Rome were dissolved if any person in the assembly happened to be taken with this distemper.

COMITIUM, in Roman antiquity, a large hall in the forum, where the COMITIA were ordinarily held.

COMMA, among grammarians, a point or character marked thus (,) serving to denote a short stop, and to divide the members of a period. Different authors define and use it differently. According to F. Buffier, the comma serves to distinguish the members of a period, in each of which is a verb and the nominative case of the verb: thus, "That so many people are pleased with trifles, is owing to a weakness of mind, which makes them love things easy to be comprehended." Besides this, the comma is used to distinguish, in the same manner of a period, several nouns-substantive, or nouns-adjective, or verbs not united by a conjunction: thus, "Virtue, wit, knowledge, are the chief advantages of a man:" or, "A man never becomes learned without studying constantly, methodically, with a gust, application, &c." If those words are united in the same phrase with a conjunction, the comma is omitted: thus, "the imagination and the judgment do not always agree."

The ingenious author of the tract *De ratione interpungendi*, printed with Vossius's *Element. Rhetor.* Lond. 1724, lays down the use of a comma to be, to distinguish the simple members of a period or sentence; i. e. such as only consist of one subject, and one definite verb. But this rule does not go throughout; the

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same author instancing many particular cases not yet included herein, where yet the comma is advisable. See PUNCTUATION.

It is a general rule that a comma ought not to come between a nominative and a verb, or an adjective and substantive, when these are not otherwise disjoined: thus, in the sentence, *God ruleth with infinite wisdom*, a comma between *God* and *ruleth*, or between *infinite* and *wisdom*, would be absurd. But to this exceptions may occur; as when not a single word, but a sentence, happens to be the nominative: thus, in the example first above given, where the sentence *that so many people are pleased with trifles*, forms the nominative to the verb *is*, a comma at *trifles* is proper, both for the sake of perspicuity, and as coinciding with a slight natural pause.

COMMA, in *Mus.* See INTERVAL.

COMMANDINUS, FREDERIC, born at Urbino in Italy, and descended from a very noble family, in the 16th century. To a vast skill in the mathematics, he had added a great knowledge in the Greek tongue, by which he was well qualified to translate the Greek mathematicians into Latin: accordingly he translated and published several, which no writer till then had attempted; as Archimedes, Apollonius, Euclid, &c.

COMMANDRY, a kind of benefice or fixed revenue belonging to a military order, and conferred on ancient knights who had done considerable services to the order.

There are strict or regular commandries, obtained in order, and by merit; there are others of grace and favour, conferred at the pleasure of the grand master; there are also commandries for the religious, in the orders of St Bernard and St Anthony. The kings of France have converted several of the hospitals for lepers into commandries of the order of St Lazarus.

The commandries of Malta are of different kinds; for as the order consists of knights, chaplains, and brothers-servitors, there are peculiar commandries or revenues attached to each. The knight to whom one of these benefices or commandries is given is called *commander*, which agrees pretty nearly with the præpositus set over the monks in places at a distance from the monastery, whose administration was called *obedientia*; because depending entirely upon the abbot who gave him his commission. Thus it is with the simple commanders of Malta, who are rather farmers of the order than beneficiaries; paying a certain tribute or rent, called *responsio*, to the common treasury of the order.

COMMELINA. See BOTANY *Index*.

COMMEMORATION, in a general sense, the remembrance of any person or thing, or the doing any thing to the honour of a person's memory, or in remembrance of any past event. Thus, the eucharist is a commemoration of the sufferings of Jesus Christ.

COMMENDAM, in the ecclesiastical law, the trust or administration of the revenues of a benefice, given either to a layman, to hold by way of depositum for six months, in order to repairs, &c. or to an ecclesiastic or beneficed person, to perform the pastoral duties thereof, till once the benefice is provided with a regular incumbent.

Qq

Anciently

Comma
||
Commenda.

Commenda-
tus.

Anciently the administration of vacant bishoprics belonged to the nearest neighbouring bishop; which is still practised between the archbishopric of Lyons and the bishopric of Autun: on this account they were called *commendatory bishops*.

This custom appears to be very ancient. St Athanasius says of himself, according to Nicephorus, that there had been given him *in commendam*, i. e. in administration, another church besides that of Alexandria whereof he was stated bishop.

The care of churches, it seems, which had no pastor, was committed to a bishop, till they were provided with an ordinary: the register of Pope Gregory I. is full of these commissions, or commendams, granted during the absence or sickness of a bishop, or the vacancy of the see.

Some say, that Pope Leo IV. first established the modern commendams, in favour of ecclesiastics who had been expelled their benefices by the Saracens; to whom the administration of the vacant churches was committed for a time, in expectation of their being restored; though St Gregory is said to have used the same while the Lombards desolated Italy.

In a little time the practice of commendams was exceedingly abused; and the revenues of monasteries given to laymen for their subsistence. The bishops also procured several benefices, or even bishoprics, *in commendam*, which served as a pretext for holding them all without directly violating the canons. Part of the abuse has been retrenched; but the use of commendams is still retained as an expedient to take off the incompatibility of the person by the nature of the benefice.

When a parson is made bishop, his parsonage becomes vacant; but if the king give him power he may still hold it *in commendam*.

COMMENDATUS, one who lives under the protection of a great man. *Commendati homines*, were persons who, by voluntary homage, put themselves

under the protection of any superior lord: for ancient homage was either *predial*, due for some tenure; or *personal*, which was by compulsion, as a sign of necessary subjection; or voluntary, with a desire of protection; and those who, by voluntary homage, put themselves under the protection of any man of power, were sometimes called *homines ejus commendati*, as often occurs in Doomsday. *Commendati dimidii* were those who depended on two several lords, and paid one half of their homage to each; and *sub-commendati* were like under-tenants under the command of persons that were themselves under the command of some superior lord: also there were *dimidii sub-commendati*, who bore a double relation to such depending lords. This phrase seems to be still in use in the usual compliment, "Commend me to such a friend," &c. which is to let him know, "I am his humble servant."

COMMENSURABLE, among geometricians, an appellation given to such quantities as are measured by one and the same common measure.

COMMENSURABLE Numbers, whether integers or fractions, are such as can be measured or divided by some other number without any remainder; such are 12 and 18, as being measured by 6 and 3.

COMMENSURABLE in Power, is said of right lines, when their squares are measured by one and the same space or superficies.

COMMENSURABLE Surds, those that being reduced to their least terms, become true figurative quantities of their kind; and are therefore as a rational quantity to a rational one.

COMMENTARY, or COMMENT, in matters of literature, an illustration of the difficult or obscure passages of an author.

COMMENTARY, or *Commentaries*, likewise denotes a kind of history, or memoirs of certain transactions, wherein the author had a considerable hand: such are the Commentaries of Cæsar.

Commensurable,
Commentary.

C O M M E R C E,

IS an operation by which the wealth, or work, either of individuals or of societies, may be exchanged by a set of men called *merchants*, for an equivalent, proper for supplying every want, without any interruption to industry, or any check upon consumption.

CHAP. I. HISTORY of COMMERCE.

§ 1. General History.

It is a point as yet undecided by the learned, to what nation the invention and first use of commerce belonged; some attribute it to one people, some to another, for reasons that are too long to be discussed here. But it seems most probable that the inhabitants of Arabia were those that first made long voyages. It must be allowed, that no country was so happily situated for this purpose as that which they inhabited, being a peninsula washed on three sides by three famous seas, the Arabian, Indian, and Persian. It is also certain, that it was very early inhabited; and the

first notice we have of any considerable trade refers it to the Ishmaelites, who were settled in the hither part of Arabia. To them Joseph was sold by his brethren, when they were going down with their camels to Egypt with spicery, balm, and myrrh. It may seem strange to infer from hence, that commerce was already practised by this nation, since mention is here made of camels, or a caravan, which certainly implies an inland trade: and it must be likewise allowed, that balm and myrrh were the commodities of their country. But whence had they the spicery? Or how came Arabia to be so famous in ancient times for spices? Or whence proceeded that mistake of many great authors of antiquity, that spices actually grew there? Most certainly, because these people dealt in them; and that they dealt in them the first of any nation that we know of, appears from this very instance. Strabo and many other good authors assure us, that in succeeding times they were very great traders: they tell us particularly what ports they had; what prodigious magazines they kept of the richest kinds

History. kinds of goods; what wonderful wealth they obtained; in what prodigious magnificence they lived, and into what excesses they fell in respect to their expences for carving, building, and statues. All this shows that they were very great traders; and it also shows, that they traded to the East Indies; for from thence only they could have their spices, their rich gums, their sweet-scented woods, and their ivory, all which it is expressly said they had in the greatest abundance. This therefore proves, that they had an extensive and flourishing commerce; and that they had it earlier than any other nation, seems evident from their dealing at that time in spices. Besides, there is much less difficulty in supposing that they first discovered the route to the Indies, than if we ascribe that discovery to any other nation; for in the first place they lay nearest, and in the next they lay most conveniently; to which we may add, thirdly, that as the situation of their country naturally inclined them to navigation, so by the help of the monsoons they might make regular voyages to and from the Indies with great facility; nor is it at all unlikely that this discovery might be at first owing to chance, and to some of their vessels being blown by a strong gale to the opposite coast, from whence they might take the courage to return, by observing the regularity of the winds at certain seasons. All these reasons taken together seem to favour this opinion, that commerce flourished first among them; and as to its consequences in making them rich and happy, there is no dispute about them.

We find in the records of antiquity no nation celebrated more early for carrying all parts to perfection than the inhabitants of Egypt: and it is certain also, that no art was there cultivated more early, with more assiduity, or with greater success, than trade. It appears from the foregoing instance, that the richest commodities were carried there by land; and it is no less certain, that the most valuable manufactures were invented and brought to perfection there many ages before they were thought of in other countries; for, as the learned Dr Warburton very justly observes, at the time that Joseph came into Egypt, the people were not only possessed of all the conveniences of life, but were remarkable also for their magnificence, their politeness, and even for their luxury; which argues, that traffic had been of long standing amongst them. To say the truth, the great advantages derived from their country's lying along the Red Sea, and the many benefits that accrued to them from the Nile, which they very emphatically called *The River*, or *The River of Egypt*, and of which they knew how to make all the uses that can be imagined, gave them an opportunity of carrying their inland trade not only to a greater height than in any country at that time, but even higher than it has been carried anywhere, China only excepted; and some people have thought it no trivial argument to prove the descent of the Chinese from the Egyptians, that they have exactly the same sort of genius, and with wonderful industry and care have drawn so many cuts and canals, that their country is almost in every part of it navigable. It was by such methods, by a wise and well-regulated government, and by promoting a spirit of industry amongst the people, that the ancient Egyptians became so numerous, so rich, so powerful; and had

History. their country, for large cities, magnificent structures, and perpetual abundance, became the glory and wonder of the old world.

The Phœnicians, though they possessed only a narrow slip of the coast of Asia, and were surrounded by nations so powerful and so warlike that they were never able to extend themselves on that side, became famous, by erecting the first naval power that makes any figure in history, and for the raising of which they took the most prudent and effectual measures. In order to this, they not only availed themselves of all the creeks, harbours, and ports, which nature had bestowed very liberally on their narrow territory, but improved them in such a manner, that they were no less remarkable for their strength than considerable for their conveniency; and so attentive were they to whatever might contribute to the increase of their power, that they were not more admired for the vast advantages they derived from their commerce, than they were formidable by their fleets and armies. They were likewise celebrated by antiquity as the inventors of arithmetic and astronomy; and in the last mentioned science they must have been very considerable proficients, since they had the courage to undertake long voyages at a time when no other nation (the Arabians and Egyptians excepted) durst venture farther than their own coasts. By these arts Tyre and Sidon became the most famous marts in the universe, and were resorted to by all their neighbours, and even by people at a considerable distance, as the great storehouses of the world. We learn from the Scriptures how advantageous their friendship and alliance became to the two great kings of Israel, David and Solomon; and we see, by the application of the latter for architects and artists to Hiram king of Tyre, to what a prodigious height they had carried manufactures of every kind.

It is very certain that Solomon made use of their assistance in equipping his fleets at Elath and Eziongeber; and it is very probable that they put him upon acquiring those ports, and gave him the first hints of the amazing advantages that might be derived from the possession of them, and from the commerce he might from thence be able to carry on. These ports were most commodiously situated on the Arabian gulf; and from thence his vessels, manned chiefly by Phœnicians, sailed to Ophir and Tharsis, wherever those places were. Some writers will needs have them to be Mexico and Peru, which is certainly a wild and extravagant supposition; others believe that we are to look for Ophir on the coast of Africa, and Tharsis in Spain; but the most probable opinion is, that they were both seated in the East Indies. By this adventurous navigation he brought into his country curiosities not only unseen, but unheard of before, and riches in such abundance, that, as the Scripture finely expresses it, "He made silver in Jerusalem, as stones, and cedar-trees as sycamores that grow in the plains." The metaphor is very bold and emphatical; but when we consider that it is recorded in this History, that the return of one voyage only to Ophir produced 450 talents of gold, which makes 51,328 pounds of our Troy weight, about 2,463,744l. sterling, we cannot doubt of the immense profit that accrued from this commerce. It is also observable that the queen of

History.

Sheba, or Saba, which lies in that part of Arabia before mentioned, surpris'd at the reports that were spread of the magnificence of this prince, made a journey to his court on purpose to satisfy herself, whether fame had not exaggerated the fact; and from the presents she made him of 120 talents of gold (656,640*l.*), of spices in great abundance, and precious stones, we may discern the true reason of her curiosity, which proceeded from an opinion that no country could be so rich as her own. And there is another circumstance very remarkable, and which seems strongly to fortify what we have advanced in the beginning of this section; it is added, "neither were there any such spices as the queen of Sheba gave to King Solomon;" which seems to intimate, that the Arabians had penetrated farther into the Indies than even the fleets of this famous prince, and brought from thence other spices (perhaps nutmegs and cloves) than had ever been seen before. It was by his wisdom, and by his steady application to the arts of peace, all of which mutually support each other, as they are all driven on by the wheel of commerce, which supplies every want, and converts every superfluity into merchandise, that this monarch raised his subjects to a condition much superior to that of any of their neighbours, and rendered the land of Israel, while he governed it, the glory and wonder of the East. He made great acquisitions without making wars; and his successor, by making wars, lost those acquisitions. It was his policy to keep all his people employed; and, by employing them, he provided equally for the extension of their happiness, and his own power; but the following kings pursued other measures, and other consequences attended them. The trade of Judea sunk almost as suddenly as it rose, and in process of time they lost those ports on the Red Sea, upon which their Indian commerce depended.

The whole trade of the universe became then, as it were, the patrimony of the Phœnicians and the Egyptians. The latter monopolized that of the Indies, and, together with her corn and manufactures, brought such a prodigious balance of wealth continually into the country, as enabled the ancient monarchs of Egypt to compass all those memorable works that in spite of time and barbarous conquerors remain the monuments of their wisdom and power, and are like to remain so as long as the world subsists. The Phœnicians drew from Egypt a great part of those rich commodities and valuable manufactures which they exported into all the countries between their own and the Mediterranean sea; they drew likewise a vast resort to their own cities, even from countries at a great distance; and we need only look into the prophets Isaiah and Ezekiel in order to be convinced that these governments, founded on trade, were infinitely more glorious and more stable than those that were erected by force. All this we find likewise confirmed by profane histories; and by comparing these, it is evident, that the industry of the inhabitants of this small country triumphed over all obstacles, procured the greatest plenty in a barren soil, and immense riches, where, without industry, there must have been the greatest indigence. It is true, that Old Tyre was destroyed by Nebuchadnezzar, but not till she had flourished for ages; and even then she fell with dig-

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nity, and after a resistance that ruined the army of the great conqueror of Asia. Out of the ashes of this proud city the great spirit of its inhabitants produced a phoenix, little, if at all, inferior in beauty to its parent. New Tyre was situated on an island; and though her bounds were very narrow, yet she became quickly the mistress of the sea, and held that supreme dominion till subdued by Alexander the Great, whom no power could resist. The struggle she made, however, though unsuccessful, was great, and very much to the honour of her inhabitants: it must be owned, that the Greek hero found it more difficult to master this single place, than to overcome the whole power of Persia.

The views of the Macedonian prince were beyond comparison more extensive than his conquests; and whoever considers Alexander's plan of power, and enters into it thoroughly, will think him more a politician than he was a conqueror. He framed in his own mind an idea of universal monarchy, which it was indeed impossible to accomplish; but the very notion of it does him far greater honour than all his victories. He thought of placing his capital in Arabia; and of disposing things in such a manner, as to have commanded the most remote parts of the Indies, at the same time that he maintained a connexion with the most distant countries in Europe. He was for making use of force to acquire, but he very well knew, that commerce only could preserve, an empire, that was to have no other limits than those which nature had assigned the world. He desired to be master of all; but at the same time he was willing to be a wife and gracious master, and to place his happiness in that of his people, or rather in making all the nations of the earth but one people. A vast, an extravagant, an impracticable scheme it was, of which he lived not long enough to draw the outlines; but the sample he left in his new city of Alexandria sufficiently shows how just and how correct his notions were, and how true a judgment he had formed of what might be effected by those methods upon which he depended. That city, which he might be said to design with his own hand, and which was built, as it were, under his eye, became in succeeding times all that he expected, the glory of Egypt, and the centre of commerce for several ages.

While Tyre was in the height of her glory, and had no rival in the empire of the sea, she founded her noble colony of Carthage on the coast of Africa. The situation of the city was everywhere admirable, whether considered in the light of a capital, of a strong fortress, or of a commodious port. It was equally distant from all the extremities of the Mediterranean sea, had a very fine country behind it, and was not in the neighbourhood of any power capable of restraining its commerce or its growth. It is almost inexpressible how soon its inhabitants became not only numerous and wealthy, but potent and formidable. By degrees they extended themselves on all sides, conquered the best part of Spain, and erected there a new Carthage; the islands of Sicily and Sardinia, or at least the best part of them, submitted likewise to their yoke. Their conquests, however, were inconsiderable in extent, when compared with their navigation. On one side they stretched as far westward as Britain; and the

History. the Scilly islands, which are now so inconsiderable, were to them an Indies, the route to which they used the utmost industry to conceal. On the other hand, they discovered a great part of the coast of Africa, the Canary islands; and some there are who believe they first found the way to America. While they confined themselves to trade, and the arts which belonged thereto, their power was continually increasing; but when industry gave way to luxury, and a spirit of ambition banished their old maxims of frugality and labour, their acquisitions remained at a stand. The Romans began to grow jealous of their naval power, which it cost them two obstinate wars of 40 years continuance to humble. When she was at length destroyed, her very ruins were majestic; for at the beginning of the third fatal Punic war, this city contained 700,000 inhabitants alone, and had 300 cities in Africa under her dominion. Such was the empire of Carthage, raised entirely by commerce: and to which, if she had been content to have applied herself with the same steadiness in her highest prosperity as in her early beginnings, there is no doubt she had preserved her freedom much longer than she did; for as economy, diligence, and good faith, are the pillars of a commercial state; so when these are once shaken, it is not only natural that she should decline, but also unavoidable.

The Ptolemies, who were the successors of Alexander in Egypt, entered deeply into that hero's scheme, and reaped the benefit of his wife's establishment. Ptolemy Philadelphus, by encouraging trade, made his subjects immensely rich, and himself inexpressibly powerful. We are told by an ancient author, that he had 120 galleys of war of an enormous size, and upwards of 400 other vessels, small and great. This would appear incredible, if other wonders were not related of him, which seem to explain and confirm these. He raised a new city on the coast of the Red sea; he was at an immense expence in opening harbours, constructing quays, in raising inns at proper distances on the road, and in cutting a canal from sea to sea. A prince who comprehended the importance of commerce to a degree that induced him to dare such expences as these, might have what treasures, what armies, what fleets he pleased. In his time, Alexandria appeared in pomp and splendor. She owed her birth to Alexander; but it was Ptolemy, who caught a double portion of his master's spirit, which raised her to that magnificence that ages could not deface. We may guess at what she was in her glory, by what we are told was the produce of her customs, which fell little short of two millions of our money annually; and yet we cannot suppose that Ptolemy, who understood trade so well, would cramp it by high duties, or extravagant impositions. When the revenue of the prince from a single port was so great, what must have been the riches of his subjects!

But what shows us Alexandria in the highest point of light, is the credit she maintained after Egypt sunk from an empire into a province. The Romans themselves were struck with the majesty of her appearance; and though till then they had little regarded traffic, yet they were not long before they comprehended the advantages of such a port, and such a mart as Alexandria; they confirmed her privileges, they pro-

History. tected her inhabitants, they took every measure possible to preserve her commerce; and this with so good an effect, that she actually preserved it longer than Rome herself could preserve her power. She followed, indeed, the fortune of the empire, and became at last dependent upon Constantinople, when its founder removed thither the capital of the empire; and his successor found means to transfer also a part of the trade of Alexandria to the same place. Yet this city continued still to hold up her head, and though she sunk under the barbarous power of the Arabs, yet they grew polished by degrees; by degrees she recovered somewhat of her ancient pre-eminence; and though she never rose to any thing like her former lustre, yet she remained the centre of what little trade there was in the world; which is more than can be said of almost any place that has fallen under the Mohammedan power.

When the Roman empire was overrun by barbarians, and arts and sciences sunk with that power which had cultivated and protected them, commerce also visibly declined; or, to speak with greater propriety, was overwhelmed and lost. When that irruption of various nations had driven the Roman policy out of the greatest part of Europe, some straggling people, either forced by necessity, or led by inclination, took shelter in a few straggling islands that lay near the coast of Italy, and which would never have been thought worth inhabiting in a time of peace. This was in the 6th century; and at their first fixing there they had certainly nothing more in view than living in a tolerable state of freedom, and acquiring a subsistence as well as they could. These islands being divided from each other by narrow channels, and those channels so incumbered by shallows that it was impossible for strangers to navigate them, these refugees found themselves tolerably safe; and uniting amongst themselves for the sake of improving their condition, and augmenting their security, they became in the 8th century a well-settled government, and assumed the form of a republic.

Simple and mean as this relation may appear, yet it is a plain and true account of the rise, progress, and establishment of the famous and potent republic of Venice. Her beginnings were indeed weak and slow; but when the foundation was once well laid, her growth was quick, and the increase of her power amazing. She extended her commerce on all sides; and taking advantage of the barbarous maxims of the Mohammedan monarchies, she drew to herself the profits of the Indian trade, and might, in some sense, be said to make Egypt a province, and the Saracens her subjects. By this means her traffic swelled beyond conception; she became the common mart of all nations; her naval power arrived at a prodigious height; and, making use of every favourable conjuncture, she stretched her conquest not only over the adjacent terra firma of Italy, but through the islands of the Archipelago, so as to be at once mistress of the sea, of many fair and fruitful countries, and of part of the great city of Constantinople itself. But ambition, and the desire of lording it over her neighbours, brought upon her those evils which first produced a decay of trade, and then a declension of power. General histories indeed ascribe this to the league of Cambray, when

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when all the great powers in Europe combined against this republic; and in truth, from that period the sinking of her power is truly dated; but the Venetian writers very justly observe, that though this effect followed the league, yet there was another more latent, but at the same time a more effectual cause, which was, the falling off of their commerce; and they have ever since been more indebted to their wisdom than their power; to the prudent concealing of their own weakness, and taking advantage of the errors of their enemies, than to any other cause, for their keeping up that part which they still bear, and which had been lost long ago by any other nation but themselves.

At the same time that Venice rose, as it were, out of the sea, another republic was erected on the coast of Italy. There could not well be a worse situation than the narrow, marshy, unprofitable, and unwholesome islands in the Adriatic, except the rocky, barren, and inhospitable shores of Liguria; and yet as commerce raised Venice the Rich on the one, so she erected Genoa the Proud on the other. In spite of ambitious and warlike neighbours, in spite of a confined and unproducing country, and, which were still greater impediments, in spite of perpetual factions and successive revolutions, the trade of Genoa made her rich and great. Her merchants traded to all countries, and throve by carrying the commodities of the one to the other. Her fleets became formidable; and, besides the adjacent island of Corsica, she made larger and important conquests. She fixed a colony at Caffa, and was for some time in possession of the coasts on both sides of the Black sea. That emulation which is natural to neighbouring nations, and that jealousy which rises from the pursuit of the same mistress, commerce, begat continual wars between these rival republics; which, after many obstinate and bloody battles, were at last terminated in favour of Venice, by that famous victory of Chiozzo gained by her doge Andrew Contarini, from which time Genoa never pretended to be mistress of the sea. These quarrels were fatal to both; but what proved more immediately destructive to the Genoese, was their avarice, which induced them to abandon the fair profits of trade for the sake of that vile method of acquiring wealth by usury. All Italy is now subject to France.

But we must now look to another part of the world. In the middle age of the German empire, that is, about the middle of the 13th century, there was formed a confederacy of many maritime cities, or at least of cities not far from the sea. This confederacy solely regarded commerce, which they endeavoured to promote and extend, by interesting therein a great number of persons, and endeavouring to profit by their different views and different lights. Though the cities of Germany held the principal rank in the Teutonic Hanse, they did not however forbear associating many other cities, as well in France as in England and in the Low Countries; the whole, however, without hurting the authority, without prejudice to the rights, of the sovereign on whom they depended. This confederacy had its laws, its ordinances, and its judgments, which were observed with the same respect as the maritime code of the Rhodians, who passing for the ablest seamen in all antiquity, their constitutions were

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History. observed by the Greeks and Romans. The Teutonic Hanse grew in a short time to so high a rank in power and authority by the immense riches it acquired, that princes themselves rendered it a sincere homage from principles of esteem and admiration. Those of the north principally had frequent occasion for their credit, and borrowed of them considerable sums. The grand masters of the Teutonic order, who were at that time sovereigns of Livonia, declared themselves conservators of the rights and privileges of the Hanse: all succeeded, not only to, but beyond their wishes; and Germany, charmed with their progress, looked on them with the same eyes as a curious gardener does on certain rare plants, though not of his own raising and culture. The kings of France and England granted also various privileges to the Teutonic confederacy; they exempted their vessels in case of shipwreck from all demands whatsoever from the admiralty, or from private persons; they forbade any disturbance to their navigation at all times, and even when France was at war with the emperor, or the princes of the north. In fine, during the course of those unhappy wars which were styled *Croisades*, the Hanse was signally consulted, and gave always plentiful succours in money and in ships to the Christians oppressed by infidels. It is astonishing, that cities at so great a distance from each other, subject to different kings, sometimes in open war, but always jealous of their rights, should be able to confederate and live together in so strict an union. But when this union had rendered them very rich and powerful, it cannot seem at all strange, that on the one hand they grew arrogant and overbearing, took upon them not only to treat with sovereigns on the foot of equality, but even to make war with them, and more than once with success. It will, on the other hand, appear still less strange, that such behaviour as this awakened various princes to a more particular view of the dangers that such a league might produce, and the advantages that would naturally flow to their respective states, by recovering their trade thus made over, at least in some part to others, entirely to themselves; and these, in few words, were the causes of the gradual declension of the Hanseatic alliance, which is now totally dissolved, although the cities of Lubeck, Hamburg, and Bremen, maintain sufficient marks of that splendor and dignity with which this confederacy was once adorned.

We must now turn our eyes to Portugal and Spain, where in the space of about 50 years there happened a train of events which gradually led on to such discoveries as changed the whole face of affairs in the commercial world, and gave to the knowledge of later ages what for some thousand years had been kept secret from all mankind; we mean a perfect and distinct notion of that terraqueous globe which they inhabit. The kingdom of Portugal was small, but well cultivated, very populous, and blessed with a variety of good ports; all which, however, had stood them in little stead, if they had not had a succession of wise princes, who, instead of involving themselves in war with their neighbours to gratify their ambition, endeavoured to extend the happiness and wealth of their subjects, and consequently their own power, in the softer and more successful method of protecting arts and sciences, encouraging

History. encouraging industry, and favouring trade. This, with the convenient situation of their country, in the beginning of the 15th century, prompted some lively spirits to attempt discoveries; and these, countenanced by a heroic young prince, pushed on their endeavours with such success, that step by step the coast of Africa was surveyed as far as the Cape of Good Hope, to which they gave that name. The point they had in view was a new route to the East Indies, which Vasquez de Gama happily discovered; and in a short space of time Portugal, from one of the least considerable, grew to be one of the richest powers in Europe, gained prodigious dominions in Asia and Africa, and raised a naval power superior to any thing that had been seen for many ages before.

See Columbus (Christopher.)

But while this was doing, Christopher Columbus, a Genoese of great capacity, though of almost unknown original, who had been bred to the sea from his youth, and who had carefully studied what others made a trade, formed in his mind the amazing project of counteracting experience, and sailing to the Indies by a western course. He offered this project to the Portuguese, by whom it was considered and rejected as a chimera. He proposed it afterwards to other states, but with no better fortune; and at last owed the discovery of the New World to the high spirit of a heroine, the famous Isabella queen of Castile, who almost at her own expence, and with very little countenance from her husband, who yet was styled *Ferdinand the Wise*, furnished the adventurous Columbus with that poor squadron, with which at once, in spite of all the difficulties that the envy of his officers, and the obstinacy of his mutinous crew, threw in his way, he perfected his design, and laid open a new Indies, though in reality he aimed at the discovery of the old. Neither was this noble effort of his matchless understanding defeated; for after his decease, Ferdinand Magellan, a Portuguese, proposed to the emperor Charles V. the discovery of a passage to the spice islands by the South seas, which was what Columbus aimed at; and though Magellan lived not to return, yet in one voyage the discovery was perfected. It is inconceivable almost how many and how great benefits accrued to Europe from these discoveries; of which, however, it is certain, that the Portuguese made a very indifferent, and the Spaniards a much worse, use; the former making slaves of, and the latter rooting out, the natives. This, as it was a most ungrateful return to divine Providence for so high a blessing; so it might have been easily foreseen it would prove, as experience has shown it did prove, highly prejudicial to their own interests, by depopulating very fine countries, which have been thereby turned into deserts; and though on their first discovery infinite treasures were returned from them, which were coined in the mints of Spain; yet by an obstinate pursuit of this false policy, the Spanish islands in the West Indies are now brought so low as to be scarce worth keeping. The consequences that naturally followed on the discovery of a passage by the Cape of Good Hope, and of a fourth part of the globe in the western hemisphere, were, as it has been already hinted, the cause of an entire change in the state of Europe, and produced, not only in Portugal and Spain, but in most other nations, a desire of visiting these remote parts, of

establishing colonies and manufactures; of exporting and importing commodities, and of raising, settling, and protecting new manufactures. By this means, as the reader cannot but perceive, not only particular nations brought about signal advantages to themselves, but Europe in general received a lasting and invaluable benefit; for its potentates made themselves formidable, and even terrible, in those distant parts of the earth, where their fame had hardly reached before. It is however true, that this has not been carried on as high as it might have been; for though there was room enough for every nation to have had its share, and though it might be demonstrated that the good of the whole would have contributed sufficiently to the profit of every state, the subjects of which had engaged in this traffic; yet, instead of prosecuting so natural and so equitable a measure, they have taken a quite contrary course; and by decrying, attacking, and destroying each other, have very much lessened that prodigious reverence which the Asiatics, Africans, and Americans, at first had for the inhabitants of Europe.

The naval power of the Portuguese received an incurable wound by falling under the power of the Spaniards; and though human policy would have suggested, that this alone must have raised the latter to the monopoly of commerce, and the universal dominion of the sea; yet the very pursuit of a design so visibly detrimental to the interest of mankind, proved very quickly their ruin also. For the Spaniards, from the natural haughtiness of their temper, misled by the boundless ambition of their princes, and endeavouring to become the lords of Europe, forced other nations in their own defence to make a much quicker progress in navigation than otherwise they could have done. For the English and Dutch, who till this time seemed blind to the advantages of their situation, had their eyes opened by the injuries they received; and by degrees the passion of revenge inspired them with designs that possibly public spirit would never have excited. In short, the pains taken by Spain to keep all the riches that flowed from these discoveries to herself, and the dangerous, detestable, and destructive purposes to which she applied the immense wealth that flowed in upon her from them, produced effects directly opposite to those which she proposed, and made her enemies rich, great, powerful, and happy, in proportion as her commerce dwindled away, and as her naval power sunk and crumbled to pieces, merely by an improper display, an ill-managed exertion, and a wrong application of it.

It was from hence that the inhabitants of the Seven Provinces, whom her oppression had made poor, and her severities driven mad, became first free, then potent, and by degrees rich. Their distresses taught them the necessity of establishing a moderate and equal government; the mildness of that government, and the blessings which it procured to its subjects, raised their number, and elevated their hopes. The consequences became quickly visible, and in a short time amazing both to friends and enemies; every fishing village improved into a trading-town; their little towns grew up into large and magnificent cities; their inland boroughs were filled with manufactures; and in less than half a century the distressed States of Holland

History.

History.

Holland became high and mighty; nay, in spite of the danger and expences which attended a war made all that time against a superior force, these people, surrounded with enemies, loaded with taxes, exposed to personal service, and to a thousand other disadvantages, grew up to such a strength as not only made the Spaniards despair of reducing them any more under their dominion, but inclined them to wish, and at last forced them to solicit, their friendship.

This, at least as far as either ancient or modern histories inform us, was the quickest and strongest of all the productions of commerce that the world has ever seen. For it is beyond dispute that the republic of the United Provinces owes her freedom, her power, and her wealth, entirely to industry and trade. The greatest part of the country is far from being fertile; and what is so, produces not enough to suffice the tenth part of the inhabitants for the tenth part of the year: the climate is rather tolerable than wholesome; and its havens are rather advantageous from the difficulty of entering them, than from their commodiousness in any other respect. Of native commodities they have few or none; timber and maritime stores are entirely wanting; their country cannot boast so much as of a coal-mine; and yet these provinces, upon which nature has bestowed so little, in consequence of an extensive trade, are enriched with all things. Their store-houses are full of corn, even when the harvest in corn-countries fails; there is no commodity, however bulky, or scarce and hard to come at, which may not be had from their magazines. The shipping of Holland is prodigious; and to see the quantities of naval stores with which their yards and ports abound, astonishes those who are unacquainted with the vigour of that cause which produces this abundance. But above all, the populousness of this country is the greatest miracle. That men should resort to a Canaan, and desire to live in a land flowing with milk and honey, is nothing strange; but that they should make it their choice to force nature, to raise palaces, lay out gardens, dig canals, plant woods, and ransack all the quarters of the earth for fruit and flowers, to produce an artificial paradise in a dead plain, or upon an ungrateful heath in the midst of fogs and standing lakes, would in so critical an age as this pass for a fable, if the country did not lie so near us as to put the truth of it out of question. It is now subject to France.

§ 2. *British History.*

We may easily conceive, that foreign commerce by the natives of this island must have been a work of time; for men think first of necessities, then of conveniences, and last of superfluities. Those who came originally from the continent might have better notions of things; but as it must be presumed that either fear or indigence drove them hither, so it is easy to apprehend that succeeding generations must for some time sink much below their ancestors in their notions of the commodities of life; and, deriving their manners from their circumstances, become quite another sort of people. But those on the opposite continent, knowing that this island was inhabited, and having the use, though in ever so imperfect a degree, of vessels, and of foreign traffic, came over hither, and bartered their goods for the raw commodities of the Bri-

tons, till by degrees perhaps they taught the latter to make some improvement in those slight leather and wicker boats, which they used for plying their own rivers, and creeping along their coasts, till at last they ventured themselves over to Gaul, and entered upon some kind of correspondence with their neighbours. All this is so deducible from the laws of nature, that we might have conceived thus much by the light of reason, if we had not the commentaries of Cæsar to guide us, and to strengthen by the authority of history, the facts that might have been found out by the force of rational conjecture.

Things were precisely in this situation when the Romans invaded Britain; and there is no doubt that our ancestors falling under the power of that empire, and under its power at a time when, with respect to arts and sciences, it was in a most flourishing condition, was a great advantage to them; and though from their love of civil liberty, which, when under the direction of reason, is the most natural and laudable of all passions, they made a long and vigorous, and in some sense a noble and glorious, resistance; yet by degrees they caught the manners and customs of their conquerors, and grew content to be happy rather than free. With learning and politeness the Romans introduced foreign commerce; and according to the nature of their policy, as they made high roads through the island, established colonies in proper places, and fixed standing camps, which were a kind of fortresses, where they thought proper; so they were no less careful with regard to marts or emporiums for the conveniency of traders, and of which what they found was uncertain; but that they left many, is without question; and amongst the rest London, which is not more famous for her present extensive trade, than venerable for her unrecorded antiquity.

When the Romans unwillingly left Britain, and the Britons as unwillingly made way for the Saxons, a new deluge of barbarity overflowed this island: almost all the improvements of our civilized conquerors were effaced; and upon the establishment as it were of a new people, things were all to begin again. This necessarily took up a great deal of time; and before they were in any tolerable posture, the Saxons found themselves distressed by fresh swarms of barbarians. Yet there still remain some evidences of their having been acquainted with, inclined to, and, if their circumstances would have permitted, most certainly would have entered upon and carried foreign commerce to a great height. We have authentic testimonies, that Alfred the Great formed projects of vast discoveries to the North, as he actually sent persons of great prudence and abilities into the East; and the curiosities which they brought home were for many ages preserved in the treasury of the church of Salisbury.

As for the Danes, they were not long our masters; but as they became so by a maritime force, and as their countrymen had established themselves not only on the opposite shore of France, but in other parts of Europe, it is reasonable to believe that they held some correspondence with them from thence; and that, if their dominion had lasted longer, this might have been better regulated, and productive of many advantages. But they had soon to do with their brethren

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CHAP. II. PRINCIPLES of COMMERCE.

SECT. I. *Origin of Trade.*

History. in another way; for the Normans, men of the same race, but better established in another country, dispossessed them here; and partly under colour of right, partly by force, erected that monarchy, which, not without various alterations and changes, subsists even to our times, and to the subsistence of which, with the help of those changes and alterations, we owe that happy constitution under which we live; that universal improvement which adorns the face of our country; that domestic trade which nourishes so numerous a people, by plentifully rewarding their industry; and that extensive commerce which is at once the source of our wealth and the support of our liberty.

It cannot be expected, that in a work like this we should attempt to trace the progress of trade through every reign; show how it was encouraged and protected, or discountenanced and checked; what occasions were luckily seized, or what opportunities unfortunately lost. It may be sufficient for us, after what has been already said, to observe, that the opinion commonly entertained, of our having little or no trade before the reign of Queen Elizabeth, is very far from being well founded.

In fact, the reign of that princess was great and glorious in whatever light we consider it; but it was most so in this, that, under Providence, it became great and glorious by the wisdom and prudence of the queen and her ministers. The English nation never was in so desperate a condition as at her accession. The crown was in debt, the treasury empty, the nation involved in a foreign war directly against her own interests, her coasts naked; in a word, without credit abroad, and without concord at home, no settled religion, the great men split into factions, and the common people distracted and dejected. Sad circumstances these! and yet from hence arose the grandeur of that reign, and the establishment of our commerce. The queen found herself obliged to act with great caution, to derive assistance from every quarter, to employ it faithfully, and to promote to the utmost of her power the welfare of her subjects, whom nothing but the public-spiritedness of her government could enable to grow rich enough to support the necessary expences of the crown. It was this gave a popular turn to her councils. She encouraged her subjects to arm against the Spaniards, that they might be accustomed to the sea, and acquire that knowledge in navigation, with which, till then, they had been unacquainted. She passed many laws for the public good, erected several companies, and saw that those companies pursued the ends for which they were erected; in short, she did every thing that could be expected, during the whole course of her reign, to excite and encourage industry at home, and to enable us to make a proper figure abroad. In a word, she furnished us with stock and credit, put us upon improving our commodities and manufactures, brought the art of ship-building amongst us, filled our ports with able seamen, showed a just respect to English merchants, reduced Ireland so as to render it beneficial to Britain, and approved our sending colonies into America; and thus the seeds of British wealth were sown in her time, though the harvest was reaped in the days of her successors. See the articles COALERY, COLONY, FISHERIES, MANUFACTURES, SHIPPING, and TRADE.

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THE most simple of all trade is that which is carried on by bartering the necessary articles of subsistence. If we suppose the earth free to the first possessor, this person who cultivates it will first draw from it his food, and the surplus will be the object of barter: he will give this in exchange to any one who will supply his other wants. This naturally supposes both a surplus quantity of food produced by labour, and also free hands; for he who makes a trade of agriculture cannot supply himself with all other necessaries, as well as food; and he who makes a trade of supplying the farmers with such necessaries, in exchange for his surplus of food, cannot be employed in producing that food. The more the necessities of man increase, the more free hands are required to supply them; and the more free hands are required, the more surplus food must be produced by additional labour, to supply their demand.

This is the least complex kind of trade, and may be carried on to a greater or less extent, in different countries, according to the different degrees of the wants to be supplied. In a country where there is no money, nor any thing equivalent to it, the wants of mankind will be confined to few objects; to wit, the removing the inconveniences of hunger, thirst, cold, heat, danger, and the like. A free man, who, by his industry, can procure all the comforts of a simple life, will enjoy his rest, and work no more; and, in general, all increase of work will cease, so soon as the demand for the purposes mentioned comes to be satisfied. There is a plain reason for this. When the free hands have procured, by their labour, wherewithal to supply their wants, their ambition is satisfied: so soon as the husbandmen have produced the necessary surplus for relieving theirs, they work no more. Here then is a natural stop put to industry, consequently to bartering.

The next thing to be examined is, how bartering grows into trade, properly so called, and understood, according to the definition given of it above; how trade comes to be extended among men; how manufactures, more ornamental than useful, come to be established; and how men come to submit to labour, in order to acquire what is not absolutely necessary for them.

This, in a free society, is chiefly owing to the introduction of money, and a taste for superfluities in those who possess it.

In ancient times, money was not wanting; but the taste for superfluities not being in proportion to it, the specie was locked up. This was the case in Europe four hundred years ago. A new taste for superfluity has drawn, perhaps, more money into circulation, from our own treasures, than from the mines of the new world. The poor opinion we entertain of the riches of our forefathers, is founded upon the modern way of estimating wealth, by the quantity of coin in circulation, from which we conclude, that the greatest part of the specie now in our hands must have come from America.

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Principles. It is more, therefore, through the taste of superfluity, than in consequence of the quantity of coin, that trade comes to be established; and it is only in consequence of trade that we see industry carry things in our days to so high a pitch of refinement and delicacy. Let us illustrate this, by comparing together the different operations of barter, sale, and commerce.

When reciprocal wants are supplied by barter, there is not the smallest occasion for money: this is the most simple of all combinations.

When wants are multiplied, bartering becomes more difficult: upon this money is introduced. This is the common price of all things: it is a proper equivalent in the hands of those who want, perfectly calculated to supply the occasions of those who, by industry, can relieve them. This operation of buying and selling is a little more complex than the former; but still we have here no idea of trade, because we have not introduced the merchant, by whose industry it is carried on.

Let this third person be introduced, and the whole operation becomes clear. What before we called *wants*, is here represented by the consumer; what we called *industry*, by the manufacturer; what we called *money*, by the merchant. The merchant here represents the money, by substituting credit in its place; and as the money was invented to facilitate barter, so the merchant, with his credit, is a new refinement upon the use of money. This renders it still more effectual in performing the operations of buying and selling. This operation is trade: it relieves both parties of the whole trouble of transportation, and adjusting wants to wants, or wants to money; the merchant represents by turns both the consumer, the manufacturer, and the money. To the consumer he appears as the whole body of manufacturers; to the manufacturers as the whole body of consumers; and to the one and the other class his credit supplies the use of money. This is sufficient at present for an illustration. We now return to the simple operations of money in the hands of the two contracting parties, the buyer and the seller, in order to show how men come to submit to labour in order to acquire superfluities.

So soon as money is introduced into a country, it becomes an universal object of want to all the inhabitants.

The consequence is, that the free hands of the state, who before stopt working, because all their wants were provided for, having this new object of ambition before their eyes, endeavour, by refinements upon their labour, to remove the smaller inconveniences which result from a simplicity of manners. People, who formerly knew but one sort of clothing for all seasons, willingly part with a little money to procure for themselves different sorts of apparel properly adapted to summer and winter, which the ingenuity of manufacturers, and their desire of getting money, may have suggested to their invention.

Indeed these refinements seem more generally owing to the industry and invention of the manufacturers (who by their ingenuity daily contrive means of softening or relieving inconveniences which mankind seldom perceive to be such, till the way of removing

them is contrived), than to the taste for luxury in the rich, who, to indulge their ease, engage the poor to become industrious.

Let any man make an experiment of this nature upon himself, by entering into the first shop. He will nowhere so quickly discover his wants as there. Every thing he sees appears either necessary, or at least highly convenient; and he begins to wonder how he could have been so long without that which the ingenuity of the workman alone had invented, in order that from the novelty it might incite his desire; for perhaps when it is bought, he will never once think of it more, nor ever apply it to the use for which at first it appeared so necessary.

Here then is a reason why mankind labour though not in want. They become desirous of possessing the very instruments of luxury, which their avarice or ambition prompted them to invent for the use of others.

What has been said represents trade in its infancy, or rather the materials with which that great fabric is built.

We have formed an idea of the wants of mankind multiplied even to luxury, and abundantly supplied by the employment of all the free hands set apart for that purpose. But if we suppose the workman himself disposing of his work, and purchasing with it food from the farmer, clothes from the clothier; and, in general, seeking for the supply of every want from the hands of the person directly employed for the purpose of relieving it; this will not convey an idea of trade according to our definition.

Trade and commerce are an abbreviation of this long process; a scheme invented and set on foot by merchants, from a principle of gain, supported and extended among men, from a principle of general utility to every individual, rich or poor; to every society, great or small.

Instead of a pin-maker exchanging his pins with 50 different persons, for whose labour he has occasion, he sells all to the merchant for money or for credit; and as occasion offers, he purchases all his wants, either directly from those who supply them, or from other merchants, who deal with manufacturers in the same way his merchant dealt with him.

Another advantage of trade is, that industrious people in one part of the country may supply customers in another, though distant. They may establish themselves in the most commodious places for their respective business, and help one another reciprocally, without making the distant parts of the country suffer for want of their labour. They are likewise exposed to no avocation from their work, by seeking for customers.

Trade produces many excellent advantages; it marks out to the manufacturers when their branch is under or overstocked with hands. If it is understocked, they will find more demand than they can answer; if it is overstocked, the sale will be slow.

Intelligent men, in every profession, will easily discover when these appearances are accidental, and when they proceed from the real principles of trade.

Posts, and correspondence by letters, are a consequence of trade; by the means of which merchants are regularly informed of every augmentation or diminution

Principles. nation of industry in every branch, in every part of the country. From this knowledge they regulate the prices they offer; and as they are many, they serve as a check upon one another, from the principles of competition.

From the current prices, the manufacturers are as well informed, as if they kept the correspondence themselves: the statesman feels perfectly where hands are wanting, and young people destined to industry, obey, in a manner, the call of the public, and fall naturally in to supply the demand.

Two great assistances to merchants, especially in the infancy of trade, are public markets for collecting the work of small dealers, and large undertakings in the manufacturing way by private hands. By these means the merchants come at the knowledge of the quantity of work in the market, as on the other hand the manufacturers learn, by the sale of the goods, the extent of the demand for them. These two things being justly known, the price of goods is easily fixed.

Public sales serve to correct the small inconveniences which proceed from the operations of trade. A set of manufacturers got all together into one town, and entirely taken up with their industry, are thereby as well informed of the rate of the market as if every one of them carried thither his work; and upon the arrival of the merchant, who readily takes it off their hands, he has not the least advantage over them from his knowledge of the state of demand. This man both buys and sells in what is called *wholesale*; and from him retailers purchase, who distribute the goods to every consumer throughout the country. These last buy from wholesale merchants in every branch, that proportion of every kind of merchandise which is suitable to the demand of their borough, city, or province.

Thus all inconveniences are prevented, at some additional cost to the consumer, who must naturally reimburse the whole expence. The distance of the manufacturer, the obscurity of his dwelling, the caprice in selling his work, are quite removed; the retailer has all in his shop, and the public buys at a current price.

§ 2. *How the price of Goods is determined by Trade.*

In the price of goods, two things must be considered as really existing, and quite different from one another; to wit, the real value of the commodity, and the profit upon alienation.

I. The first thing to be known of any manufacture, when it comes to be sold, is how much of it a person can perform in a day, a week, a month, according to the nature of the work, which may require more or less time to bring it to perfection. In making such estimates, regard is to be had only to what, upon an average, a workman of the country in general may perform, without supposing him the best or the worst in his profession, or having any peculiar advantage or disadvantage as to the place where he works.

Hence the reason why some people prosper by their industry, and others not; why some manufactures flourish in one place and not in another.

II. The second thing to be known is, the value of the workman's subsistence, and necessary expence, both for supplying his personal wants and providing the

Principles. instruments belonging to his profession, which must be taken upon an average as above, except when the nature of the work requires the presence of the workman in the place of consumption; for although some trades, and almost every manufacture, may be carried on in places at a distance, and therefore may fall under one general regulation as to prices; yet others there are, which, by their nature, require the presence of the workman in the place of consumption; and in that case the prices must be regulated by circumstances relative to every particular place.

III. The third and last thing to be known, is the value of the materials, that is, the first matter employed by the workman; and if the object of his industry be the manufacture of another, the same process of inquiry must be gone through with regard to the first as the second; and thus the most complex manufactures may be at last reduced to the greatest simplicity.

These three articles being known, the price of manufacture is determined. It cannot be lower than the amount of all the three, that is, than the real value; whatever it is higher, is the manufacturer's profit. This will ever be in proportion to demand, and therefore will fluctuate according to circumstances.

Hence appears the necessity of a great demand, in order to promote flourishing manufactures.

By the extensive dealings of merchants, and their constant application to the study of the balance of work and demand, all the above circumstances are known to them, and are made known to the industrious, who regulate their living and expence according to their certain profit.

Employ a workman in a country where there is little trade or industry, he proportions his price always to the urgency of your want, or your capacity to pay; but seldom to his own labour. Employ another in a country of trade, he will not impose upon you, unless perhaps you be a stranger, which supposes your being ignorant of the value; but employ the same workman in a work not usual in the country, consequently not demanded, and therefore not regulated as to the value, he will proportion his price as in the first supposition.

We may therefore conclude, from what has been said, that in a country where trade has been established, manufactures must flourish, from the ready sale, the regulated price of work, and the certain profit resulting from industry. Let us next inquire into the consequences of such a situation.

§ 3. *How foreign Trade opens to an industrious People, and the consequences of it to the Merchants who set it on foot.*

The first consequence of the situation described in the preceding section is, that wants are easily supplied for the adequate value of the thing wanted.

The next consequence is, the opening of foreign trade, under its two denominations of passive and active. Strangers and people of distant countries, finding the difficulty of having their wants supplied at home, and the ease of having them supplied from this country, immediately have recourse to it. This is passive trade. The active is when merchants, who have executed this plan at home with success, begin to trans-

^{Principles.} port the labour of their countrymen into other regions, which either produce, or are capable of producing such articles of consumption, proper to be manufactured, as are most demanded at home; and consequently will meet with the readiest sale, and fetch the largest profits.

Here then is the opening of foreign trade, under its two denominations of active and passive.

What then are the consequences of this new commerce to our merchants, who have left their homes in quest of gain abroad?

The first is, that, arriving in any new country, they find themselves in the same situation with regard to the inhabitants, as the workman in the country of no trade, with regard to those who employ him; that is, they proportion the price of their goods to the eagerness of acquiring, or the capacity of paying, in the inhabitants, but never to their real value.

The first profits then, upon this trade, must be very considerable; and the demand from such a country will be *high* or *low*, *great* or *small*, according to the spirit, not the real wants of the people; for these in all countries must first be supplied by the inhabitants themselves, before they cease to labour.

If the people of this not-trading country be abundantly furnished with commodities useful to the traders, they will easily part with them, at first, for the instruments of luxury and ease; but the great profit of the traders will insensibly increase the demand for the productions of their new correspondents: this will have the effect of producing a competition between themselves, and thereby throwing the demand on their side. This is perpetually a disadvantage in traffic; the most unpolished nations in the world quickly perceive the effects of it, and are taught to profit by the discovery, in spite of the address of those who are the most expert in commerce.

The traders will therefore be very fond of falling upon every method and contrivance to inspire this people with a taste of refinement and delicacy. Abundance of fine presents, consisting of every instrument of luxury and superfluity, the best adapted to the genius of the people, will be given to the prince and leading men among them. Workmen will even be employed at home, to study the taste of the strangers, and to captivate their desires by every possible means. The more eager they are of presents, the more lavish the traders will be in bestowing and diversifying them. It is an animal put up to fatten; the more he eats, the sooner he is fit for slaughter. When their taste for superfluity is fully formed, when the relish for their former simplicity is sophisticated, poisoned, and obliterated, then they are surely in the fetters of the traders, and the deeper they go, the less possibility there is of being extricated. The presents then will die away, having served their purpose; and if afterwards they are found to be continued, it will probably be to support the competition against other nations, who will incline to share of the profits.

If, on the contrary, this not-trading nation does not abound with commodities useful to the traders, these will make little account of trading with them, whatever their turn may be; but, if we suppose this country inhabited by a laborious people, who, having ta-

ken a taste for refinement from the traders, apply ^{Principles.} themselves to agriculture, in order to produce articles of subsistence, they will solicit the merchants to give them part of their manufactures in exchange for those; and this trade will undoubtedly have the effect of multiplying numbers in the trading nation. But if food cannot be furnished, nor any other branch of production found out to support the correspondence, the taste for refinement will soon die away, and trade will stop in this quarter.

Had it not been for the furs in those countries adjacent to Hudson's Bay, and in Canada, the Europeans never would have thought of supplying instruments of luxury to those nations; and if the inhabitants of those regions had not taken a taste for the instruments of luxury furnished to them by the Europeans, they never would have become so indefatigable nor so dexterous hunters. At the same time we are not to suppose that ever these Americans would have come to Europe in quest of our manufactures. It is, therefore, owing to our merchants, that these nations are become in any degree fond of refinement; and this taste, in all probability, will not soon exceed the proportion of the productions of their country. From these beginnings of foreign trade it is easy to trace its increase.

One step towards this, is the establishing correspondences in foreign countries; and these are more or less necessary in proportion as the country where they are established is more or less polished, or acquainted with trade. They supply the want of posts, and point out to the merchants what proportion the productions of the country bear to the demand of the inhabitants for manufactures. This communicates an idea of commerce to the not-trading nation, and they insensibly begin to fix a determined value upon their own productions, which perhaps bore no determined value at all before.

Let us trace a little the progress of this refinement in the savages, in order to show how it has the effect of throwing the demand upon the traders, and of creating a competition among them, for the productions of the new country.

Experience shows, that, in a new discovered country, merchants constantly find some article or other of its productions, which runs out to a great account in commerce; and we see that the longer such a trade subsists, and the more the inhabitants take a taste for European manufactures, the more their own productions rise in their value, and the less profit is made by trading with them, even in cases where the trade is carried on by companies; which is a very wise institution for one reason, that it cuts off a competition between our merchants.

This is the best means of keeping prices low in favour of the nation; however, it may work a contrary effect with respect to individuals who must buy from these monopolies.

When companies are not established, and when trade is open, our merchants, by their eagerness to profit by the new trade, betray the secrets of it; they enter into competition for the purchase of the foreign produce; and this raises prices, and favours the commerce of the most ignorant savages.

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§ 4. *Consequences of the Introduction of a passive foreign Trade among a People who live in Simplicity and Idleness.*

We now suppose the arrival of traders, all in one interest, with instruments of luxury and refinement, at a port in a country of great simplicity of manners, abundantly provided by nature with great advantages for commerce, and peopled by a nation capable of adopting a taste for superfluities.

The first thing the merchants do is, to expose their goods, and point out the advantages of many things, either agreeable or useful to mankind in general, such as wines, spirits, instruments of agriculture, arms and ammunition for hunting, nets for fishing, manufactures for clothing, and the like. The advantages of these are presently perceived, and such commodities are eagerly sought after.

The natives, on their side, produce what they most esteem, generally something superfluous or ornamental. The traders, after examining all circumstances, determine the object of their demand, giving the least quantity possible in return for this superfluity, in order to impress the inhabitants with a high notion of the value of their own commodities; but as this parsimony may do more hurt than good to their interest, they are very generous in making presents, from the principles mentioned above.

When the exchange is completed, and the traders depart, regret is commonly mutual; the one and the other are sorry that the superfluities of the country fall short. A return is promised by the traders, and assurances are given by the natives of a better provision another time.

What are the first consequences of this revolution?

It is evident, that, in order to supply an equivalent for this new want, more hands must be set to work than formerly. And it is evident also, that this augmentation of industry will not essentially increase numbers: Why? Because the produce of the industry is, in this case, intended to be exported. But, if we can find out any additional consumption at home, even implied by this new trade, it will have the effect of augmenting numbers. An example will make this plain.

Let us suppose the superfluity of this country to be the skins of wild beasts, not proper for food; the manufacture sought for, brandy. The brandy is sold for furs. He who has furs, or he who can spare time to hunt for them, will drink brandy in proportion; but there is no reason to conclude from this simple operation, that one man more in the country must necessarily be fed, or that any augmentation of agriculture must of consequence ensue from this new traffic.

But let us throw in a circumstance which may imply an additional consumption at home, and then examine the consequences.

A poor creature who has no equivalent to offer for food, who is miserable, and ready to perish for want of subsistence, goes a hunting, and kills a wolf; he comes to a farmer with the skin, and says, You are well fed, but you have no brandy; if you will give me a loaf, I will give you this skin, which the strangers are so fond of, and they will give you brandy. But, says the farmer, I have no more bread than what is sufficient for my own family. As for that, replies

the other, I will come and dig in your ground, and you and I will settle our account as to the small quantity I desire of you. The bargain is made; the poor fellow gets his loaf, and lives at least; perhaps he marries, and the farmer gets a dram. But had it not been for this dram, that is, this new want, which was purchased by the industry of this poor fellow, by what argument could he have induced the farmer to part with a loaf?

Here the sentiment of charity is excluded. This alone is a principle of multiplication; but as true it is, on the other hand, that could the poor fellow have got bread by begging, he would not probably have gone a hunting.

Here then it appears, that the very dawning of trade, in the most unpolished countries, implies a multiplication. This is sufficient to point out the first step, and to connect the subject of our present inquiries with what has been already discussed in relation to other circumstances.

So soon as all the furs are disposed of, and a taste for superfluity is introduced, both the traders and the natives will be equally interested in the advancement of industry in this country. Many new objects of profit for the first will be discovered, which the proper employment of the inhabitants, in reaping the natural advantages of their soil and climate, will make effectual. The traders will therefore endeavour to set on foot many branches of industry among the savages, and the allurements of brandy, arms, and clothing, will animate these in the pursuit of them.

When once this revolution is brought about; when those who formerly lived in simplicity become industrious; matters put on a new face.

That is to say, we now find two trading nations instead of one, with this difference, however, that as hitherto we have supposed the merchants all in one interest, the compound demand, that is, the competition of the buyers, has been, and must still continue on the side of the natives. This is a great prejudice to their interest: but as it is not supposed sufficient to check their industry, nor to restrain their consumption of the manufactures, let us here examine a little more particularly the consequences of the principle of demand in such a situation; for although we allow, that it can never change sides, yet it may admit of different modifications, and produce different effects, as we shall presently perceive.

The merchants we suppose all in one interest, consequently there can be no competition among them; no check can be put upon their raising their prices, as long as the prices they demand are complied with. So soon as they are raised to the full extent of the abilities of the natives, or of their inclination to buy, the merchants have the choice of three things, which are all perfectly in their option; and the preference to be given to the one or the other, depends entirely upon themselves, and upon the circumstances we are going to point out.

First, they may support their *high* demand; that is, not lower their price, which will preserve a high estimation of the manufactures in the opinion of the inhabitants, and render the profits upon their trade the greatest possible. This part they may possibly take, if they perceive the natives doubling their dili-

gence, in order to become able, in time, to purchase considerable cargoes at a high value; from which supposition is inferred a strong disposition in the people to become luxurious, since nothing but want of ability prevents them from complying with the highest demand: but still another circumstance must concur, to engage the merchants not to lower their price. The great proportion of the goods they seek for in return, must be found in the hands of a few. This will be the case if slavery be established; for then there must be many poor and few rich; and they are commonly the rich consumers who proportion the price they offer, rather to their desires, than to the value of the thing.

The second thing which may be done is, to encourage a great demand; that is, to lower their prices. This will sink the value of the manufactures in the opinion of the inhabitants, and render profits less in proportion, although indeed, upon the voyage, the profits may be greater.

This part they will take, if they perceive the inhabitants do not incline to consume great quantities of the merchandize at a high value, either for want of abilities or inclination; and also, if the profits upon the trade depend upon a large consumption, as is the case in merchandize of a low value, and suited chiefly to the occasions of the lower sort. Such motives of expediency will be sufficient to make them relinquish a high demand, and prefer a great one; and the more, when there is a likelihood that the consumption of low-priced goods in the beginning may beget a taste for others of a higher value, and thus extend in general the taste of superfluity.

A third part to be taken is the least politic, and perhaps the most familiar. It is to profit by the competition between the buyers, and encourage the rising of demand as long as possible; when this comes to a stop, to make a kind of auction, by first bringing down the prices to the level of the highest bidders, and so to descend by degrees, in proportion as demand sinks. Thus we may say with propriety, that demand commonly becomes great, in proportion as prices sink. By this operation, the traders will profit as much as possible, and sell off as much of their goods as the profits will permit.

But this plan, in a new discovered country, is not politic, as it both discovers a covetousness and a want of faith in the merchants, and also throws open the secrets of their trade to those who ought to be kept ignorant of them.

Let us next suppose, that the large profits of our merchants shall be discovered by others, who arrive at the same ports in a separate interest, and who enter into no combination which might prevent the natural effects of competition.

Let the states of demand among the natives be supposed the same as formerly, both as to height and greatness, in consequence of the operation of the different principles, which might have induced our merchants to follow one or other of the plans we have been describing: we must, however, still suppose, that they have been careful to preserve considerable profits upon every branch.

If we suppose the inhabitants to have increased in numbers, wealth, and taste for superfluity, since the

last voyage, demand will be found rather on the rising hand. Upon the arrival of the merchants in competition with the former, both will offer to sale; but if both stand to the same prices, it is very natural to suppose, that the former dealers will obtain a preference; as *cæteris paribus* it is always an advantage to know and to be known. The last comers, therefore, have no other way left to counterbalance this advantage, but to lower their prices.

This is a new phenomenon: here the fall of prices is not voluntary as formerly, nor consented to from expediency; not owing to a failure of demand, but to the influence of a new principle of commerce, to wit, a double competition, which we shall now examine.

§ 5. Of double Competition.

When competition is much stronger on one side of the contract than on the other, it is called *simple*. This is the species of competition which is implied in the term *high demand*, or when it is said that *demand raises prices*.

Double competition is, when, in a certain degree, it takes place on both sides of the contract at once, or vibrates alternately from one to the other. This is what restrains prices to the adequate value of merchandize.

The great difficulty is to distinguish clearly between the principles of *demand* and those of *competition*: here then follow the principal differences between the two, relatively to the effects they produce severally in the mercantile contract of buying and selling, which we here express shortly by the word *contract*.

Simple demand is what brings the quantity of a commodity to market. Many demand, who do not buy; many offer, who do not sell. This demand is called *great* or *small*; it is said to increase, to augment, to swell; and is expressed by these and other synonymous terms, which mark an augmentation or diminution of quantity. In this species, two people never demand the same thing, but a part of the same thing, or things quite alike.

Compound demand is the principle which raises prices, and can never make them sink; because in this case more than one demands the very same thing. It is solely applicable to the buyers, in relation to the price they offer. This demand is called *high* or *low*, and is said to rise, to fall, to mount, to sink, and is expressed by these and other synonymous terms.

Simple competition, when between buyers, is the same as *compound* or *high demand*; but differs from it in so far, as this may equally take place among sellers, which compound demand cannot; and then it works a contrary effect: it makes prices sink, and is synonymous with low demand; it is this competition which overturns the balance of work and demand.

Double competition is what is understood to take place in almost every operation of trade; it is this which prevents their excessive rise of prices; it is this which prevents their excessive fall. While double competition prevails, the balance is perfect, trade and industry flourish.

The capital distinction, therefore, between the terms *demand* and *competition* is, that *demand* is constantly relative to the buyers; and when money is not the price,

Principles. as in barter, then it is relative to that side upon which the greatest competition is found.

We therefore say, with regard to prices, demand is high or low. With regard to the quantity of merchandise, demand is great or small. With regard to competition, it is always called great or small, strong or weak.

Competition is, with equal propriety, applicable to both parties in the contract. A competition among buyers is a proper expression; a competition among sellers, who have the merchandise, is fully as easily understood, though it be not quite so striking, for reasons which an example will make plain.

You come to a fair, where you find a great variety of every kind of merchandise, in the possession of different merchants. These by offering their goods to sale, constitute a tacit competition; every one of them wishes to sell in preference to another, and at the same time with the best advantage to himself.

The buyer begins, by cheapening at every shop. The first price asked marks the covetousness of the seller; the first price offered, the avarice of the buyer. From this operation competition begins to work its effects on both sides, and so becomes double. The principles which influence this operation are now to be deduced.

It is impossible to suppose the same degree of eagerness, either to buy or sell, among several merchants; because the degree of eagerness is exactly in proportion to their views of profit; and as these must necessarily be influenced and regulated by different circumstances, that buyer, who has the best prospect of selling again with profit, obliges him, whose prospect is not so good, to content himself with less; and that seller, who has bought to the best advantage, obliges him, who has paid dearer for the merchandise, to moderate his desire of gain.

It is from these principles that competition among buyers and sellers must originate. This is what confines the fluctuation of prices within limits which are compatible with the reasonable profits of both buyers and sellers; for we must constantly suppose the whole operation of buying and selling to be performed by merchants; the buyer cannot be supposed to give so high a price as that which he expects to receive when he distributes to the consumers, nor can the seller be supposed to accept of a lower than that which he paid to the manufacturer. This competition is properly called double, because of the difficulty to determine upon which side it stands; the same merchant may have it in his favour upon certain articles, and against him upon others; it is continually in vibration, and the arrival of every post may less or more pull down the heavy scale.

In every transaction between merchants, the profit resulting from the sale must be exactly distinguished from the value of the merchandise. The first may vary, the last never can. It is this profit alone which can be influenced by competition; and it is for that reason we find such uniformity everywhere in the prices of goods of the same quality.

The competition between sellers does not appear so striking as that between buyers; because he who offers to sale, appears only passive in the first operation; whereas the buyers present themselves one after another; they make a demand when the mer-

chandise is refused to one at a certain price; a second either offers more, or does not offer at all; but so soon as another seller finds his account in accepting the price the first had refused, then the first enters into competition, providing his profits will admit his lowering the first price; and thus competition takes place among the sellers, until the profits upon their trade prevent prices from falling lower.

In all markets this competition is varying, though insensibly, on many occasions; but in others the vibrations are very perceptible. Sometimes it is found strongest on the side of the buyers; and in proportion as this grows, the competition between the sellers diminishes. When the competition between the former has raised prices to a certain standard, it comes to a stop; then the competition changes sides, and takes place among the sellers, eager to profit by the highest price. This makes prices fall; and according as they fall, the competition among the buyers diminishes. They still wait for the lowest period. At last it comes, and then perhaps some new circumstance, by giving the balance a kick, disappoints their hopes. If therefore it ever happens, that there is but one interest upon one side of the contract, as in the example in the former section, where we supposed the sellers united, you perceive, that the rise of the price, occasioned by the competition of the buyers, and even its coming to a stop, could not possibly have the effect of producing any competition on the other side; and therefore, if prices come afterwards to sink, the fall must have proceeded from the prudential considerations of adapting the price to the faculties of those who, from the height of it, had withdrawn their demand.

From these principles of competition, the forestalling of markets is made a crime, because it diminishes the competition which ought to take place between different people, who have the same merchandise to offer to sale. The forestaller buys all up, with an intention to sell with more profit, as he has by that means taken other competitors out of his way, and appears with a single interest on one side of the contract, in the face of many competitors on the other. This person is punished by the state, because he has prevented the price of the merchandise from becoming justly proportioned to the real value; he has robbed the public and enriched himself; and in the punishment he makes restitution. Here occur two questions to be resolved, for the sake of illustration.

Can competition among buyers possibly take place, when the provision made is more than sufficient to supply the quantity demanded? On the other hand, can competition take place among the sellers, when the quantity demanded exceeds the total provision made for it?

We think it may in both cases; because in the one and the other, there is a competition implied on one side of the contract, and the very nature of this competition presupposes a possibility of its coming on the other, provided separate interests be found upon both sides. But to be more particular:

1. Experience shows, that however justly the proportion between the demand and the supply may be determined in fact, it is still next to impossible to discover it exactly, and therefore the buyers can only regulate the prices they offer, by what they may reasonably

Principles. ably expect to sell for gain. The sellers, on the other hand, can only regulate the prices they expect, by what the merchandise has cost them when brought to market. We have already shown, how, under such circumstances, the several interests of individuals affect each other, and make the balance vibrate.

2. The proportion between the supply and the demand is seldom other than *relative* among merchants, who are supposed to buy and sell, not from necessity, but from a view to profit. What we mean by *relative* is, that their demand is *great* or *small* according to prices; there may be a great demand for grain at 35s. per quarter, and no demand at all for it at 40s; that is, among merchants.

It is essential to attend to the smallest circumstance in matters of this kind. The circumstance we mean, is the difference we find in the effect of competition, when it takes place purely among merchants on both sides of the contract, and when it happens, that either the consumers mingle themselves with the merchant-buyers, or the manufacturers, that is, the furnishers, mingle themselves with the merchant-sellers. This combination we shall illustrate by the solution of another question, and then conclude with a few reflections upon the whole.

Can there be no case formed where the competition upon one side may subsist, without a possibility of its taking place on the other, although there should be separate interests upon both?

The case is hardly supposable among merchants, who buy and sell with a view to profit; but it is absolutely supposable, and that is all, when the direct consumers are the buyers; when the circumstances of one of the parties is perfectly known; and when the competition is so strong upon one side, as to prevent a possibility of its becoming double, before the whole provision is sold off, or the demand satisfied. Let us have recourse to examples.

Grain arriving in a small quantity, at a port where the inhabitants are starving, producing so great a competition among the consumers who are the buyers, that their necessity becomes evident; all the grain is generally bought up before prices can rise so high as to come to a stop; because nothing but want of money, that is, an impossibility of complying with the prices demanded by the merchants, can restrain them: but if you suppose, even here, that prices come naturally to a stop; or that, after some time, they fall lower, from prudential considerations; then there is a possibility of a competition taking place among the sellers, from the principles above deduced. If, on the contrary, the stop is not natural, but occasioned by the interposition of the magistrate, from humanity, or the like, there will be no competition, because then the principles of commerce are suspended; the sellers are restrained on one side, and they restrain the buyers on the other. Or rather indeed, it is the magistrate, or compassion, who in a manner fixes the price, and performs the office of both buyer and seller.

A better example still may be found, in a competition among sellers, where it may be so strong as to render a commodity in a manner of no value at all, as in the case of an uncommon and unexpected draught of fish, in a place of small consumption, when no preparations have been made for salting them. There

can be then no competition among the buyers, because the market cannot last, and they find themselves entirely masters, to give what price they please, being sure the sellers must accept of it, or lose their merchandise. In the first example, humanity commonly stops the activity of the principle of competition; in the other, it is stopped by a certain degree of fair dealing, which forbids the accepting of a merchandise for nothing.

In proportion therefore as the rising of prices can stop demand, or the sinking of prices can increase it, in the same proportion will competition prevent either the rise or the fall from being carried beyond a certain length; and if such a case can be put, where the rising of prices cannot stop demand, nor the lowering of prices augment it, in such cases double competition has no effect; because these circumstances unite the most separate interests of buyers and sellers in the mercantile contract; and when upon one side there is no separate interest, there can then be no competition.

From what has been said, we may form a judgment of the various degrees of competition. A book not worth a shilling, a fish of a few pounds weight, are often sold for considerable sums. The buyers here are not merchants. When an ambassador leaves a court in a hurry, things are sold for less than the half of their value; he is no merchant, and his situation is known. When, at a public market, there are found consumers, who make their provision, or manufacturers, who dispose of their goods for present subsistence; the merchants, who are respectively upon the opposite side of the contract to these, profit of their competition; and those who are respectively upon the same side with them, stand by with patience until they have finished their business. Then matters come to be carried on between merchant and merchant, and then profits may rise and fall in the proportion of quantity to demand; that is to say, if the provision is less than the demand, the competition among the demanders, or the rise of the price, will be in the compound proportion of the falling short of the commodity, and of the prospect of selling again with profit. It is this combination which regulates the competition, and keeps it within bounds. It can affect but the profits upon the transaction; the intrinsic value of the commodity stands immovable; nothing is ever sold below the real value; nothing is ever bought for more than it may probably bring. We mean in general. Whereas, so soon as consumers and needy manufacturers mingle in the operation, all proportion is lost. The competition between them is too strong for the merchants; the balance vibrates by jerks. In such markets merchants seldom appear; the principal objects there, are the fruits and productions of the earth, and articles of the first necessity for life, not manufactures strictly so called. A poor fellow often sells to purchase bread to eat; not to pay what he did eat while he was employed in the work he disposes of. The consumer often measures the value of what he is about to purchase, by the weight of his purse, and his desire to consume.

§ 6. Of what is called *Expence, Profit, and Loss.*

The term *expence*, when simply expressed, without any particular relation, is always understood to be relative

Principles. lative to money. This kind is distinguished under the three heads of *private*, *public*, and *national*.

1. *Private expence* is what a private person, or private society, lays out, either to provide articles of consumption, or something more permanent, which may be conducive to their ease, convenience, or advantage.

Thus we say, a *large domestic expence*, relative to one who spends a great income. We say, a merchant has been at *great expence* for magazines, for living, for clerks, &c. but never that he has been at any in buying goods. In the same way a manufacturer may expend for building, machines, horses, and carriages, but never for the matter he manufactures. When a thing is bought in order to be sold again, the sum employed is called money *advanced*; when it is bought not to be sold, it may be said to be *expended*.

2. *Public expence* is the employment of that money which has been contributed by individuals for the current service of the state. The contribution, or gathering it together, represents the effects of many articles of *private expence*; the laying it out when collected is *public expence*.

3. *National expence* is what is expended out of the country; this is what diminishes national wealth. The principal distinction to be here attended to is between public expence, or the laying out of public money, and national expence, which is the alienating the nation's wealth in favour of strangers. Thus the greatest public expence imaginable may be no national expence; because the money may remain at home. On the other hand, the smallest public, or even private expence, may be a national expence; because the money may go abroad.

Profit and loss is divided into *positive*, *relative*, and *compound*. *Positive profit* implies no loss to any body; it results from an augmentation of labour, industry, or ingenuity, and has the effect of swelling or augmenting the public good.

Positive loss implies no profit to any body; it is what results from the cessation of the former, or of the effects resulting from it, and may be said to diminish the public good.

Relative profit is what implies a loss to somebody; it marks a vibration of the balance of wealth between parties, but implies no addition to the general stock.

Relative loss is what, on the contrary, implies a profit to somebody; it also marks a vibration of the balance, but takes nothing from the general stock.

The *compound* is easily understood; it is that species of profit and loss which is partly relative and partly positive.

§ 7. *The general consequences resulting to a trading Nation, upon the opening of an active foreign Commerce.*

A nation which remains passive in her commerce is at the mercy of those who are active, and must be greatly favoured indeed by natural advantages, or by a constant flux of gold and silver from her mines, to be able to support a correspondence not entirely hurtful to the augmentation of her wealth.

When we look upon the wide field which here opens to our view, we are perplexed with too great a variety

of objects. In one part, we see a decent and comely beginning of industry; wealth flowing gently in to recompense ingenuity; numbers both augmenting, and every one becoming daily more useful to another; agriculture proportionally extending itself; no violent revolutions; no exorbitant profits; no insolence among the rich; no excessive misery among the poor; multitudes employed in producing; great economy upon consumption; and all the instruments of luxury, daily produced by the hands of the diligent, going out of the country for the service of strangers; not remaining at home for the gratification of sensuality. At last the augmentations come insensibly to a stop. Then these rivers of wealth, which were in brisk circulation through the whole world, and which returned to this trading nation as blood returns to the heart, only to be thrown out again by new pulsations, begin to be obstructed in their course; and flowing abroad more slowly than before, come to form stagnations at home. These, impatient of restraint, soon burst out into domestic circulation. Upon this cities swell in magnificence of buildings; the face of the country is adorned with palaces, and becomes covered with groves; luxury shines triumphant in every part; inequality becomes more striking to the eye; and want and misery appear more deformed from the contrast; even fortune grows more whimsical in her inconstancy; the beggar of the other day now rides in his coach; and he who was born in a bed of state, is seen to die in a gaol, or in an alms-house. Such are the effects of great domestic circulation.

The statesman looks about with amazement; he who was wont to consider himself as the first man in the society in every respect, perceives himself, perhaps, eclipsed by the lustre of private wealth, which avoids his grasp when he attempts to seize it. This makes his government more complex and more difficult to be carried on; he must now avail himself of art and address, as well as of power and force. By the help of cajoling and intrigues he gets a little into debt; this lays a foundation for public credit, which, growing by degrees, and in its progress assuming many new forms, becomes, from the most tender beginnings, a most formidable monster, striking terror into those who cherished it in its infancy. Upon this, as upon a triumphant war-horse, the statesman gets astride; he then appears formidable anew; his head turns giddy; he is choaked with the dust he has raised; and at the moment he is ready to fall, to his utter astonishment and surprise, he finds a strong monied interest of his own creating, which, instead of swallowing him up, as he apprehended, flies to his support. Through this he gets the better of all opposition, he establishes taxes, multiplies them, mortgages his fund of subsistence; either becomes a bankrupt, and rises again from his ashes; or if he be less audacious, he stands trembling and tottering for a while on the brink of the political precipice. From the one or the other of these perilous situations, he begins to discover an endless path, which after a multitude of windings, still returns into itself, and continues an equal course through this vast labyrinth.

It is now full time to leave off rhapsody, and return to reasoning and cool inquiry, concerning the

Principles. more immediate and more general effects and revolutions produced by the opening of a foreign trade in a nation of industry.

The first and most sensible alteration will be an increase of demand for manufacturers, because by supplying the wants of strangers, the number of consumers will now be considerably augmented. What again will follow upon this, must depend upon circumstances.

If this revolution in the state of demand should prove too violent, the consequence of it will be to raise demand; if it should prove gradual, it will increase it. This distinction is well understood, and the consequence appears just; for, if the supply do not increase in proportion to the demand, a competition will ensue among the demanders; which is the common effect of such sudden revolutions. If, on the other hand, a gentle increase of demand should be accompanied with a proportional supply, the whole industrious society will grow in vigour, and in wholesome stature, without being sensible of any great advantage or inconveniency; the change of their circumstances will even be imperceptible.

The immediate effects of the violent revolution will, in this example, be flattering to some and disagreeable to others. Wealth will be found daily to augment, from the rising of prices, in many branches of industry. This will encourage the industrious classes, and the idle consumers at home will complain. We have already dwelt abundantly long upon the effect resulting from this to the lower classes of the people, in providing them with a certain means of subsistence. Let us now examine in what respect even the higher classes will be made likewise to feel the good effects of this general change, although at first they may suffer a temporary inconvenience from it.

Farmers, as has been observed, will have a greater difficulty in finding servants, who, instead of labouring the ground, will choose to turn themselves to manufactures. This we have considered in the light of purging the lands of superfluous mouths; but every consequence in this great chain of politics draws other consequences after it; and as they follow one another, things put on different faces, which affect classes differently. The purging of the land is but one of the first; here follows another.

The desertion of the hands employed in a trifling agriculture will at first, no doubt, embarrass the farmers; but in a little time every thing becomes balanced in a trading nation, because here every industrious man must advance in prosperity, in spite of all general combinations of circumstances.

In the case before us, the relative profits upon farming must soon become greater than formerly, because of this additional expence which must affect the whole class of farmers; consequently, this additional expence, instead of turning out to be a loss to either landlord or farmer, will, after some little time, turn out to the advantage of both, because the produce of the ground, being indispensably necessary to every body, must in every article increase in its value. Thus, in a short time accounts will be nearly balanced on all hands; that is to say, the same proportion of wealth will, *ceteris paribus*, continue the same among the industrious. We say among the industrious; for those

who are either idle, or even negligent, will be great *Principles* losers.

A proprietor of land, inattentive to the causes of his farmer's additional expence, may very imprudently suffer his rents to fall, instead of assisting him on a proper occasion, in order to make them afterwards rise the higher.

Those who live upon a determined income in money, and who are nowise employed in traffic, nor in any scheme of industry, will, by the augmentation of prices, be found in worse circumstances than before.

In a trading nation every man must turn his talents to account, or he will undoubtedly be left behind in this universal emulation, in which the most industrious, the most ingenious, and the most frugal, will constantly carry off the prize.

This consideration ought to be a spur to every man. The richest men in a trading nation have no security against poverty; we mean proportional poverty; for though they diminish nothing of their income, yet, by not increasing it in proportion to others, they lose their rank in wealth, and from the first class in which they stood they will slide insensibly down to a lower.

There is one consequence of an additional beneficial trade, which raises demand and increases wealth; but if we suppose no proportional augmentation of supply, it will prove at best but an airy dream which lasts for a moment; and when the gilded scene is passed away, numberless are the inconveniences which are seen to follow.

We shall now point out the natural consequences of this augmentation of wealth drawn from foreign nations, when the statesman remains inattentive to increase the supply both of food and manufactures, in proportion to the augmentation of mouths, and of the demand for the produce of industry.

In such a situation profits will daily swell, and every scheme for reducing them within the bounds of moderation, will be looked upon as a hurtful and unpopular measure: be it so; but let us examine the consequences.

We have said, that the rise of demand for manufactures naturally increases the value of work: now we must add, that under such circumstances, the augmentation of riches in a country, either not capable of improvement as to the soil, or where precautions have not been taken for facilitating a multiplication of inhabitants, by the importation of subsistence, will be productive of the most calamitous consequences.

On one side, this wealth will effectually diminish the mass of the food before produced; and on the other, will increase the number of useless consumers. The first of these circumstances will raise the demand for food; and the second will diminish the number of useful free hands, and consequently raise the price of manufactures: here are shortly the outlines of this progress.

The more rich and luxurious a people are, the more delicate they become in their manner of living; if they fed on bread formerly, they will now feed on meat; if they fed on meat, they will now feed on fowl. The same ground which feeds a hundred with bread, and a proportional quantity of animal-food, will not maintain an equal number of delicate livers.

Food

Principles. Food must then become more scarce; demand for it rises; the rich are always the strongest in the market; they consume the food, and the poor are forced to starve. Here the wide door to modern distress opens; to wit, a hurtful competition for subsistence. Farther, when a people become rich, they think less of economy; a number of useless servants are hired, to become an additional dead weight on consumption; and when their starving countrymen cannot supply the extravagance of the rich so cheaply as other nations, they either import instruments of foreign luxury, or seek to enjoy them out of their own country, and thereby make restitution of their gains.

Is it not therefore evident, that if, before things come to this pass, additional subsistence be not provided by one method or other, the number of inhabitants must diminish; although riches may daily increase by a balance of additional matter supposed to be brought into the country in consequence of the hitherto beneficial foreign trade? This is not all. We say further, that the beneficial trade will last for a time only. For the infallible consequences of the rise of prices at home will be, that those nations which at first consumed your manufactures, perceiving the gradual increase of their price, will begin to work for themselves; or finding out your rivals who can supply them cheaper, will open their doors to them. These again, perceiving the great advantages gained by your traders, will begin to supply the market; and since every thing must be cheaper in countries where we do not suppose the concurrence of all the circumstances mentioned above, these nations will supplant you, and be enriched in their turn.

Here comes a new revolution. Trade is at a stand: what then becomes of all the hands which were formerly employed in supplying the foreign demands?

Were revolutions so sudden as we are obliged to represent them, all would go to wreck; in proportion as they happen by quicker or slower degrees, the inconveniences are greater or smaller.

Prices, we have said, are made to rise by competition. If the competition of the strangers was what raised them, the distress upon the manufacturers will be in proportion to the suddenness of their deserting the market. If the competition was divided between the strangers and the home-consumers, the inconveniences which ensue will be less; because the desertion of the strangers will be in some measure made up by an increase of home-consumption which will follow upon the fall of prices. And if, in the third case, the natives have been so imprudent, as not only to support a competition with the strangers, and thereby disgust them from coming any more to market, but even to continue the competition between themselves, the whole loss sustained by the revolution will be national. Wealth will cease to augment; but the inconveniences, in place of being felt by the manufacturers, will only affect the state; these will continue in affluence, extolling the generosity of their countrymen, and despising the poverty of the strangers who had enriched them.

Domestic luxury will here prove an expedient for preserving from ruin the industrious part of a people, who in subsisting themselves had enriched their country. No change will follow in their condition; they will go

on with a painful assiduity to labour; and if the consequences of it become now hurtful to one part of the state, they must at least be allowed to be essentially necessary for the support of another.

But that luxury is no necessary concomitant of foreign trade, in a nation where the true principles of it are understood, will appear very plain, from a contrast we are now going to point out, in the example of a modern state, renowned for its commerce and frugality. The country is Holland.

A set of industrious and frugal people were assembled in a country by nature subject to many inconveniences, the removing of which necessarily employed abundance of hands. Their situation upon the continent, the power of their former masters, and the ambition of their neighbours, obliged them to keep great bodies of troops. These two articles added to the numbers of the community, without either enriching the state by their labour exported, or producing food for themselves or countrymen.

The scheme of a commonwealth was calculated to draw together the industrious; but it has been still more useful in subsisting them: the republican form of government being there greatly subdivided, vests authority sufficient in every part of it, to make suitable provision for their own subsistence; and the tie which unites them, regards only matters of public concern. Had the whole been governed by one sovereign, or by one council, this important matter never could have been effected.

It would be impossible for the most able minister that ever lived, to provide nourishment for a country so extended as France, or even as England, supposing these as fully peopled as Holland is; even although it should be admitted that a sufficient quantity of food might be found in other countries for their subsistence. The enterprise would be too great, abuses would multiply; the consequence would be, that the inhabitants would die for want. But in Holland, the case is different: every little town takes care of its own inhabitants; and this care being the object of application and profit to so many persons, is accomplished with success.

When once it is laid down as a maxim in a country, that food must of necessity be got from abroad in order to feed the inhabitants at home, the corn-trade becomes considerable, and at the same time certain, regular, and permanent. This was the case in Holland: as the inhabitants were industrious, the necessary consequence has been, a very extraordinary multiplication; and at the same time such an abundance of grain, that, instead of being in want themselves, they often supply their neighbours. There are many examples of England's being supplied with grain from thence; and, which is still more extraordinary, from the re-exportation of the very produce of its own fruitful soil.

It is therefore evident, that the only way to support industry, is to provide a supply of subsistence, constantly proportional to the demand that may be made for it. This is a precaution indispensably necessary for preventing hurtful competition. This is the particular care of the Dutch: so long as it can be effectual, their state can fear no decline; but whenever they come to be distressed in the markets, upon

Principles. which they depend for subsistence, they will sink into ruin. It is by mere dint of frugality, cheap and parsimonious living, that the navigation of this industrious people is supported. Constant employment, and an accumulation of almost imperceptible gains, fill their coffers with wealth, in spite of the large outgoings, to which their own proper nourishment yearly forces them. The large profits upon industry in other countries, which are no proof of generosity, but a fatal effect of a scanty subsistence, is far from dazzling their eyes. They seldom are found in the list of competitors at any foreign port; if they have their cargo to dispose of, they wait with pleasure in their own vessels, consuming their own provisions, and at last accept of what others have left. It may be said, that many other circumstances concur in favour of the Dutch, besides the article of subsistence. Without disputing this matter, it may be observed, that if a computation be made of the hands employed in providing subsistence, and of those who are severally taken up in supplying every other want, their numbers will be found nearly to balance one another in the most luxurious countries. From this we may conclude, that

Principles. the article of food, among the lower classes, must bear a very high proportion to all the other articles of their consumption; and therefore a diminution upon the price of subsistence, must be of infinite consequence to manufacturers who are obliged to buy it. From this consideration, let us judge of the consequence of such augmentations upon the price of grain as are familiar to us; 30 or 40 per cent. seems nothing. Now this augmentation operates upon two-thirds, at least, of the whole expence of a labouring man: let any one who lives in tolerable affluence make the application of this to himself, and examine how he would manage his affairs, if, by accidents of rains or winds, his expences were to rise 30 per cent. without a possibility of restraining them; for this is unfortunately the case with all the lower classes. From whence it may be concluded, that the keeping food cheap, and still more the preserving it at all times at an equal standard, is the fountain of the wealth of Holland; and that any hurtful competition in this article must beget a disorder which will affect the whole of the manufacturers of a state.

C O M

Commercy ||
Comminatory. COMMERCY, a handsome town of France in the duchy of Bar, with the title of a principality, and a magnificent castle. It is seated on the river Meuse, in E. Long. 5. 24. N. Lat. 48. 20.

COMMERSONIA. See BOTANY Index.

COMMINATION, an office in the liturgy of the church of England, appointed to be read on Ash-Wednesday, or the first day of Lent. It is substituted in the room of that *godly discipline in the primitive church*, by which (as the introduction to the office expresses it), "such persons, as stood convicted of notorious sins, were put to open penance, and punished in this world, that their souls might be saved in the day of the Lord; and that others, admonished by their example, might be the more afraid to offend." This discipline, in after ages, degenerated, in the church of Rome, into a formal confession of sins upon Ash Wednesday, and the empty ceremony of sprinkling ashes upon the heads of the people. Our reformers wisely rejected this ceremony, as mere shadow and show; and substituted this office in its room, which is *A denunciation of God's anger and judgment against sinners*, that the people, being apprised of God's wrath and indignation against sin, may not, through want of discipline in the church, be encouraged to follow and pursue them; but rather be moved to supply that discipline to themselves, and so as to avoid being judged and condemned at the tribunal of God.

COMMINATORY, an appellation given to whatever threatens punishment, or some penalty. Thus, in France, when an exile is enjoined not to return under pain of death, it is deemed a *comminatory* penalty; since, if he do return, it is not strictly executed; but a second injunction is laid on him, which is more

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than comminatory, and, from the day of the date thereof, imports death without remedy. Comminges ||

COMMINGES, a province of France, 45 miles in length, and 15 in breadth; bounded on the north by Gascony, on the south by Catalonia, on the east by Couslerans, and on the west by Bigorre. Its principal trade consists in cattle, mules, and corn. St Bertrand is the capital town. Commifary.

COMMINATION, denotes the breaking, or rather grinding, a body to very small particles.

COMMIRE, JOHN, a celebrated Latin poet, born at Amboise in 1625, entered into the society of the Jesuits, and taught polite literature and divinity. He died at Paris in 1702. We have a volume of his Latin poems, and a collection of his posthumous works. His odes and fables are more particularly admired.

COMMISSARY, in the ecclesiastical law, an officer of the bishop, who exercises spiritual jurisdiction in places of a diocese so far from the episcopal see, that the chancellor cannot call the people to the bishop's principal consistory court, without giving them too much inconveniency.

COMMISSARY-Court, in Scotland, a court originally constituted by the bishops for executing in their name an usurped jurisdiction; and was anciently called the *bishop's court*, *curia Christianitatis*, or *consistorial court*. This court was modelled by Queen Mary at the Reformation, and continues to this day.

COMMISSARY, in a military sense, is of different sorts.

COMMISSARY-General of the Musters, an officer appointed to muster the army, as often as the general thinks proper, in order to know the strength of each regiment

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regiment and company, to receive and inspect the muster-rolls, and to keep an exact state of the strength of the army.

COMMISSARY of Horses, an officer in the artillery, appointed to have the inspection of the artillery-horses, to see them mustered, and to send such orders as he receives from the commanding officer of the artillery, by some of the conductors of horses, of which he has a certain number for his assistants.

COMMISSARY of Provisions, an officer who has the charge of furnishing the army with provisions.

COMMISSARY of Stores, an officer in the artillery who has the charge of all the stores, for which he is accountable to the office of ordnance.

COMMISSION, in common law, the warrant or letters patent, which all persons exercising jurisdiction have to empower them to hear or determine any cause or suit; as the commission of the judges, &c.

COMMISSION of Bankruptcy, is the commission that issues from the lord chancellor, on a person's becoming a bankrupt within any of the statutes, directed to certain commissioners appointed to examine into it, and to secure the bankrupt's lands and effects for the satisfaction of his creditors. See the article BANKRUPT.

The proceedings on a commission of bankruptcy may be divided, 1. Into those which affect the bankrupt himself. 2. Into those which affect his property.

1. As to those of the former kind, there must, in the first place, be a petition to the lord chancellor by one creditor to the amount of 100l. or by two to the amount of 150l. or by three or more to the amount of 200l.; upon which he grants a commission to such discreet persons as to him shall seem good, who are then styled commissioners of bankrupt. The petitioners, to prevent malicious applications, must be bound in a security of 200l. to make the party amends, in case they do not prove him a bankrupt. And if, on the other hand, they receive any money or effects from the bankrupt, as a recompense for suing out the commission, so as to receive more than their rateable dividends of the bankrupt's estate, they forfeit not only what they shall have so received, but their whole debt. When the commission is awarded and issued, the commissioners are to meet at their own expence, and to take an oath for the due execution of their commission, and to be allowed a sum not exceeding 20s. *per diem* each, at every sitting. And no commission of bankruptcy shall abate or be void on any demise on the crown.

When the commissioners have received their commission, they are first to receive proof of the person's being a trader, and having committed some act of bankruptcy; and then to declare him bankrupt, if proved so; and to give notice thereof in the gazette, and at the same time to appoint three meetings. At one of these meetings an election must be made of assignees, or persons to whom the bankrupt's estate shall be assigned, and in whom it shall be vested for the benefit of the creditors; which assignees are chosen by the major part, in value, of the creditors who shall then have proved their debts; but may be originally appointed by the commissioners, and afterwards approved or rejected by the creditors; but no creditors shall be admitted to vote in the choice of assignees,

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whose debt, on the balance of accounts, does not amount to 10l. And at the third meeting at farthest, which must be on the 42d day after the advertisement in the gazette, the bankrupt, upon notice also personally served upon him, or left at his usual place of abode, must surrender himself personally to the commissioners, and must thenceforth in all respects conform to the directions of the statutes of bankruptcy; or, in default thereof, shall be guilty of felony without benefit of clergy, and shall suffer death, and his goods and estate shall be divided among his creditors.

In case the bankrupt absconds, or is likely to run away between the time of the commission issued and the last day of surrender, he may, by warrant from any judge or justice of the peace, be apprehended and committed to the county gaol, in order to be forthcoming to the commissioners, who are also empowered immediately to grant a warrant for seizing his goods and papers.

When the bankrupt appears, the commissioners are to examine him touching all matters relating to his trade and effects. They may also summon before them, and examine, the bankrupt's wife, and any other person whatsoever, as to all matters relating to the bankrupt's affairs: And in case any of them shall refuse to answer, or shall not answer fully, to any lawful question, or shall refuse to subscribe such their examination, the commissioners may commit them to prison without bail, till they make and sign a full answer; the commissioners specifying in their warrant of commitment the question so refused to be answered. And any gaoler, permitting such person to escape or go out of prison, shall forfeit 500l. to the creditors.

The bankrupt, upon this examination, is bound, upon pain of death, to make a full discovery of all his estate and effects as well in expectancy as possession, and how he has disposed of the same; together with all books and writings relating thereto: and is to deliver up all in his power to the commissioners (except the necessary apparel of himself, his wife, and his children); or, in case he conceals or embezzles any effects to the amount of 20l. or withholds any book or writings, with intent to defraud his creditors, he shall be guilty of felony without benefit of clergy.

After the time allowed the bankrupt for such discovery is expired, any other person voluntarily discovering any part of his estate before unknown to the assignees, shall be entitled to five per cent. out of the effects so discovered, and such farther reward as the assignees and commissioners shall think proper. And any trustee wilfully concealing the estate of any bankrupt, after the expiration of 42 days, shall forfeit 100l. and double the value of the estate concealed, to the creditors.

Hitherto every thing is in favour of the creditors; and the law seems to be pretty rigid and severe against the bankrupt; but, in case he proves honest, it makes him full amends for all this rigour and severity. For, if the bankrupt hath made an ingenuous discovery, hath conformed to the directions of the law, and hath acted in all points to the satisfaction of his creditors; and if they, or four parts in five of them in number and value (but none of them creditors for less than

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20l. will sign a certificate to that purport; the commissioners are then to authenticate such certificate under their hands and seals, and to transmit it to the lord chancellor: and he, or two judges whom he shall appoint, on oath made by the bankrupt that such certificate was obtained without fraud, may allow the same; or disallow it, upon cause shown by any of the creditors of the bankrupt.

If no cause be shown to the contrary, the certificate is allowed of course; and then the bankrupt is entitled to a decent and reasonable allowance out of his effects, for his future support and maintenance, and to put him in a way of honest industry. This allowance is also in proportion to his former good behaviour, in the early discovery of the decline of his affairs, and thereby giving his creditors a large dividend. For if his effects will not pay one half of his debts, or 10s. in the pound, he is left to the discretion of the commissioners and assignees, to have a competent sum allowed him, not exceeding 3 per cent.; but if they pay 10s. in the pound, he is to be allowed 5 per cent.; if 12s. 6d. then $7\frac{1}{2}$ per cent.; and if 15s. in the pound, then the bankrupt shall be allowed 10 per cent.; provided that such allowance do not in the first case exceed 200l. in the second 250l. and in the third 300l.

Besides this allowance, he has also an indemnity granted him, of being free and discharged for ever from all debts owing by him at the time he became a bankrupt; even though judgment shall have been obtained against him, and he lies in prison upon execution for such debts; and, for that among other purposes, all proceedings on commission of bankrupt, are, on petition, to be entered on record, as a perpetual bar against actions to be commenced upon this account: though, in general, the production of the certificate properly allowed shall be sufficient evidence of all previous proceedings. Thus the bankrupt becomes a clear man again; and, by the assistance of his allowance and his own industry, may become an useful member of the commonwealth; which is the rather to be expected, as he cannot be entitled to these benefits, but by the testimony of his creditors themselves of his honest and ingenuous disposition; and unless his failures have been owing to misfortunes, rather than to misconduct and extravagance.

2. As to the proceedings which affect the bankrupt's property.

By virtue of the statutes before mentioned, all the personal estate and effects of the bankrupt are considered as vested, by the act of bankruptcy, in the future assignees of his commissioners, whether they be goods in actual possession, or debts, contracts, and other choses in action; and the commissioners by their warrant may cause any house or tenement of the bankrupt to be broken open, in order to enter upon and seize the same. And when the assignees are chosen or approved by the creditors, the commissioners are to assign every thing over to them; and the property of every part of the estate is thereby as fully vested in them as it was in the bankrupt himself, and they have the same remedies to recover it.

The property vested in the assignees is the whole that the bankrupt had in himself, at the time he committed the first act of bankruptcy, or that has been

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vested in him since, before his debts are satisfied or agreed for. Therefore it is usually said, that once a bankrupt, and always a bankrupt: by which is meant, that a plain direct act of bankruptcy once committed, cannot be purged, or explained away, by any subsequent conduct, as a dubious equivocal act may be; but that, if a commission is afterward awarded, the commission and the property of the assignees shall have a relation, or reference, back to the first and original act of bankruptcy. Inasmuch that all transactions of the bankrupt are from that time absolutely null and void, either with regard to the alienation of his property, or the receipt of his debts from such as are privy to his bankruptcy; for they are no longer his property, or his debts, but those of the future assignees. And if an execution be sued out, but not served and executed on the bankrupt's effects till after the act of bankruptcy, it is void, as against the assignees. But the king is not bound by this fictitious relation, nor is within the statutes of bankrupts; for if, after the act of bankruptcy committed, and before the assignment of his effects, an extent issues for the debt of the crown, the goods are bound thereby. In France this doctrine of relation is carried to a very great length: for there, every act of a merchant, for ten days precedent to the act of bankruptcy, is presumed to be fraudulent, and is therefore void. But with us the law stands upon a more reasonable footing; for as these acts of bankruptcy may sometimes be secret to all but a few, and it would be prejudicial to trade to carry this notion to its utmost length, it is provided by stat. 19 Geo. II. c. 32. that no money paid by a bankrupt to a *bona fide*, or real, creditor, in a course of trade, even after an act of bankruptcy done, shall be liable to be refunded. Nor by stat. 1 Jac. I. c. 15. shall any debtor of a bankrupt that pays him his debt without knowing of his bankruptcy, be liable to account for it again. The intention of this relative power being only to reach fraudulent transactions, and not to distress the fair trader.

The assignees may pursue any legal method of recovering this property so vested in them by their own authority; but cannot commence a suit in equity, nor compound any debts owing to the bankrupt, nor refer any matters to arbitration, without the consent of the creditors, or the major part of them in value, at a meeting to be held in pursuance of notice in the gazette.

When they have got in all the effects they can reasonably hope for, and reduced them to ready money, the assignees must, within 12 months after the commission issued, give 21 days notice to the creditors of a meeting for a dividend or distribution; at which time they must produce their accounts, and verify them upon oath, if required. And then the commissioners shall direct a dividend to be made, at so much in the pound, to all creditors who have before proved, or shall then prove, their debts. This dividend must be made equally, and in a rateable proportion, to all the creditors, according to the quantity of their debts; no regard being had to the quality of them. Mortgages, indeed, for which the creditor has a real security in his own hands, are entirely safe; for the commission of bankrupt reaches only the equity of redemption. So are all personal debts, where the creditor

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ditor has a chattel in his hands, or a pledge or pawn, for the payment, or has taken the debtor's lands or goods in execution. And, upon the equity of the stat. 8 An. c. 14. (which directs, that upon all executions of goods being on any premises demised to a tenant, one year's rent and no more shall, if due, be paid to the landlord) it hath also been held, that under a commission of bankrupt, which is in the nature of a statute execution, the landlord shall be allowed his arrears of rent to the same amount, in preference to other creditors, even though he hath neglected to distress while the goods remained on the premises; which he is otherwise entitled to do for his entire rent, be the quantum what it may. But otherwise judgments and recognizances (both which are debts of record, and therefore at other times have a priority), and also bonds and obligations by deed or special instrument (which are called deeds by specialty, and are usually the next in order), these are all put on a level with debts by mere simple contract, and all paid *pari passu*. Nay, so far is this matter carried, that, by the express provision of the statutes, debts not due at the time of the dividend made, as bonds or notes of hand, payable at a future day, shall be paid equally with the rest, allowing a discount or drawback in proportion. And insurances, and obligations upon bottomry or respondentia, *bona fide*, made by the bankrupt, though forfeited after the commission is awarded, shall be looked upon in the same light as debts contracted before any act of bankruptcy.

Within 18 months after the commission issued, a second and final dividend shall be made, unless all the effects were exhausted by the first. And if any surplus remains, after paying every creditor his full debt, it shall be restored to the bankrupt. This is a case which sometimes happens to men in trade, who involuntarily, or at least unwarily, commit acts of bankruptcy, by absconding and the like, while their effects are more than sufficient to pay their creditors. And if any suspicious or malevolent creditor will take the advantage of such acts, and sue out a commission, the bankrupt has no remedy, but must quietly submit to the effects of his own imprudence: except that, upon satisfaction made to all the creditors, the commission may be superseded. This case may also happen when a knave is desirous of defrauding his creditors, and is compelled, by a commission, to do them that justice which otherwise he wanted to evade. And therefore, though the usual rule is, that all interest on debts carrying interest shall cease from the time of issuing the commission, yet in case of a surplus left after payment of every debt, such interest shall again revive, and be chargeable on the bankrupt or his representatives.

Commission of LUNACY, issues out of the court of chancery, whether a person represented to be a lunatic, be so or not. See LUNACY.

Commission of Teinds, a court at Edinburgh, which came in place of a committee of the Scottish parliament, for erecting new parishes, and valuing teinds for the support of the clergy. It is vested in the lords of session. See LAW INDEX.

Commission-officers. See OFFICERS.

COMMISSION, in *Commerce*. See FACTORAGE.

COMMISSIONER, a person authorized by commission, letters patent, or other lawful warrant, to examine any matters, or execute any lawful commission.

COMMISSIONER in the General Assembly of the church of Scotland. See ASSEMBLY (*General*).

COMMISSIONERS of the Customs. See CUSTOMS.

COMMISSIONERS of Excise. See EXCISE.

COMMISSIONERS of the Navy. See NAVY.

Lords COMMISSIONERS of the Treasury. See TREASURY and EXCHEQUER.

COMMISSURE, a term used by some authors for the small metaphes or interfices of bodies; or the little clefts between the particles: especially when those particles are broadish and flat, and lie contiguous to one another, like thin plates and lamellæ. The word literally signifies a *joining* or connecting of one thing to another.

COMMISSURE, in *Architecture*, &c. denotes the joint of two stones, or the application of the surface of the one to that of the other. See MASONRY.

Among anatomists, commissure is sometimes also used for a future of the cranium or skull. See SUTURE.

COMMITMENT, in criminal law, is the sending to prison a person who hath been guilty of any crime. This takes place where the offence is not bailable, or the party cannot find BAIL; must be by proper warrant, containing the cause of the commitment; and continues till put an end to by the course of law (see TRIAL); imprisonment being intended only for safe custody, and not for punishment (See ARRESTMENT and BAIL). In this dubious interval between the commitment and trial, a prisoner ought to be used with the utmost humanity; and neither be loaded with needless fetters, nor subjected to other hardships than such as are absolutely requisite for the purpose of confinement only: though what are so requisite must too often be left to the discretion of the gaolers; who are frequently a merciless race of men, and, by being conversant in scenes of misery, steeled against any tender sensation.

COMMITTEE, one or more persons to whom the consideration or ordering of a matter is referred, either by some court, or by the consent of parties to whom it belongs.

COMMITTEE of Parliament, a certain number of members appointed by the house for the examination of a bill, making a report of an inquiry, process of the house, &c. See PARLIAMENT.

Sometimes the whole house is resolved into a committee; on which occasion each person has a right to speak and reply as much and as often as he pleases: an expedient they usually have recourse to in extraordinary cases, and where any thing is to be thoroughly canvassed. When the house is not in a committee, each gives his opinion regularly, and is only allowed to speak once, unless to explain himself.

The standing committees, appointed by every new parliament, are those of privileges and elections, of religion, of grievances, of courts of justice, and of trade; though only the former act.

COMMIXTION, in Scots law, is a method of acquiring property, by mixing or blending together different substances belonging to different proprietors. See LAW INDEX.

Commis-
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Commis-
sion.

COMMODATE,

Commo-
date
||
Common.

COMMODATE, COMMODATUM, in the civil jurisprudence, the loan or free concession of any thing moveable or immoveable, for a certain time, on condition of restoring again the same individual after a certain term. The commodate is a kind of loan; there is this difference, however, between a loan and a commodate, that the latter is gratis, and does not transfer the property: the thing must be returned in essence, and without impairment; so that things which consume by use or time cannot be objects of a commodate, but of a loan; in regard they may be returned in kind, though not in identity. See *Law Index*.

COMMODIANUS, GAZEBUS, a Christian author in the 4th century, who wrote a work in Latin verse, entitled *Instructions*; the moral of which is excellent, but the verse extremely heavy. M. Davies published a fine edition of it in 1711, at the end of *Minucius Felix*.

COMMODITY, in a general sense, denotes all sorts of wares and merchandises whatsoever that a person deals or trades in.

Staple Commodities, such wares and merchandises as are commonly and readily sold in a market, or exported abroad; being for the most part the proper produce or manufacture of the country.

COMMODORE, a general officer in the British marine, invested with the command of a detachment of ships of war destined on any particular enterprise, during which time he bears the rank of brigadier-general in the army, and is distinguished from the inferior ships of his squadron by a broad red pendant tapering towards the outer end, and sometimes forked. The word is corrupted from the Spanish, *comendador*.

COMMODORE is also a name give to some select ship in a fleet of merchantmen, who leads the van in time of war, and carries a light in his top to conduct the rest, and keep them together. He is always the oldest captain in the fleet he commands.

COMMODUS, L. AURELIUS ANTONINUS, son of M. Antoninus, succeeded his father in the Roman empire. He was naturally cruel and fond of indulging his licentious propensities. He wished to be called Hercules; and like that hero, he adorned his shoulders with a lion's skin, and armed his hand with a knotted club. He publicly fought with the gladiators, and boasted of his dexterity in killing the wild beasts in the amphitheatre. He required divine honours from the senate, and they were granted. He was wont to put such an immense quantity of gold dust in his hair, that when he appeared bare-headed in the sunshine, his head glittered as if surrounded with sun-beams. Martia, one of his concubines, whose death he had prepared, poisoned him; but as the poison did not quickly operate, he was strangled by a wrestler. He died in the 31st year of his age, and the 13th of his reign. It has been observed, that he never trusted himself to a barber; but always burnt his beard, in imitation of the tyrant Dionysius. A. D. 192.

COMMON, COMMUNIS, something that belongs to

all alike; is owned or allowed by all; and not confined to this more than that. In this sense, *common* stands opposed to *proper*, *peculiar*, &c. Thus, the earth is said to be our *common* mother; in the first or golden age all things were in *common*, as well as the sun and elements: the name animal is *common* to man and beast; that of substance to body and spirit.

COMMON, *Communia*, (i. e. *quod ad omnes pertinet*), in law, signifies that soil, the use whereof is common to a particular town or lordship; or it is a profit that a man hath in the land of another person, usually in common with others; or a right which a person hath to put his cattle to pasture into ground that is not his own. And there is not only common of pasture, but also common of piscary, common of estovers, common of turbary, &c. And in all cases of common, the law much respects the custom of the place; for there the rule is, *consuetudo loci est observanda*. See *COMMONTY*.

Common Council. See *COUNCIL*.

Common Law, that body of law received as rules in parliament to alter the same. See *LAW*, Part II. N^o 36.

Common-Place Book, is a register of what things occur, worthy to be noted, in the course of a man's thinking or study, so disposed as that among a number of subjects any one may be easily found. The advantages of making a common-place book are many: it not only makes a man read with accuracy and attention, but induces him insensibly to think for himself, provided he considers it not so much as a register of sentiments that strike him in the course of reading, but as a register of his own thoughts upon various subjects. Many valuable thoughts occur even to men of no extraordinary genius. These, without the assistance of a common-place book, are generally lost both to himself and others. There are various methods of arranging common-place books; that of Mr Locke is as good as any that have hitherto been contrived.

The first page of the book you intend to take down their common-place in, is to serve as a kind of index to the whole, and to contain references to every place or matter therein: in the commodious contrivance of which index, so as it may admit of a sufficient copia or variety of materials, without any confusion, all the secret of the method consists.

In order to this, the first page, as already mentioned, or, for more room, the two first pages that front each other, are to be divided by parallel lines into 25 equal parts; whereof every fifth line is to be distinguished by its colour or other circumstance. These lines are to be cut perpendicularly by others, drawn from top to bottom: and in the several spaces thereof, the several letters of the alphabet, both capital and minuscule, are to be duly written.

The form of the lines and divisions, both horizontal and perpendicular, with the manner of writing the letters therein, will be conceived from the following specimen; wherein, what is to be done in the book for all the letters of the alphabet, is here shown in the first four, *A*, *B*, *C*, and *D*.

a	a
e	e
A i	C i
o	o
u	u
a	a
e 2, 3.	e
B i	D i
o	o
u	u

The index to the common-place book thus formed, matters are ready for the taking down any thing therein.

In order to this, consider to what head the thing you would enter is most naturally referred; and under which one would be led to look for such a thing; in this head, or word, regard is had to the initial letter, and the first vowel that follows it; which are the characteristic letters whereon all the use of the index depends.

Suppose (*e. gr.*) I would enter down a passage that refers to the head *beauty*. *B*, I consider, is the initial letter, and *e* the first vowel: then, looking upon the index for the partition *B*, and therein the line *e* (which is the place for all words whose first letter is *b*, and first vowel *e*; as *beauty*, *benevolence*, *bread*, *breeding*, *blemishes*), and finding no numbers already down to direct me to any page of the book where words of this characteristic have been entered, I turn forward to the first blank page I find (which, in a fresh book, as this is supposed to be, will be page 2d), and here write what I have occasion for on the head *beauty*; beginning the head in the margin, and indenting all the other subservient lines, that the head may stand out and show itself; this done, I enter the page where it is written, viz. 2, in the index in the space *Be*; from which time the class *be* becomes wholly in possession of the 2d and 3d pages, which are consigned to letters of this characteristic.

Had I found any page or number already entered in the space *Be*, I must have turned to the page, and have written my matter in what room was left therein: so, if after entering the passage on *beauty*, I should have occasion for *benevolence*, or the like, finding the number 2 already possessed of the space of this characteristic, I begin the passage on *benevolence* in the remainder of the page; which not containing the whole, I carry it on to page 3d, which is also for *be*; and add the number 3 in the index.

COMMON Pleas is one of the king's courts now held constantly in Westminster-hall, but in former times was moveable.

All civil causes, as well real as personal, are, or were formerly, tried in this court, according to the strict law of the land. In personal and mixed actions it has a concurrent jurisdiction with the king's bench, but has no cognizance of pleas of the crown. The actions belonging to the court of common-pleas come thither by original, as arrests and outlawries; or by privilege, or attachment for or against privileged persons; or out of inferior courts, not of record, by *pone*,

recordari, *accedas ad curiam*, writ of false judgment, &c. The chief judge of this court is called *lord chief justice of the common pleas*, who is assisted by three other judges. The other officers of the court are the *custos brevium*, who is the chief clerk; three prothonotaries, and their secondaries; the clerk of the warrants, clerk of the essoins, 14 filazers, 4 exigentors, a clerk of the juries, the chirographer, the clerk of the king's silver, clerk of the treasury, clerk of the seal, clerk of the outlawries, clerk of the inrolment of fines and recoveries, and clerk of the errors.

COMMON-Prayer is the liturgy in the church of England: (See *LITURGY*.) Clergymen are to use the public form of prayers prescribed by the Book of Common Prayer: and refusing to do so, or using any other public prayers, are punishable by stat. 1. Eliz. c. ii.

COMMON, in *Grammar*, denotes the gender of nouns which are equally applicable to both sexes; thus, *parents* "a parent," is of the common gender.

COMMON, in *Geometry*, is applied to an angle, line, or the like, which belongs equally to two figures.

COMMON Divisor, a quantity or number which exactly divides two or more other quantities or numbers, without leaving any remainder.

COMMONALTY, the lower of the two divisions of the civil state. See *CIVIL State*.

The commonalty, like the nobility, are divided into several degrees: and as the lords, though different in rank, yet all of them are peers in respect of their nobility; so the commoners, though some are greatly superior to others, yet all are in law commonalty, in respect of their want of nobility.

1. The first name of dignity next beneath a peer was anciently that of *vidames*, *vice-domini*, or *valvassors*: who are mentioned by our ancient lawyers as *viri magnæ dignitatis*; and Sir Edward Coke speaks highly of them. Yet they are now quite out of use; and our legal antiquarians are not agreed upon even their original or ancient office.

2. Now, therefore, the first personal dignity after the nobility is a knight of the order of St George, or of the garter, first instituted by Edw. III. A. D. 1344.

3. Next (but not till after certain official dignities, as privy-counsellors, the chancellors of the exchequer and duchy of Lancaster, the chief justice of the king's bench, the master of the rolls, and the other English judges), follows a *knight banneret*; who indeed, by statutes 5 Richard II. stat. 2. c. 4. and 14 Richard II. c. 11. is ranked next after barons; and his precedence before the younger sons of viscounts was confirmed to him by order of King James I. in the tenth year of his reign.

Common-
alty.

reign. But in order to entitle him to this rank, he must have been created by the king in person, in the field, under the royal banners, in time of open war; else he ranks after

4. *Baronets*; who are the next in order: which title is a dignity of inheritance, created by letters patent, and usually descendible to the issue-male. See *BARONETS*.

5. Next follow *knights of the Bath*. See *BATH*.

6. The last of these inferior nobility are *knights bachelors*; the most ancient, though the lowest, order of knighthood amongst us. See *BACHELOR*.

7. The above, with those enumerated under the article *NOBILITY*, Sir Edward Coke says, are all the names of *dignity* in this kingdom; *esquires* and *gentlemen* being only names of *worship*. But before these last the heralds rank all colonels, serjeants at law, and doctors in the three learned professions.

8. *Esquires* and *gentlemen* are confounded together by Sir Edward Coke; who observes, that every esquire is a gentleman, and a gentleman is defined to be one *qui arma gerit*, "who bears coat-armour;" the grant of which adds gentility to a man's family: in like manner as civil nobility among the Romans was founded in the *jus imaginum*, or having the image of one ancestor at least who had borne some curule office. It is indeed a matter somewhat unsettled what constitutes the distinction, or who is a real esquire; for it is not an estate, however large, that confers this rank upon its owner. Camden, who was himself a herald, distinguishes them the most accurately; and he reckons up four sorts of them: 1st, The eldest sons of knights, and their eldest sons, in perpetual succession. 2dly, The eldest sons of younger sons of peers, and their eldest sons, in like perpetual succession: both which species of esquires Sir Henry Spelman entitles *armigeri nataliui*. 3dly, Esquires created by the king's letters patent, or other investiture; and their eldest sons. 4thly, Esquires by virtue of their office: as justices of the peace and others who bear any office of trust under the crown. To these may be added the esquires of the knights of the bath, each of whom constitutes three at his installation; and all foreign, nay, Irish peers; for not only these, but the eldest sons of peers of Great Britain, though frequently titular lords, are only esquires in the law, and must be so named in all legal proceedings.

9. As for *gentlemen*, says Sir Thomas Smith, they be made good cheap in this kingdom: for whosoever studieth the laws of the realm, who studieth in the universities, who professeth liberal sciences, and (to be short) who can live idly and without manual labour, and will bear the part, charge, and countenance of a gentleman, he shall be called master, and shall be taken for a gentleman.

10. A *yeoman* is he that hath free land of 40s. by the year; who is thereby qualified to serve on juries, vote for knights of the shire, and do any other act where the law requires one that is *probus et legalis homo*.

11. The rest of the commonalty are *tradesmen*, *artificers*, and *labourers*; who (as well as all others) must, in pursuance of the statute 1 Henry V. c. 5. be styled by the name and addition of their estate,

degree, or mystery, in all actions and other legal proceedings.

COMMONER, or *GENTLEMAN-COMMONER*, in the universities, a student entered in a certain rank.

COMMONS, or *HOUSE OF COMMONS*, a denomination given to the lower house of parliament. See *PARLIAMENT*.

The commons consist of all such men of any property in the kingdom as have not seats in the house of lords, every one of whom has a voice in parliament, either personally or by his representatives. In a free state, every man, who is supposed a free agent, ought to be in some measure his own governor; and therefore a branch at least of the legislative power should reside in the whole body of the people. And this power, when the territories of the state are small and its citizens easily known, should be exercised by the people in their aggregate or collective capacity, as was wisely ordained in the petty republics of Greece, and the first rudiments of the Roman state. But this will be highly inconvenient when the public territory is extended to any considerable degree, and the number of citizens is increased. Thus when, after the Social war, all the burghers of Italy were admitted free citizens of Rome, and each had a vote in the public assemblies, it became impossible to distinguish the spurious from the real voter, and from that time all elections and popular deliberations grew tumultuous and disorderly; which paved the way for Marius and Sylla, Pompey and Cæsar, to trample on the liberties of their country, and at last to dissolve the commonwealth. In so large a state as ours, therefore, it is very wisely contrived, that the people should do that by their representatives which it is impracticable to perform in person: representatives chosen by a number of minute and separate districts, where in all the voters are or may be easily distinguished. The counties are therefore represented by knights, elected by the proprietors of lands; the cities and boroughs are represented by citizens and burgesses, chosen by the mercantile or supposed trading interest of the nation; much in the same manner as the burghers in the diet of Sweden are chosen by the corporate towns, Stockholm sending four, as London does with us, other cities two, and some only one. The number of English representatives is 513, of Scots 45; in all 558; and every member, though chosen by one particular district, when elected and returned, serves for the whole realm; for the end of his coming thither is not particular, but general; not barely to advantage his constituents, but the commonwealth; to advise his majesty, as appears from the writ of summons, "de communi consilio super negotiis quibusdam arduis et urgentibus, regem, statum, et defensionem regni Angliæ et ecclesiæ Anglicanæ concernentibus." And therefore he is not bound, like a deputy in the United Provinces, to consult with, or take the advice of, his constituents upon any particular point, unless he himself thinks it proper or prudent so to do.

The peculiar laws and customs of the house of commons relate principally to the raising of taxes, and the elections of members to serve in parliament. See *TAXES* and *ELECTIONS*.

Doctors

Commoner,
Commons.

Commonty
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Communi-
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Communi-
on.

Doctors Commons. See COLLEGE of *Civilians.*

Proctor of the Commons. See PROCTOR.

COMMONTY, in *Scots Law*, sometimes signifies lands belonging to two or more common proprietors; sometimes a heath or muir, though it should belong in property to one, if there has been a promiscuous possession upon it by pasturage; and the act 1695 mentions commonities belonging in property to the king and to royal boroughs. See *LAW Index.*

COMMONWEALTH. See REPUBLIC.

COMMOTE, an ancient term in Wales, denoting half a cantred, or hundred; containing 50 villages. See HUNDRED. Wales was anciently divided into three provinces; each of these subdivided into cantreds, and every cantred into two commotes or hundreds. Silvester Girald, however, tells us in his itinerary, that a commote is but a quarter of a hundred.

COMMUNIS, in *Botany*, the name of a class in Linnæus's *Methodus Calycina*, consisting of two plants which, like teazel and dandelion, have a calyx or flower-cup common to many flowers or florets. These are the aggregate or compound flowers of other systems.

COMMUNIBUS LOCIS, a Latin term, in frequent use among philosophical, &c. writers; implying some medium, or mean relation, between several places. Dr Keil supposes the ocean to be one quarter of a mile deep, *communibus locis*, q. d. at a medium, or taking one place with another.

COMMUNIBUS Annis, has the same import with regard to years that *communibus locis* has with regard to places. Mr Derham observes that the depth of rain, *communibus annis*, or one year with another, were it to stagnate on the earth, would amount in Townley in Lancashire, to $42\frac{1}{2}$ inches; at Upminster in Essex, to $19\frac{1}{4}$; at Zurich, $32\frac{1}{4}$; at Pisa, $43\frac{1}{4}$; and at Paris to 19 inches.

COMMUNICATING, in *Theology*, the act of receiving the sacrament of the eucharist. Those of the reformed, and of the Greek church, communicate under both kinds; those of the Romish, under only one. The oriental communicants receive the species of wine by a spoon, and anciently they sucked it through a pipe, as has been observed by Beat. Rheanus on Tertullian.

COMMUNICATION, in a general sense, the act of imparting something to another.

COMMUNICATION, is also used for the connection of one thing with another, or the passage from one place to another; thus a gallery is a communication between two apartments.

COMMUNICATION of motion, the act whereby a body at rest is put into motion by a moving body; or, it is the acceleration of motion in a body already moving.

Lines of COMMUNICATION, in military matters, trenches made to continue and preserve a safe correspondence between two forts or posts; or at a siege, between two approaches, that they may relieve one another.

Canal of COMMUNICATION. See CANAL.

COMMUNION, in matters of religion, the being united in doctrine and discipline; in which sense of the word, different churches are said to hold communion with each other.

In the primitive Christian church, every bishop was obliged, after his ordination, to send circular letters to foreign churches, to signify that he was in communion with them. The three grand communions into which the Christian church is at present divided, is that of the church of Rome, the Greek church, and the Protestant church: but originally all Christians were in communion with each other, having one common faith and discipline.

COMMUNION is also used for the act of communicating the sacrament of the eucharist, or the Lord's supper.

The fourth council of Lateran decrees, that every believer shall receive the communion, at least, at Easter; which seems to import a tacit desire, that they should do it oftener; as, in effect, they did it much oftener in the primitive days. Gratian, and the master of the sentences, prescribe it as a rule for the laity, to communicate three times a-year, at Easter, Whitsuntide, and Christmas. But in the 13th century, the practice was adopted, never to approach the eucharist, except at Easter; and the council thought fit to enjoin it then by a law, lest their coldness and remissness should go farther still. And the council of Trent renewed the same injunction, and recommended frequent communion without enforcing it by an express decree.

In the ninth century, the communion was still received by the laity in both kinds; or, rather, the species of bread was dipped in the wine, as is owned by the Romanists themselves. (*Acta SS. Benedict. sæc. III.*) M. de Marca observes, that they received it at first in their hands, Hist. de Bearn, and believes the communion under one kind alone to have had its rise in the West under Pope Urban II. in 1096, at the time of the conquest of the Holy Land. And it was more solemnly enjoined by the council of Constance in 1414. The twenty-eighth canon of the council of Clermont enjoins the communion to be received under both kinds, distinctly; adding, however, two exceptions; the one of necessity, the other of caution, *nisi per necessitatem et cautelam*; the first in favour of the sick, the second of the abstemious, or those who had an aversion for wine.

It was formerly a kind of canonical punishment, for clerks guilty of any crime, to be reduced to *lay communion*, i. e. only to receive it as the laity did, viz. under one kind.

They had another punishment of the same nature, though under a different name, called *foreign communion*; to which the canons frequently condemned their bishops and other clerks. This punishment was not any excommunication, or deposition; but a kind of suspension from the function of the order, and a degradation from the rank they held in the church. It had its name because the communion was only granted to the criminal on the foot of a foreign clerk, i. e. being reduced to the lowest of his order, he took place after all those of his rank, as all clerks, &c. did in the churches to which they did not belong. The second council of Agda orders every clerk that absents himself from the church to be reduced to foreign communion.

COMMUNION Service, in the liturgy of the church of England, the office for the administration of the holy

Community sacrament, extracted from several ancient liturgies, as those of St Basil, St Ambrose, &c.

Compact. By the last rubric, part of this service is appointed to be read every Sunday and holyday, after the morning prayer, even though there be no communicants.

COMMUNITY, denotes a society of men living in the same place, under the same laws, the same regulations, and the same customs.

COMMUTATION, in *Law*, the change of a penalty or punishment from a greater to a less; as when death is commuted for banishment, &c.

COMNENA, ANN, daughter of Alexius Comnenus emperor of the East; memorable for her great learning and virtue, and for her history of the life and actions of her father, which is highly esteemed. She flourished about the year 1117. The history, which is in 15 books, was first published very imperfectly by Heschelius in 1610; and afterwards printed in the collection of the Byzantine historians, with a diffuse and incorrect Latin version by the Jesuit Possimus, but with excellent notes by the learned Du Fresne.

COMO, a strong and populous town of Italy, in the duchy of Milan, and in the Comasco, with a bishop's see. It was taken by the Imperialists in 1706, and is seated on a lake of the same name, in E. Long. 8. 57. N. Lat. 45. 45.

COMO, the lake so called, is the largest in Italy. It is situated in the duchy of Milan in the Comasco, on the confines of Switzerland and the Grisons. It is 88 miles in circumference, yet is not above 6 miles over in any part.

COMORA islands, lie between the north end of the island of Madagascar and the coast of Zanguebar, from 10 to 15 degrees south latitude. Authors differ greatly with regard to their number, some speaking of three, others of five, and some of eight of these islands. They all abound in horned cattle, sheep, hogs, and a variety of fruits common in warm countries. They are said also to produce a kind of rice which turns of a violet colour when boiled. The most remarkable of them, and which the Europeans are best acquainted with, is the island of Johanna. See that article.

COMORIN, or **CAPE COMORIN**, the most southerly promontory of the Hither India, lying north-west of the island of Ceylon.

COMORRA, a handsome and large town of Lower Hungary, and capital of a territory of the same name. It is so well fortified, that the Turks could never take it. The greatest part of the inhabitants are Hungarians or Russians, who are very rich, and are of the Greek religion. It is seated on the river Danube, in the island of Silbut. E. Long. 18. 5. N. Lat. 47. 46.

COMOSÆ, in *Botany*, from *Coma*; an order of plants in the former edition of Linnæus's Fragments of a Natural Method, consisting of the spiked willow or spiræa frutex, dropwort, and greater meadow-sweet. These, though formerly distinct genera, are by Linnæus collected into one, under the name of *spiræa*. The flowers growing in a head, resemble a bush, or tuft of hair, which probably gave rise to the epithet *Comosæ*.

COMPACT, in *Philosophy*, is said of bodies which

are of a close, dense, and heavy texture, with few pores, and those very small.

COMPACT, in a legal sense, signifies an agreement or contract stipulated between several parties.

COMPANION, one with whom a man frequently converses.

As the human mind cannot always be on the stretch, nor the hands always employed in labour, recreation becomes both agreeable and necessary. Of all recreations, that of the company of a few chosen companions must be allowed to be the most manly and most improving: but as in those hours of recreation we are most in danger of being misled, being generally at such seasons more off our guard than usual, the greatest care should be taken in making choice of whom to associate with; for according to our choice of them, both our character and disposition will receive a tincture, as waters passing through minerals partake of their taste and efficacy. This is a truth so universally received, that it is become a proverb both in the natural and moral world, 'That a man is known by his company.' As by chemistry we learn, that discordant mixtures produce nothing but broil and fermentation till one of them gets the ascendancy of the rest; so from Scripture we learn, that two cannot walk together except they be agreed. From which we may see, how impossible it is for any one to be thought a person of real goodness and integrity, whilst he chooses for his companions the abandoned and licentious.

By associating with such, he will not only lose his character, but his virtue; for whatever fallacious distinction he may be pleased to make between the men and their vices, in the end the first generally qualifies the last; and by ceasing to hate them he will soon learn both to love and practise them. In short, the society of sensual men is peculiarly ensnaring. The malignity of their contagion doth not appear all at once. Their frolics first appear harmless; then, when partaken of, they leave a longing relish behind them; and one appointment makes way for another, one expense leads on to a second; and so time and fortune are wasted away to very bad purpose. Then one appetite craves, and another must be gratified, till all become too importunate to be denied; which verifies what the wisest of men long since said, "That the beginning of sin is like the breaking forth of waters, which when it once makes an entrance, carrieth all before it with rushing impetuosity." Some pangs of remorse may be felt by the infatuated creature on his first degeneracy, and some faint resolutions against being seduced any more; which will no sooner be discovered by those leaders to destruction, than all arts will be used to allure him back to bear them company in the broad beaten path to ruin. Of all which methods, none is more to be dreaded than raillery; for this is generally exercised with all its force, and too often proves fatal. Another method used to mislead the young novice not yet hackneyed in vice, and no less dangerous than the other, is to call evil good, and good evil. Lust and sensuality must pass for love and gallantry; revenge and malice, for heroism. But steadiness should be shown, by holding such pests of society in derision, and looking on them with contempt; by appearing unmoved

Compact,
Companion.

Company. ved by their ill-founded banter, and unftung by their impious jefts.

Upon the whole, in order to efcape the danger which attends the keeping of evil company, let thofe you afciate with be perfons as carefully educated and as honeftly difpofed as yourfelf; of a good moral character, not given to any known vice; whofe lives are temperate, and whofe expences are moderate: with fuch company as thefe, you will neither get difcredit, nor degenerate into excefs. You will be a mutual check to each other; and your reputation will be fo eftablifhed, that it will be the ambition of others to be admitted members of your fociety. Select thofe for your companions who are men of good fenfe and underftanding; and, if poffible, who excel in fome art, fciences, or accomplifhment; that fo, in the courfe of your acquaintance, your very hours of amufement may contribute to your improvement; and for the moft part fuch are open and communicative, and take as much pleafure in being heard as you to be informed. By purfuing fuch a conduct, you will be an ornament and ufeful member of fociety.

COMPANY, a collective term, underftood of feveral perfons afsembled together in the fame place, or with the fame defign. The word is formed of the French *compagnie*, and that of *compagnio*, or *companies*, which Chifflet obferves, are found in the Salic law, tit. 66. and are proper military words, underftood of foldiers, who, according to the modern phrafe, are comrades or mefs-mates, i. e. lodge together, eat together, &c. of the Latin *cum*, "with," and *panis*, "bread." It may be added, that in fome Greek authors under the weftern empire, the word *κωμωσται* occurs in the fenfe of fociety.

COMPANY, in a familiar or fashionable fenfe, is ufed for an afsemblage of perfons met for the purpofe of converfation, paftime, or feftivity.

The love of company and of focial pleafures is natural, and attended with fome of the sweeteft fatisfactions of human life; but, like every other love, when it proceeds beyond the limits of moderation, it ceafes to produce its natural effect, and terminates in difguftful fatiety. The foundation-ftone and the pillar on which we build the fabric of our felicity, muft be laid in our own hearts. Amufement, mirth, agreeable variety, and even improvement, may be fometimes fought in the gaiety of mixed company, and in the ufual diverfions of the world; but if we found our general happinefs on thefe, we fhall do little more than raife caftles in the air, or build houfes on the fand.

To derive the proper pleafure and improvement from company, it ought to be felect, and to confift of perfons of character, refpectable both for their morals and their underftandings. Mixed and undiftinguifhed fociety tends only to diffipate our ideas, and induce a laxity of principles and practice. The pleafure it affords is of a coarfe, mixed, noify, and rude kind. Indeed, it commonly ends in wearinefs and difguft, as even they are ready to confefs who yet constantly purfue it, as if their chief good confifted in living in a crowd.

Among thofe, indeed, who are exempted by their circumftances from professional and official employments, and who profefedly devote themfelves to a life of pleafure, little elfe feems to conftitute the idea of it,

but an unceafing fucceffion of company, public or private. The drefs, and other circumftances preparatory to the enjoyment of this pleafure, fcarcely leave a moment for reflection. Day after day is fpent in the fame toifome round, till a habit is formed, which renders difipation neceffary to exiftence. One week without it would probably induce a lownefs of fpirits, which might terminate in defpair and fuicide. When the mind has no anchor, it will fuffer a kind of fhipwreck; it will fink in whirlpools, and be dafhed on rocks. What, indeed, is life or its enjoyments without fettled principles, laudable purpofes, mental exertions, and internal comfort? It is merely a vapour, or, to drop the language of figure on fo ferious a fubject, it is a ftate worfe than non-entity, fince it poffeffes a reftlefs power of action, productive of nothing but mifery.

It is recommended, therefore, to all who wifh to enjoy their exiftence (and who entertains not that wifh?) that they fhould acquire a power not only of bearing, but of taking a pleafure in, temporary folitude. Every one muft, indeed, fometimes be alone. Let him not repine when he is alone, but learn to fet a value on the golden moments. It is then that he is enabled to ftudy himfelf and the world around him. It is then that he has an opportunity of feeing things as they are, and of removing the deceitful veil, which almoft every thing affumes in the bufy fcene of worldly employments. The foul is enabled to retire into herfelf, and to exert thofe energies which are always attended with fublime pleafure. She is enabled to fee the dependent, frail, and wretched ftate of man as the child of nature; and incited by her difcovery, to implore grace and protection from the Lord of the univerfe. They, indeed, who fly from folitude, can feldom be religious; for religion requires meditation. They may be faid to "live without God in the world; not, it is true, from atheiftical principles, but from a careleffnefs of difpofition; a truly deplorable ftate, the confcioufnefs of which could not fail to cloud the gaiety of thofe halcyon beings who fport in the funfhine of unremitted pleafure.

There is no doubt that man is made for action, and that his duties and pleafures are often moft numerous and moft important amidft the bufy hum of men. Many vices, and many corrupt difpofitions, have been foftered in a folitary life. Monkery is not favourable to human nature or human happinefs; but neither is unlimited difipation.

In fhort, let there be a fweet interchange of retirement and afociation, of repofe and activity. A few hours fpent every day by the votaries of pleafure in ferious meditation, would render their pleafure pure, and more unmixed with mifery. It would give them knowledge, fo that they would fee how far they might advance in their purfuit without danger; and refolution; fo that they might retreat when danger approached. It would teach them how to live, a knowledge which indeed they think they poffefs already; and it would alfo teach them, what they are often too little follicitous to learn, how to die.

COMPANY, in a commercial fenfe, is a fociety of merchants, mechanics, or other traders, joined together in one common intereft.

When there are only two or three joined in this manner, it is called a partnership; the term *company* being

Company.

Company. being restrained to societies consisting of a considerable number of members, associated together by a charter obtained from the prince.

The mechanics of all corporations, or towns incorporated, are thus erected into companies, which have charters of privileges and large immunities.

COMPANY seems more particularly appropriated to those grand associations set on foot for the commerce of the remote parts of the world, and vested by charter with peculiar privileges.

When companies do not trade upon a joint stock, but are obliged to admit any person, properly qualified, upon paying a certain fine and agreeing to submit to the regulations of the company, each member trading upon his own stock and at his own risk, they are called *Regulated Companies*. When they trade upon a joint stock, each member sharing in the common profit or loss in proportion to his share in this stock, they are called *Joint-stock Companies*. Such companies, whether regulated or joint-stock, sometimes have, and sometimes have not, exclusive privileges.

However injurious companies with joint-stock, and incorporated with exclusive privileges, may at this time be reckoned to the nation in general, it is yet certain that they were the general parent of all our foreign commerce; private traders being discouraged from hazarding their fortunes in foreign countries, until the method of traffick had been first settled by joint-stock companies. But since the trade of this kingdom and the number of traders have increased, and the methods of assurance of shipping and merchandize, and the navigation to all parts of the known world have become familiar to us, these companies, in the opinion of most men, have been looked upon in the light of monopolies; their privileges have therefore been lessened from time to time, in order to favour a free and general trade; and experience has shown, that the trade of the nation has advanced in proportion as monopolies have been discouraged. In short, as all restrictions of trade are found to be hurtful, nothing can be more evident, than that no company whatsoever, whether they trade in a joint stock or only under regulation, can be for the public good, except it may be easy for all or any of his majesty's subjects to be admitted into all or any of the said companies, at any time, and for a very inconsiderable fine.

I. REGULATED Companies resemble, in every respect, the corporations of trades, so common in the cities and towns of all the different countries of Europe; and are a sort of enlarged monopolies of the same kind. As no inhabitant of a town can exercise an incorporated trade, without first obtaining his freedom in the corporation; so in most cases no subject of the state can lawfully carry on any branch of foreign trade, for which a regulated company is established, without first becoming a member of that company. The monopoly is more or less strict according as the terms of admission are more or less difficult; and according as the directors of the company have more or less authority, or have it more or less in their power to manage in such a manner as to confine the greater part of the trade to themselves and their particular friends. In the most ancient regulated companies the privileges of apprenticeship were the same as in other corporations; and entitled the person who had served his time to a

member of the company, to become himself a member, either without paying any fine, or upon paying a much smaller one than what was exacted of other people. The usual corporation spirit, wherever the law does not restrain it, prevails in all regulated companies. When they have been allowed to act according to their natural genius, they have always, in order to confine the competition to as small a number of persons as possible, endeavoured to subject the trade to many burdensome regulations. When the law has restrained them from doing this, they have become altogether useless and insignificant.

The regulated companies for foreign commerce, which at present subsist in Great Britain, are, The *Hamburg Company*, the *Russia Company*, the *Eastland Company*, the *Turkey Company*, and the *African Company*.

1. *The Hamburg Company* is the oldest trading establishment in the kingdom; though not always known by that name, nor restrained to those narrow bounds under which it is now confined. It was first called the *Company of Merchants trading to Calais, Holland, Zealand, Brabant, and Flanders*: then it acquired the general title of *Merchant-adventurers of England*: as being composed of all the English merchants who traded to the Low Countries, the Baltic, and the German ocean. Lastly, it was called the *Company of Merchant-adventurers of England trading to Hamburg*.

This company was first incorporated by Edward I. in 1296; and established again, by charter, in 1406, under the reign of King Henry IV. It was afterwards confirmed, and augmented with divers privileges, by many of his successors. Before the charter of Henry IV. all the English merchants who trafficked out of the realm, were left to their own discretion, and managed their affairs with foreigners as might be most for their respective interests, without any regard to the general commerce of the nation. Henry, observing this disorder, endeavoured to remedy it, by uniting all the merchants in his dominions into one body; wherein, without losing the liberty of trading each for himself, they might be governed by a company still subsisting; and be subject to regulations, which should secure the general interest of the national commerce, without prejudice to the interest of particulars. With this view, he granted all the merchants of his states, particularly those of Calais, then in his hands, a power of associating themselves into a body politic, with directors and governors, both in England and abroad; to hold assemblies, both for the direction of business and the deciding of controversies among merchants; make laws; punish delinquents; and impose moderate duties and taxes on merchandises, and merchants, to be employed in the service of the corporation. These few articles of the charter of Henry IV. were afterwards much augmented by Henry VII. who first gave them the title of *Merchant-adventurers to Calais, Holland, &c.* gave them a power of proclaiming and continuing free fairs at Calais; and ordered, that to be reputed a member of the society, each person pay 20 marks sterling; and that the several members should attend the general meetings, or courts, appointed by the directors, whether at London, Calais, or elsewhere.

A petition being made to Queen Elizabeth, in 1564, for

Company. for an explanation of certain articles in the charter of Henry VII. and a confirmation of the rest granted by other kings; that prince, by a charter of the same year, declares that, to end all disputes, they shall be incorporated anew, under the title of the *Company of Merchant-adventurers of England*; that all who were members of the former company should, if they desired it, be admitted members of this; that they should have a common seal; that they should admit into their society what other persons, and on what terms, they pleased, and expel them again on misbehaviour; that the city of Hamburg and neighbouring cities should be reputed within their grant, together with those of the Low Countries, &c. in that of the former company; that no member should marry out of the kingdom, nor purchase lands, &c. in any city beyond sea; and that those who do, shall be, *ipso facto*, excluded for ever. Twenty-two years after this first charter, Queen Elizabeth granted them a second; confirming the former, and further granting them a privilege of exclusion; with a power of erecting in each city within their grant a standing council.

The revolutions which happened in the Low Countries towards the end of the sixteenth century, and which laid the foundation of the republic of Holland, having hindered the company from continuing their commerce with their ancient freedom; it was obliged to turn it almost wholly to the side of Hamburg, and the cities on the German ocean; from which change, some people took occasion to change its name to that of the *Hamburg Company*; though the ancient title of *Merchant-adventurers* is still retained in all their writings.

About the middle of the last century, the fine for admission was fifty, and at one time one hundred pounds, and the conduct of the company was said to be extremely oppressive. In 1643, in 1645, and in 1661, the clothiers and free traders of the west of England complained of them to parliament, as of monopolists who confined the trade and oppressed the manufactures of the country. Though those complaints produced no act of parliament, they had probably intimidated the company so far, as to oblige them to reform their conduct. The terms of admission are now said to be quite easy; and the directors either have it not in their power to subject the trade to any burdensome restraint or regulations, or at least have not of late exercised that power.

2. *The Russia Company* was first projected towards the end of the reign of King Edward VI. executed in the first and second years of Philip and Mary; but had not its perfection till its charter was confirmed by act of parliament, under Queen Elizabeth, in 1566. It had its rise from certain adventurers, who were sent in three vessels on the discovery of new countries; and to find out a north-east passage to China: these, falling into the White sea, and making up to the port of Archangel, were exceedingly well received by the Muscovites; and, at their return, solicited letters patent to secure to themselves the commerce of Russia, for which they had formed an association.

By their charter, the association was declared a body politic, under the name of the *Company of Merchant-adventurers of England, for the discovery of lands, territories, islands, &c. unknown, or unfrequented.*

Their privileges were, to have a governor, four consuls, and 24 assistants, for their commerce; for their policy, to make laws, inflict penalties, send out ships to make discoveries, take possession of them in the king's name, set up the banner royal of England, plant them; and lastly, the exclusive privilege of trading to Archangel, and other ports of Muscovy, not yet frequented by the English.

This charter not being sufficiently guarded, was confirmed by parliament in the eighth year of Queen Elizabeth; wherein it was enacted, that in regard the former name was too long, they should now be called *Company of English Merchants for discovering new trades*; under which name, they should be capable of acquiring and holding all kind of lands, manors, rents, &c. not exceeding 100 marks, per annum, and not held of her majesty; that no part of the continent, island, harbour, &c. not known or frequented before the first enterprise of the merchants of their company, situated to the north, or north-west, or north-east of London; nor any part of the continent, islands, &c. under the obedience of the emperor of Russia, or in the countries of Armenia, Media, Hyrcania, Persia, or the Caspian sea, should be visited by any subjects of England, to exercise any commerce, without the consent of the said company, on pain of confiscation. The said company shall use no ships in her new commerce but those of the nation; nor transport any cloths, ferges, or other woollen stuffs, till they have been dyed and pressed. That in case the company discontinue of itself to unload commodities in the road of the abbey of S. Nicolas, in Russia, or some other port, on the north coasts of Russia, for the space of three years, the other subjects of England shall be allowed to traffic to Narva, while the said company discontinues its commerce into Russia, only using English vessels.

This company subsisted with reputation almost a whole century, till the time of the civil wars. It is said, the czar then reigning, hearing of the murder of King Charles I. ordered all the English in his states to be expelled; which the Dutch taking the advantage of, settled in their room. After the restoration, the remains of the company re-established part of their commerce at Archangel, but never with the same success as before; the Russians being now well accustomed to the Dutch merchants and merchandise.

This company subsists still, under the direction of a governor, four consuls, and assistants. By the 10th and 11th of William III. c. 6. the fine for admission was reduced to 5l.

3. *The Eastland Company* was incorporated by Queen Elizabeth. Its charter is dated in the year 1579. By the first article the company is erected into a body politic, under the title of the *Company of Merchants of the East*; to consist of Englishmen, all real merchants who have exercised the business thereof, and trafficked through the Sound, before the year 1568, into Norway, Sweden, Poland, Livonia, Prussia, Pomerania, &c. as also Revel, Coningsberg, Dantzick, Copenhagen, &c. excepting Narva, Muscovy, and its dependencies. Most of the following articles grant them the usual prerogatives of such companies as a seal, governor, courts, laws, &c.

The privileges peculiar to this company are, that none shall be admitted a member who is already a member

Company. member of any other company; nor any retail-dealer at all. That no merchant qualified be admitted without paying six pounds thirteen shillings and sixpence. That a member of another company, desiring to renounce the privileges thereof, and to be received into that of the East shall be admitted *gratis*; provided he procures the same favour for a merchant of the East willing to fill his place. That the merchant-adventurers who never dealt in the East, in the places expressed in the charter, may be received as members of the company on paying 40 marks; that, notwithstanding this union of the Adventurers of England with the company of the East, each shall retain its rights and privileges. That they shall export no cloths but what are dyed and pressed, except a hundred pieces per annum, which are allowed them *gratis*. This charter was confirmed by Charles II. in 1629, with this addition, that no person, of what quality soever, living in London, should be admitted a member, unless he were free of the city. This company was complained of as a monopoly, and first curtailed by legal authority in 1672; and since the declaration of rights in 1689, exist only in name; but still continue to elect their annual officers, who are a governor, a deputy, and twenty-four assistants.

7. *The Turkey or Levant Company*, had its rise under Queen Elizabeth, in 1581. James I. confirmed its charter in 1605, adding new privileges. During the civil wars, there happened some innovations in the government of the company; many persons having been admitted members, not qualified by the charters of Queen Elizabeth and King James, or that did not conform to the regulations prescribed. Charles II. upon his restoration, endeavoured to set it upon its ancient basis; to which end, he gave them a charter, containing not only a confirmation of their old one, but also several new articles of reformation. By this, the company is erected into a body politic, capable of making laws, &c. under the title of the *Company of Merchants of England trading to the seas of the Levant*. The number of members is not limited, but is ordinarily about three hundred. The principal qualification required is, that the candidate be a freeman of London, and a wholesale merchant, either by family or by serving an apprenticeship of seven years. Those under 25 years of age pay 25l. sterling at their admission; those above, twice as much. This fine was reduced by act of parliament, in 1753, to 20l. and the privilege of admission extended to every British subject. Each makes oath at his entrance not to send any merchandises to the Levant but on his own account; and not to consign them to any but the company's agents or factors. This restriction is likewise enlarged by the above-mentioned statute.

The company has a court or board at London, which is composed of a governor, deputy-governor, and fifteen directors or assistants, who are all actually to live in London or the suburbs. They have also a deputy-governor in every city and port, where there are any members of the company. The assembly at London sends out the vessels, regulates the tariff for the price at which the European merchandises sent to the Levant are to be sold, and for the quality of those returned. It raises taxes on merchandises, to defray impositions, and the common expences of the compa-

ny; presents the ambassador which the king is to keep at the Porte, elects two consuls for Smyrna and Constantinople, &c. *Company.*

One of the best regulations of the company is, not to leave the consuls, or even ambassador, to fix the imposition on vessels for defraying the common expences (a thing fatal to the companies of most other nations); but to allow a pension to the ambassador and consuls, and even to the chief officers, as secretary, chaplain, interpreters, and janizaries, that there may not be any pretence for their raising any sum at all on the merchants or merchandises.

In extraordinary cases, the consuls, and even the ambassador, have recourse to two deputies of the company, residing in the Levant; or, if the affair be very important, they assemble the whole body. Here are regulated the presents to be given, the voyages to be made, and every thing to be deliberated; and on the resolutions here taken, the deputies appoint the treasurer to furnish the moneys, &c. required.

The ordinary commerce of this company employs from 20 to 25 vessels, carrying from 25 to 30 pieces of cannon. The merchandises exported thither are, cloths of all kinds and colours, pewter, lead, pepper, cochineal, and a great deal of silver, which they take up at Cadiz: the returns are in raw silk, galls, camlets, wools, cottons, Morocco leather, ashes for making glass and soap, and several gums and medicinal drugs. The commerce to Smyrna, Constantinople, and Scanderon, is not esteemed much less considerable than that of the East India Company; but is, doubtless, more advantageous to Britain; because it takes off much more of the British manufactures than the other, which is chiefly carried on in money. The places reserved for the commerce of this company are, all the states of Venice, in the gulf of Venice; the state of Ragusa; all the states of the grand seignior, and the ports of the Levant and Mediterranean; excepting Carthagena, Alicante, Barcelona, Valencia, Marseilles, Toulon, Genoa, Leghorn, Civita Vecchia, Palermo, Messina, Malta, Majorca, Minorca, and Corsica; and other places on the coasts of France, Spain, and Italy.

5. *The Company of Merchants trading to Africa*, established in 1750. Contrary to the former practice with regard to regulated companies, who were reckoned unfit for such sort of service, this company was subjected to the obligation of maintaining forts and garrisons. It was expressly charged at first with the maintenance of all the British forts and garrisons that lie between Cape Blanc and the Cape of Good Hope, and afterwards with that of those only which lie between Cape Rouge and the Cape of Good Hope. The act which establishes this company (the 23d of George II. c. 31.) seems to have had two distinct objects in view; first, to restrain effectually the oppressive and monopolizing spirit which is natural to the directors of a regulated company; and secondly, to force them as much as possible to give an attention, which is not natural to them, towards the maintenance of forts and garrisons.

For the first of these purposes, the fine for admission is limited to forty shillings. The company is prohibited from trading in their corporate capacity, or upon a joint stock; from borrowing money upon com-

Company. mon seal, or from laying any restraints upon the trade which may be carried on freely from all places, and by all persons being British subjects, and paying the fine. The government is in a committee of nine persons who meet at London, but who are chosen annually by the freemen of the company at London, Bristol, and Liverpool; three from each place. No committee-man can be continued in office for more than three years together. Any committee-man might be removed by the board of trade and plantations; now by a committee of council, after being heard in his own defence. The committee are forbid to export negroes from Africa, or to import any African goods into Great Britain. But, as they are charged with the maintenance of forts and garrisons, they may for that purpose export from Great Britain to Africa goods and stores of different kinds. Out of the money which they shall receive from the company, they are allowed a sum not exceeding eight hundred pounds, for the salaries of their clerks and agents at London, Bristol, and Liverpool; the house-rent of their office at London; and all other expences of management, commission, and agency, in England. What remains of this sum, after defraying those different expences, they may divide among themselves, as compensation for their trouble, in what manner they think proper. "By this constitution, it might have been expected (Dr Smith observes), that the spirit of monopoly would have been effectually restrained, and the first of these purposes sufficiently answered. It would seem, however, that it had not. Though by the 4th of George III. c. 20. the fort of Senegal, with all its dependencies, had been vested in the company of merchants trading to Africa, yet in the year following (by the 5th of George III. c. 44.), not only Senegal and its dependencies, but the whole coast from the port of Sallee, in South Barbary, to Cape Rouge, was exempted from the jurisdiction of that company, was vested in the crown, and the trade to it declared free to all his majesty's subjects. The company had been suspected of restraining the trade, and of establishing some sort of improper monopoly. It is not, however, very easy to conceive how, under the regulations of the 23d George II. they could do so. From the printed debates of the house of commons (not always the most authentic records of truth), it appears, however that they have been accused of this. The members of the committee of nine being all merchants, and the governors and factors, in their different forts and settlements, being all dependent upon them, it is not unlikely that the latter might have given peculiar attention to the consignments and commissions of the former, which would establish a real monopoly."

For the second purpose mentioned, the maintenance of the forts and garrisons, an annual sum has been allotted to them by parliament, generally about 13,000l. For the proper application of this sum, the committee is obliged to account annually to the curfitor baron of exchequer; which account is afterwards to be laid before parliament. "But parliament (continues our author), which gives so little attention to the application of millions, is not likely to give much to that of 13,000l. a-year; and the curfitor baron of exchequer, from his profession and education, is not likely to be profoundly skilled in the proper expence of forts and

Company. garrisons. The captains of his majesty's navy, indeed, or any other commissioned officers, appointed by the board of admiralty, may inquire into the condition of the forts and garrisons, and report their observations to that board. But that board seems to have no direct jurisdiction over the committee, nor any authority to correct those whose conduct it may thus inquire into; and the captains of his majesty's navy, besides, are not supposed to be always deeply learned in the science of fortification. Removal from an office, which can be enjoyed only for the term of three years, and of which the lawful emoluments, even during that term, are so very small, seems to be the utmost punishment to which any committee-man is liable, for any fault, except direct malversation, or embezzlement either of the public money or of that of the company; and the fear of that punishment, can never be a motive of sufficient weight to force a continual and careful attention to a business to which he has no other interest to attend. The committee are accused of having sent out bricks and stones from England for the reparation of Cape Coast Castle on the coast of Guinea, a business for which parliament had several times granted an extraordinary sum of money. These bricks and stones too, which had thus been sent upon so long a voyage, were said to have been of so bad a quality, that it was necessary to rebuild from the foundation the walls which had been repaired with them. The forts and garrisons which lie north of Cape Rouge are not only maintained at the expence of the state, but are under the immediate government of the executive power; and why those which lie south of that cape, and which too are, in part at least, maintained at the expence of the state, could be under a different government, it seems not very easy even to imagine a good reason."

The above company succeeded that called *The Royal African Company*, which traded upon a joint stock with an exclusive privilege. Though England began to trade to Africa as early as the year 1536, and several voyages were made to Guinea in 1588, and some following years, for the importation of gold and elephants teeth, nothing like a company was formed till the year 1588, when Queen Elizabeth granted a patent of exclusive privilege to certain persons for ten years. In 1618, King James I. established a company by charter, which was soon dissolved. Another company was erected by charter of Charles I. in 1631, which met with little success; but the demand for negroes in the English American plantations increasing, a third company was established by a charter granted 1662, in favour of the duke of York; securing to him the commerce of all the country, coasts, islands, &c. belonging to the crown of England, or not possessed by any other Christian prince, from Cape Blanco in 20° N. Lat. to the Cape of Good Hope, in 34° 34' S. Lat. The charter was soon after returned into the king's hands by the duke, and revoked, by consent of the parties associated with him in the enterprize; in consequence of which, the fourth and last exclusive company was established and incorporated by letters patent in 1672, under the title of the *Royal African Company*. A capital was soon raised of 111,000l. and this new company improved their trade, and increased their forts; but after the revolution in 1689, this trade was laid open. In 1698, all private traders to Africa were

Company obliged by stat. 9 and 10 Will. to pay ten *per cent.* in order to assist the company in maintaining their forts and factories. But notwithstanding this heavy tax, the company were still unable to maintain the competition; their stock and credit gradually declined. In 1712, their debts had become so great, that a particular act of parliament was thought necessary, both for their security and for that of their creditors. It was enacted, that the resolution of two thirds of these creditors in number and value should bind the rest, both with regard to the time which should be allowed to the company for the payment of their debts, and with regard to any other agreement which it might be thought proper to make with them concerning those debts. In 1730, their affairs were in so great disorder, that they were altogether incapable of maintaining their forts and garrisons; the sole purpose and pretext of their institution. From that year till their final dissolution, the parliament judged it necessary to allow the annual sum of ten thousand pounds for that purpose. In 1732, after having been for many years losers by the trade of carrying negroes to the West Indies, they at last resolved to give it up altogether; to sell to the private traders to America the negroes which they purchased upon the coast; and to employ their servants in a trade to the inland parts of Africa for gold dust, elephants teeth, dyeing drugs, &c. But their success in this more confined trade was not greater than in their former extensive one. Their affairs continued to go gradually to decline, till at last being in every respect a bankrupt company, they were dissolved by act of parliament, and their forts and garrisons vested in the present *Regulated Company of Merchants trading to Africa.*

II. *JOINT-STOCK Companies*, established either by royal charter or by act of parliament, differ in several respects, not only from regulated companies, but from private copartneries. 1. In a private copartnership, no partner, without the consent of the company, can transfer his share to another person, or introduce a new member into the company. Each member, however, may, upon proper warning, withdraw from the copartnership, and demand payment from them of his share of the common stock. In a joint-stock company, on the contrary, no member can demand payment of his share from the company; but each member can, without their consent, transfer his share to another person, and thereby introduce a new member. The value of a share in a joint-stock is always the price which it will bring in the market; and this may be either greater or less, in any proportion, than the sum which its owner stands credited for in the stock of the company. 2. In a private copartnership, each partner is bound for the debts contracted by the company to the whole extent of his fortune. In a joint-stock company, on the contrary, each partner is bound only to the extent of his share.

The trade of a joint-stock company is always managed by a court of directors. This court indeed is frequently subject, in many respects, to the controul of a general court of proprietors. But the greater part of those proprietors seldom pretend to understand any thing of the business of the company; and when the spirit of faction happens not to prevail among them, give themselves no trouble about it, but receive

contentedly such half-yearly or yearly dividend as the Company directors think proper to make to them. This total exemption from trouble and from risk, beyond a limited sum, encourages many people to become adventurers in joint-stock companies, who would upon no account hazard their fortunes in any private copartnership. Such companies, therefore, commonly draw to themselves much greater stocks than any private copartnership can boast of. The trading stock of the South Sea Company, at one time, amounted to upwards of thirty-three millions eight hundred thousand pounds. The directors of such companies, however, being the managers rather of other people's money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnership frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company. It is upon this account that joint-stock companies for foreign trade have seldom been able to maintain the competition against private adventurers. They have, accordingly, very seldom succeeded without an exclusive privilege; and frequently have not succeeded with one. Without an exclusive privilege they have commonly mismanaged the trade. With an exclusive privilege they have both mismanaged and confined it.

The principal joint-stock companies presently subsisting in Great Britain are, the *South Sea* and the *East India* companies; to which may be added, though of very inferior magnitude, the *Hudson's Bay* Company.

1. *The South-Sea Company.* During the long war with France in the reign of Queen Anne, the payment of the sailors of the royal navy being neglected, they received tickets instead of money, and were frequently obliged, by their necessities, to sell these tickets to avaricious men at a discount of 40 and sometimes 50 *per cent.* By this and other means, the debts of the nation unprovided for by parliament, and which amounted to 9,471,321*l.* fell into the hands of these usurers. On which Mr Harley, at that time chancellor of the exchequer, and afterwards earl of Oxford, proposed a scheme to allow the proprietors of these debts and deficiencies 6 *per cent. per annum*, and to incorporate them for the purpose of carrying on a trade to the South Sea; and they were accordingly incorporated under the title of "the Governor and Company of Merchants of Great Britain trading to the South Seas, and other parts of America, and for encouraging the Fishery," &c.

Though this company seemed formed for the sake of commerce, the ministry never thought seriously, during the course of the war, about making any settlement on the coast of South America, which was what flattered the expectations of the people; nor was it ever carried into execution by this company.

Some other sums were lent to the government in the reign of Queen Anne at 6 *per cent.* In the third of George I. the interest of the whole was reduced to 5 *per cent.* and the company advanced two millions more to the government at the same interest. By the statute

Company. Statute of the 6th of George I. it was declared, that they might redeem all or any of the redeemable national debts; in consideration of which, the company were empowered to augment their capital according to the sums they should discharge: and for enabling them to raise such sums for purchasing annuities, exchanging for ready money new exchequer bills, carrying on their trade, &c. they might, by such means as they should think proper, raise such sums of money as in a general court of the company should be judged necessary. The company were also empowered to raise money on the contracts, bonds, or obligations under their common seal, on the credit of their capital stock. But if the sub-governor, deputy governor, or other members of the company, should purchase lands or revenues of the crown upon account of the corporation, or lend money by loan or anticipation on any branch of the revenue, other than such part only on which a credit of loan was granted by parliament, such sub-governor, or other member of the company, should forfeit treble the value of the money so lent.

The fatal South Sea scheme, transacted in the year 1720, was executed upon the last mentioned statute. The company had at first set out with good success, and the value of their stock, for the first five years, had risen faster than that of any other company; and his majesty, after purchasing 10,000l. stock, had condescended to be their governor. Things were in this situation, when, taking advantage of the above statute, the South Sea bubble was projected. The pretence was, to raise a fund for carrying on a trade to the South Sea, and purchasing annuities, &c. paid to the other companies: and proposals were printed and distributed, showing the advantages of this design. The sum necessary for carrying it on, together with the profits that were to arise from it, were divided into a certain number of shares, or subscriptions, to be purchased by persons disposed to adventure therein. And the better to carry on the deception, the directors engaged to make very large dividends: and actually declared that every 100l. original stock would yield 50l. per annum: which occasioned so great a rise of their stock, that a share of 100l. was sold for upwards of 800l. This was in the month of July; but before the end of September it fell to 150l. by which multitudes were ruined, and such a scene of distress occasioned, as is scarcely to be conceived. But the consequences of this infamous scheme are too well known; most of the directors were severely fined, to the loss of nearly all their property; some of them had no hand in the deception, nor gained a farthing by it; but it was agreed, they ought to have opposed and prevented it.

The South Sea company never had any forts or garrisons to maintain, and therefore were entirely exempted from one great expence, to which other joint-stock companies for foreign trade are subject. But they had an immense capital divided among an immense number of proprietors. It was naturally to be expected, therefore, that folly, negligence, and profusion, should prevail in the whole management of their affairs.

Their stock-jobbing speculations were succeeded by mercantile projects, which, Dr Smith observes, were not much better conducted. The first trade which

they engaged in, was that of supplying the Spanish Company. West Indies with negroes, of which (in consequence of what was called the Asiento contract granted them by the treaty of Utrecht) they had the exclusive privilege. But as it was not expected that much profit could be made by this trade, both the Portuguese and French companies, who had enjoyed it upon the same terms before them, having been ruined by it, they were allowed, as compensation, to send annually a ship of a certain burden to trade directly to the Spanish West Indies. Of the ten voyages which this annual ship was allowed to make, they are said to have gained considerably by one, that of the Royal Caroline in 1731, and to have been losers, more or less, by almost all the rest. Their ill success was imputed, by their factors and agents, to the extortion and oppression of the Spanish government; but was, perhaps, principally owing to the profusion and depredations of those very factors and agents; some of whom are said to have acquired great fortunes even in one year. In 1734, the company petitioned the king, that they might be allowed to dispose of the trade and tonnage of their annual ship, on account of the little profit which they made by it, and to accept of such equivalent as they could obtain from the king of Spain.

In 1724, this company had undertaken the whale-fishery. Of this, indeed, they had no monopoly; but as long as they carried it on, no other British subjects appear to have engaged in it. Of the eight voyages which their ships made to Greenland, they were gainers by one, and losers by all the rest. After their eighth and last voyage, when they had sold their ships, stores, and utensils, they found that their whole loss, upon this branch, capital and interest included, amounted to upwards of 237,000l.

In 1722, this company petitioned the parliament to be allowed to divide their immense capital of more than 33,800,000l. the whole of which had been lent to government, into two equal parts: The one-half, or upwards of 16,900,000l. to be put upon the same footing with other government annuities, and not to be subject to the debts contracted, or losses incurred, by the directors of the company, in the prosecution of their mercantile projects; the other half to remain, as before, a trading stock, and to be subject to those debts and losses. The petition was too reasonable not to be granted. In 1733, they again petitioned the parliament, that three-fourths of their trading stock might be turned into annuity stock, and only one-fourth remain as trading stock, or exposed to the hazards arising from the bad management of their directors. Both their annuity and trading stocks had by this time, been reduced more than 2,000,000l. each, by several different payments from government; so that this fourth amounted only to 3,662,784l. 8s. 6d. In 1748, all the demands of the company upon the king of Spain, in consequence of the Asiento contract, were by the treaty of Aix-la-Chapelle, given up for what was supposed an equivalent. An end was put to their trade with the Spanish West Indies, the remainder of their trading stock was turned into an annuity stock, and the company ceased in every respect to be a trading company.

This company is under the direction of a governor, sub-governor, deputy-governor, and 21 directors; but no per-

Company. son is qualified to be governor, his majesty excepted, unless such governor has in his own name and right, 5000l. in the trading stock; the sub-governor is to have 4000l. the deputy-governor 3000l. and a director 2000l. in the same stock. In every general court, every member having in his own name and right 500l. in trading stock, has one vote; if 2000l. two votes; if 3000l. three votes; and if 5000l. four votes.

2. *The East India Company.* The first, or as it is called the *Old East India Company*, was established by a charter from Queen Elizabeth in 1600; but for some time the partners seem to have traded with separate stocks, though only in the ships belonging to the whole company. In 1612, they joined their stocks into one common capital: and though their charter was not as yet confirmed by act of parliament, it was looked upon in that early period to be sufficiently valid, and no body ventured to interfere with their trade. At this time their capital amounted to about 740,000l. and the shares were as low as 50l: their trade was in general successful, notwithstanding some heavy losses, chiefly sustained through the malice of the Dutch East India Company. In process of time, however, it came to be understood that a royal charter could not by itself convey an exclusive privilege to traders, and the company was reduced to distress by reason of the multitude of interlopers who carried off the most of their trade. This continued during the latter part of the reign of Charles II. the whole of that of James II. and part of William III. when in 1698 a proposal was made to parliament for advancing the sum of 2,000,000l. to government, on condition of erecting the subscribers into a new company with exclusive privileges. The old company endeavoured to prevent the appearance of such a formidable rival, by offering government 700,000l. nearly the amount of their capital at that time; but such were the exigencies of the state at that time, that the larger sum, though at eight per cent. interest, was preferred to the smaller at one half the expence.

Thus were two East India Companies erected in the same kingdom, which could not but be very prejudicial to each other. Through the negligence of those who prepared the act of parliament also, the new company were not obliged to unite in a joint-stock. The consequence of this was, that a few private traders, whose subscriptions scarce exceeded 7200l. insisted on a right of trading separately at their own risk. Thus a kind of third company was established; and by their mutual contentions with one another, all the three were brought to the brink of ruin. Upon a subsequent occasion, in 1730, a proposal was made to parliament for putting the trade under the management of a regulated company, and thus laying it in some measure open. This, however, was opposed by the company, who represented in strong terms the mischiefs likely to arise from such a proceeding. "In India (they said), it raised the price of goods so high, that they were not worth the buying; and in England, by overstocking the market, it sunk the price to such a degree that no profit could be made of them." Here Dr Smith remarks, that by a more plentiful supply, to the great advantage and conveniency of the public, it must have reduced very much the price of India goods in the

English market, cannot well be doubted; but that it should have raised very much their price in the Indian market, seems not very probable, as all the extraordinary demand which that competition could occasion, must have been but as a drop of water in the immense ocean of Indian commerce. The increase of demand, adds he, though in the beginning it may sometimes raise the price of goods, never fails to lower it in the issue. It encourages production, and thereby increases the competition of the producers, who, in order to undersell one another, have recourse to new divisions of labour and new improvements of art, which might never otherwise have been thought of. The miserable effects of which the company complained, were the cheapness of consumption and the encouragement given to production, precisely the two effects which it is the business of political economy to promote. The competition, however, of which they gave this doleful account, had not been allowed to continue long. In 1702 the two companies were, in some measure, united by an indenture tripartite, to which the queen was the third party; and in 1708, they were, by act of parliament, perfectly consolidated into one company by their present name of "The United Company of Merchants trading to the East Indies." Into this act it was thought worthy to insert a clause allowing the separate traders to continue their traffic till Michaelmas 1711, but at the same time empowering the directors, upon three years notice, to redeem their capital of 7200l. and thereby convert the whole capital of the company into a joint-stock. By the same act, the capital of the company, in consequence of a new loan to government, was augmented from 2,000,000l. to 3,200,000l. In 1743, another million was advanced to government. But this being raised, not by a call upon the proprietors, but by selling annuities and contracting bond-debts, it did not augment the stock upon which the proprietors could claim a dividend. Thus, however, their trading stock was augmented; it being equally liable with the other 3,200,000l. to the losses sustained, and debts contracted, by the company in the prosecution of their mercantile projects. From 1708, or at least from 1711, this company being freed from all competitors, and fully established in the monopoly of the English commerce to the East Indies, carried on a successful trade; and from their profits made annually a moderate dividend to their proprietors. Unhappily, however, in a short time, an inclination for war and conquest began to take place among their servants; which, though it put them in possession of extensive territories and vast nominal revenues, yet embarrassed their affairs in such a manner, that they have not to this day been able to recover themselves. The particulars of these wars are given under the articles BRITAIN, and INDOSTAN. Here it will be sufficient to observe, that they originated during the war in 1741 through the ambition of M. Duplex the French governor of Pondicherry, who involved the company in the politics and disputes of the Indian princes. After carrying on hostilities for some time with various success, they at last lost Madras, at that time the principal settlement in the East Indies, but it was restored by the treaty of Aix-la-Chapelle. During the war of

Company. of 1755, they acquired the revenues of a rich and extensive territory, amounting, as was then said, to near 3,000,000l. per annum.

For several years they remained in quiet possession of the revenue arising from this territory, though it certainly never answered the expectations that had been formed concerning it. But in 1767 the British ministry laid claim to the territorial possessions of the company, and the revenue arising from them, as of right belonging to the crown; and the company, rather than yield up their territories in this manner, agreed to pay government a yearly sum of 400,000l. They had before this gradually augmented their dividend from about six to ten per cent.; that is, on their capital of 3,200,000l. they had raised it from 192,000l. to 320,000l. a-year. About this time also they were attempting to raise it still further, viz. from 10 to 12½ per cent.; but from this they were prevented by two successive acts of parliament, the design of which was to enable them to make a more speedy payment of their debts, at this time estimated at more than six or seven millions Sterling. In 1769 they renewed their agreement with government for five years more, stipulating, that during the course of that period they should be allowed gradually to augment their dividend to 12½ per cent.; never increasing it, however, more than one per cent. annually. Thus their annual payments could only be augmented by 608,000l. beyond what they had been before their late territorial acquisitions. By accounts from India in the year 1768, this revenue, clear of all deductions and military charges, was stated at 2,048,747l. At the same time they were said to possess another revenue, arising partly from lands, but chiefly from the customs established at their different settlements, amounting to about 439,000l. The profits of their trade, too, according to the evidence of their chairman before the house of commons, amounted to at least 400,000l. per annum; their accountant made it 500,000l.; and the lowest account stated it at least equal to the highest dividend paid to their proprietors. Notwithstanding this apparent wealth, however, the affairs of the company from this time fell into disorder; insomuch that in 1773 their debts were augmented by an arrear to the treasury in the payment of the 400,000l. stipulated; by another to the customhouse for duties unpaid; by a large sum borrowed from the bank; and by bills drawn upon them from India to the amount of more than 1,200,000l. Thus they were not only obliged to reduce their dividend all at once to six per cent. but to apply to government for assistance. A particular account of this transaction is given under the article BRITAIN. Here it may be mentioned in general, that the event proved very unfavourable to the company, as they were now subjected to an interference of government altogether unknown before. Several important alterations were made in their constitution both at home and abroad. The settlements of Madras, Bombay, and Calcutta, which had hitherto been entirely independent of one another, were subjected to a governor-general, assisted by a council of four assessors. The nomination of the first governor and council, who were to reside at Calcutta, was assumed by parliament; the power of the court of Calcutta, which had gradual-

ly extended its jurisdiction over the rest, was now reduced and confined to the trial of mercantile causes, the purpose for which it was originally instituted. Instead of it a new supreme court of judicature was established, consisting of a chief justice and three judges to be appointed by the crown. Besides these alterations, the stock necessary to entitle any proprietor to vote at the general courts was raised from 500l. to 1000l. To vote on this qualification, too, it was necessary that he should have possessed it, if acquired by his own purchase and not by inheritance, for at least one year, instead of six months, the term requisite formerly. The court of 24 directors had before been chosen annually; but it was now enacted, that each director should for the future be chosen for four years; six of them, however, to go out of office by rotation every year, and not to be capable of being rechosen at the election of the six new directors for the ensuing year. It was expected that, in consequence of these alterations, the courts both of the proprietors and directors would be likely to act with more dignity and steadiness than formerly. But this was far from being the case. The company and its servants showed the utmost indifference about the happiness or misery of the people who had the misfortune to be subjected to their jurisdiction. This indifference, too, was more likely to be increased than diminished by some of the new regulations. The house of commons, for instance, had resolved, that when the 1,600,000l. lent to the company by government should be paid, and their bond debts reduced to 1,500,000l. they might then, and not till then, divide eight per cent. upon their capital; and that whatever remained of their revenues and nett profits at home should be divided into four parts; three of them to be paid into the exchequer for the use of the public, and the fourth to be reserved as a fund, either for the further reduction of their bond-debts, or for the discharge of other contingent exigencies which the company might labour under. But it could scarce be expected that, if the company were bad stewards and bad sovereigns when the whole of their nett revenue and profits belonged to themselves, they would be better when three-fourths of these belonged to other people. The regulations of 1773, therefore, did not put an end to the troubles of the company. Among other institutions, it had been at this time enacted, that the presidency of Bengal should have a superiority over the other presidencies in the country; the salary of the chief justice was fixed at 8000l. per annum, and those of the other judges at 6000l. each. In consequence of this act, Sir Elijah Impey, who was created a baronet on the occasion, set sail, with three other judges, for India in the year 1774. The powers with which they were invested were very extraordinary. They had the title of His Majesty's Supreme Court of Judicature in India. Civil law, common law, ecclesiastical, criminal, and admiralty jurisdiction, belonged of right to them. They were empowered to try Europeans on personal actions, and to assess damages, without a jury. Every native, either directly or indirectly in the service of the company, or in their territories, was made subject to their jurisdiction, with a view to prevent the Europeans from eluding justice under the pretence of employing

Company. ploying natives in the commission of their crimes; so that in fact they were absolute lords and sovereigns of the whole country.

Such excessive and unlimited powers conferred on any small number of men, could not but be extremely disagreeable to the Europeans, who had been accustomed to enjoy a liberty almost equally unbounded before; nor was it to be supposed that the judges, thus suddenly raised from the rank of subjects to the height of despotism, would always use their power in an unexceptionable manner. The design of the establishment was to preserve the commerce and revenues of the company from depredation, by subjecting its servants to the controul of the court; to relieve the subject from oppression by facilitating the means of redress; and to fix a regular course of justice for the security of liberty and property. Instead of considering the circumstances of the country, however, or the manners and customs of the natives, the judges now precipitately introduced the British laws in their full extent, without the least modification to render them agreeable to the Asiatics, who had been accustomed to others of a quite different nature; nor did they even pay the least regard to the religious institutions or habits to which the Indians are so obstinately attached, that they would sooner part with life itself than break through an article of them.

Besides this it was said, that, on the first arrival of the judges, they endeavoured to extend their authority beyond even what the British legislature had allowed them. Hence they were frequently at variance with the council; and complaints of their conduct were repeatedly sent to England by the servants of the company. These produced a letter in 1777 from the directors to Lord Weymouth, secretary of state for the southern department. In this they stated, that the supreme court of India had extended its jurisdiction to those whom it did not appear to have been the intention of the king or parliament to subject to its authority. It had also taken cognizance of matters which, they apprehended, belonged properly to other courts. That the judges considered the criminal law of England as in force, and binding on the natives of Bengal, though utterly repugnant to the laws and customs by which they had hitherto been governed; and that the jurisdiction exercised by the supreme court was incompatible with the powers given by parliament to the governor-general and council, obstructed the administration of government, and tended to alienate the minds of the natives; all which they feared would prevent the establishment of the government of India upon any settled or permanent foundation.

This letter not having produced any effect, the disorders of India, both in the Europeans and natives, continued and increased. The decisions of the judges were such as by no means did them honour. A number of adventurers had also emigrated along with them, in hopes of enriching themselves under the new constitution. Some of these were of the lowest sort of people, who had rendered it in a manner impossible for them to remain in England on account of their vices or extravagance. Many such persons had enrolled themselves among the domestics of the judges, or had become their immediate dependents; and some of these were permitted to assume the charac-

ters of attorneys, court-officers, under-sheriffs, and Company- bailiffs. It may easily be supposed, that people of such characters would find it for their interest to promote suits in the supreme court: and in this some of them employed themselves with great success. The consequence of all this was, that on the 4th of December 1780, a petition was presented against the supreme court by a great number of British inhabitants in the kingdoms of Bengal, Bahar, and Orisa. In this, complaint was made of the indiscriminate manner in which the judges of the supreme court attempted to exercise the English laws in that country, at the same time that they refused the undoubted right of every British subject, viz. that of trial by jury. They intreated the house "to reflect on the innumerable hardships which must ensue, and the universal confusion which must be occasioned, by giving to the voluminous laws of England a boundless retrospective power in the midst of Asia, and by an application of those laws made for the freest and most enlightened people on earth, the principle of whose constitution was founded on virtue and liberty, to transactions with the natives of India, who had, from time immemorial, lived under a despotic government, founded on fear and restraint. What must be the terrors of individuals to find their titles to property, and their transactions with the natives previous to the establishment of this court of judicature, tried by the standard of the English law, and by men educated under its forms, and unavoidably imbibing its prejudices, when no such laws could be known to or practised by natives or Europeans then residing in the country, and that at a time when there were few persons of legal knowledge in the country to advise or assist them? No tyranny could be more fatal in its consequences, than that a court, invested with all the authority of one of the first courts in England, should also possess undefined powers and jurisdiction, of which its judges were the sole interpreters, and at such an immense distance from the mother country. This was in truth the situation of the British subjects in India at that time; for the judges of the supreme court could at pleasure determine on the denomination of a civil jury, the degree of guilt incurred by any offence, the statute by which it should be tried, what penalties should be inflicted, as well as who were and who were not amenable to the jurisdiction of the court.

"Besides their other powers also, the judges of the supreme court were allowed to sit as a court of chancery, and in that capacity to revise, correct, rescind, or confirm the decisions passed by themselves as a court of law; and, by another part of their constitution, they were allowed to stop execution in criminal cases until his majesty's pleasure was known. The petitioners conceived, that there must be some fundamental error in that constitution, which required a more than ordinary degree of temper, integrity, and ability, to carry its purposes into execution; and they did not hesitate to declare, that to administer the powers appertaining to the institution of the supreme court, without committing flagrant acts of injustice, and doing great detriment to the public, required more equity, moderation, discernment, and enlightened abilities, than they could hope to find in any set of men." They concluded with earnestly soliciting parliament, that a trial
by

Company. by jury might be granted to the British subjects in Bengal, in all cases where it was established by law in England; that the retrospective powers of the supreme court might be limited to the time of its establishment in Bengal; that it should be defined beyond the power of discretionary distinction who the persons were that properly came under the jurisdiction of the court, and who did not; that it should be expressly declared what statutes should, and what should not, be in force in Bengal; that distinct and separate judges for the law and equity sides of the court should be appointed; and that a power of delaying executions in criminal cases until his majesty's pleasure was known, should be lodged in the governor and council.

This petition was soon followed by another signed by Warren Hastings, Esq. governor-general, Philip Francis and Edward Wheeler, Esqs. counsellors for the government and presidency of Fort-William in Bengal; in which they represented, "that, though the jurisdiction of the supreme court of judicature at Calcutta, as well as the powers granted to the governor-general and council, were clearly limited by parliament and the king's letters patent, yet the chief justice and judges of that court had exercised authority over persons not legally within their jurisdiction, and had illegally and improperly advised and admitted suits against the governor-general and council: that they had attempted to execute their writs upon natives of high rank in the kingdom of Bengal, who were not within their jurisdiction: the governor and council therefore had found themselves under a necessity of opposing them, and of affording protection to the country and people, who were placed under their own immediate inspection, and freeing them from the terrors of a new and usurped dominion. They had even been obliged to make use of a military force, in order to resist the proceedings of the judges and their officers: And they declared, that no other conduct could have saved those provinces and the interests of the company, or of the British nation itself, from the ruin with which they were threatened. They also declared themselves to be of opinion, that the attempt to extend, to the inhabitants of these provinces, the jurisdiction of the supreme court of judicature, and the authority of the English law, which were still more intolerable than the law itself, would be such a restraint on the minds of the people of those provinces, by the difference of such laws and forms from their laws, that they might at last inflame them, notwithstanding their known mildness and patience, into an open rebellion." The petition was concluded, by soliciting an indemnity from the legal consequences of the resistance they had been obliged to make to that court.

While the British were thus expressing their displeasure against the conduct of these judges, the natives were thrown into the utmost consternation and despair by the acts of oppression and violence committed by them. A prosecution for forgery had been commenced against Nundcomar, a brahin of the first rank in Bengal. The crime was not capital by the laws of Indostan, and had been committed many years before; yet with the utmost cruelty and injustice was this man condemned and executed on the British statute, by which forgery is made capital: a statute which, at the commission of the crime, he had

never heard of, nor could ever dream that he would be Company. subjected to its power. What rendered this execution the more remarkable was, that, at the very time when charge of forgery was brought against him, Nundcomar had been employed in exhibiting an accusation against Mr Hastings. This, together with the hurry in which the court were to have him put to death (for the court refused to allow him a respite till his majesty's pleasure was known,) made the natives conclude, that he was executed, not on account of the forgery, but for having ventured to prefer an accusation against an English governor. In other respects they were terrified to such a degree, that many of them ran into the river on seeing a brahin put to death with such circumstances of ignominy.

The alarm excited by the execution of Nundcomar was kept up by fresh decisions of the supreme court. Among those the Patna cause, as it is commonly called, was one of the most remarkable. An adventurer, named Shahaz Beg Cawn, had come from Cabul in Persia to Bengal, where he entered himself in the service of the company, and was preferred to the command of a body of horse. Having gained a competent fortune, and obtained from the Mogul a grant of lands called an *Ultumghaw* in the province of Bahar, he retired from the army, and settled in Patna. About this time, when advanced in years, he married a woman of low rank, named *Nadara Begum*, by whom he had no children. His brother, Allum Beg, came likewise to Patna; and on his leaving the place some time after, committed the care of one of his sons, named *Behader Beg*, to his brother Shahaz Beg Cawn. On the death of the latter in 1776, a dispute ensued concerning the inheritance betwixt the widow and Behader Beg. The widow having taken possession of the whole property of Shahaz, the nephew, as adopted son and heir, gave in a petition to the provincial council at Patna, on the 2d of January 1777, setting forth his claim. In this petition he stated, that the widow was removing and secreting the effects of the deceased; and concluded with a prayer, that orders should be given to prevent their removal; to recover such as had already been carried away; and that the *cadi* or Indian judge should be directed to ascertain his right. As the parties were Mahometans, the council of course referred the cause to the *cadi* and two mufties, the proper officers for determining it according to the established laws of the country. These having inquired into the matter, reported, that the title-deeds, on which the widow pretended to found her right, appeared to be forged; and that, even if they had appeared in the life-time of Shahaz, they were still informal, on account of a point of the Mahometan law, which requires, that to make deeds of gift valid, possession should be entered into at the time of executing or delivering them over; but that, as no possession of this kind had been given, the estate ought to be divided according to the Mahometan law; viz. one-fourth to the wife, and three-fourths to the nephew, as the representative of his father Allum Beg, who was considered as the more immediate heir of the deceased. This decision was confirmed by the council of Patna, with the following exception in favour of the widow, that the heir-at-law should pay her one-fourth of the rents of the *ultumghaw*, or royal grant, for

Company. for her support during life. The widow, however, refused to submit to the decision, or to deliver up the effects of her husband; in consequence of which compulsory methods were used; when, by the advice of some English lawyers, an action of trespass was brought, according to the law of England, against the *cadi* and two *muffies* for their proceedings against her, laying the damages at about 66,000*l.* sterling. This process being brought before the supreme court, was by them conducted in such a manner as must entail everlasting infamy on the actors. They began with obliging the *cadi* and *muffies* to find bail in no less than 40,000 pounds for their appearance, which was immediately given by the council at Patna. The supreme court then having entered into the merits of the cause, and decided the matter in the most rigorous manner, according to all the forms of English law, assessed the *cadi* and *muffies* in damages no less than 30,000*l.* sterling. Their houses and effects were seized by the sheriff's officers, and publicly put up to sale; the *cadi*, who was upwards of 60 years of age, and had been in office for many years with great applause, died on his way to the common gaol at Calcutta, to which the nephew and two *muffies* were conveyed, being a distance of no less than 400 miles from their former residence at Patna. A suit, however, was commenced against the widow, on account of having forged the title-deeds by which she claimed her husband's estate; but it was suppressed on account of some informality.

Another decision, by which the supreme court likewise incurred much censure, was that against Jaggernaut, the principal public officer of a Mahometan court at Dacca. The action was brought at the instigation of an English attorney, in behalf of one Khyne, a servant or messenger, who had been fined and imprisoned for a misdemeanor, in which Jaggernaut had concurred in virtue of his office as judge of the Nizamut (the name of the Mahometan court just mentioned). The sheriff-officers attempted to arrest the judge as he sat on the tribunal; which could not fail to produce much disturbance. Jaggernaut, with his officers, denied the authority of the supreme court over the Nizamut, and refused to comply with the writ. The English sheriff-officers proceeded to force; and a violent scuffle ensuing, Jaggernaut's father was wounded in the head with a sword by one of the under-sheriff's attendants, while his brother-in-law was very dangerously wounded with a pistol bullet by the under-sheriff himself. The immediate consequence of this was an absolute refusal of the judge to take cognizance of any criminal matters; and this was intimated in a letter from the council at Dacca to the English governor and council of India; wherein they declared that all criminal justice was at a stand.

The supreme court, having proceeded in this arbitrary and oppressive manner for some time, at length attempted to extend their jurisdiction over the hereditary zemindars of Bengal. These are a kind of tributary lords, or great landholders, who are answerable to the company for the revenues or rents of the districts; and excepting the circumstance of remitting their revenues to the company, have not the least connection with the English in any respect. At the time we speak of, however, a writ upon an action of debt was issued out to arrest one of these zemindars in his

palace. Timely notice, however, was given, by one of the company's collectors, of this attempt to the governor and council, and application made to protect a man of such quality from the disgrace of an arrest. They being unanimously of opinion that the zemindar was not within the jurisdiction of the court of Calcutta, desired him to pay no regard to the writ. The court, however, determined to enforce their process by a writ of sequestration; upon which the natives, who are superstitiously attached to their zemindars, rose in his defence, and insulted the sheriff's officers. The latter having obtained a reinforcement, the zemindar's palace was entered by 86 men armed with bludgeons, cutlasses, and muskets; the apartment of his women, always held inviolably sacred by the Asiatics, was broken open; his temple profaned; and the image, which was the object of his worship, put into a basket, and carried off with some common lumber. This roused the attention of the governor and council; who, from a full conviction of the ruinous tendency of these proceedings, determined at last to oppose it force by force. They accordingly sent a party of military to apprehend the sheriff's people, and they were all conducted prisoners to Calcutta. The judges ordered attachments against the officer who commanded the troops, and against two other servants of the company; while the governor and council endeavoured to justify their proceedings, by writing to England as already mentioned.

Besides all this, the natives themselves testified their disapprobation of the conduct of the supreme court in very strong terms. A petition to his Britannic majesty was sent by the natives of Patna; in which are the following remarkable passages: "When the ordinances of this court of judicature were issued, as they were all contrary to the customs, modes, usages, and institutions, of this country, they occasioned terror in us; and day by day, as the powers of this court have become more established, our ruin, uneasiness, dishonour, and discredit, have accumulated; till at last we are reduced to such a situation, that we consider death to us as infinitely preferable to the dread we entertain of the court: for from this court no credit, no character is left to us, and we are now driven to the last extremity. Several who possessed means and ability deeming flight as their only security, have banished themselves from the country; but bound as we are by poverty and inability, and fettered by the dearest ties of consanguinity, we do not all of us possess the means of flight, nor have we power to abide the oppression of this court."—"If, which God forbid! it should so happen, that this our petition should not be accepted, and should be rejected at the chamber of audience, those amongst us who have power and ability, discarding all affection for our families, will fly to any quarter we can; whilst the remainder, who have no means or ability, giving themselves up with pious resignation to their fate, will sit down in expectation of death."

These repeated complaints could not but be taken notice of in parliament. On the 12th of February 1781, General Smith made a motion in the house of commons, that the petition from the British inhabitants of Bengal, Bahar, and Orissa, should be taken into consideration by a select committee, consisting of 15 persons, chosen by ballot. In the introduction to his

Company. his motion, he stated briefly the bad conduct of the supreme court in the particulars already related; and concluded, that the affairs of Bengal required the immediate attention and consideration of parliament. The matter was accordingly debated; when, after various proposals, a motion was at length made by General Smith, for leave to bring in a bill "to explain and amend so much of an act passed in the 13th year of his present majesty, for the better regulation of the East India company, as related to the administration of justice in Bengal; and also to indemnify the governor and council of Bengal for having resisted by force of arms the execution of an order of the supreme court of judicature in that kingdom." Leave was accordingly given to bring in the bill. The house having resolved itself into a committee, Lord North observed, "that it had been much his wish that an agreement for the renewal of the company's charter had been made in an amicable manner; and that voluntary propositions should have come from themselves, offering terms for the benefit of the exclusive trade and the territorial acquisitions. No such terms, however, had been proposed, nor any agreement made. A negotiation had indeed taken place between him and the chairman and deputy-chairman; but the propositions made by them were neither such as the public might expect, nor had the company any right to them. With regard to the territorial possessions, he was clearly of opinion, that they of right belonged to the public; though how far it might be proper to allow the revenue of them to remain in the possession of the company was quite another matter. In his opinion, it would be proper to allow it to remain in their hands as long as they possessed an exclusive trade, but he never would consent to forego the claim of the public. He made a motion, therefore, "that it was the opinion of the committee, that three-fourths of the surplus of the nett profits of the East India Company, ever since the company's bond debt was reduced to 1,500,000*l.* and the company's dividends had been eight per cent. per annum, belong to the public; and that 600,000*l.* in lieu thereof, and in discharge of all claims on the part of the public, be paid into his majesty's exchequer by instalments, in such manner and at such times, as shall be agreed on." This proposal was vehemently opposed by the minority. Mr Burke called it the daring effort of a minister determined on rapine and plunder, without regard to truth, honour, or justice. Mr Hussey reproached the idea of taking 600,000*l.* from the company in their circumstances at that time. He produced a paper full of arithmetical calculations, which he read to the house; asserting that they contained an exact state of the amount of the company's exports and imports, the expences of their trade at home, and the balance of profit of each year, for many years past, distinguishing the territorial from the commercial income and expences. From these he showed, that the commercial and territorial revenues of the company had, upon an average for 16 years, constituted a sum equivalent to a proportion of 16 per cent.; that 9 per cent. of this had arisen from the commercial profits accruing to the company; and therefore, that there had not been 8 per cent. divided upon that part of the profits to which the public had any claim or pretension. The accession of territorial possessions, he observed, had

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brought along with it additional expences; and the public had already received a very large share of the company's profits. He declared it to be his opinion, that the company should always make it a rule to give as ample and full relief to the public burdens as their situation would allow; and if they did this, he saw no reason why the minister should expect any more. Mr Dempster reminded the house of the consequences of violating the American charters; and added, that to tear from the company by force what was not stipulated in any act of parliament, would be a breach of public faith disgraceful to the nation, and such as would damp the spirit of enterprise and adventure which had been productive of such happy effects.—Notwithstanding these remonstrances, however, the bill was at last passed into a law; only with this mitigation, that the company should pay only 400,000*l.* instead of 600,000*l.* demanded originally by the minister.—Another bill was also passed the same year, in consequence of the motion made by General Smith. This act declared, that the governor-general and council of Bengal were not subject to the jurisdiction of the supreme court, and indemnified the former for the resistance they had made to the orders of that court. It enacted also, that no person should be subject to the jurisdiction of that court on account of his being a landholder or farmer of land in the provinces of Bengal, Bahar, or Orissa; that no judicial officers in the country courts should be liable to actions in the supreme court for their decisions; and the two musties, with Behader Beg, who were then in prison, in consequence of the decision of that court in the Patna cause, were ordered to be set at liberty.

The debates on this subject were attended with the most violent charges against the minister, and assertions the most humiliating and disgraceful to the British nation. Mr Townshend affirmed, that it was from the minister's screening the delinquents who came from India that all the evils in that quarter had originated; and if matters were suffered to go on in that country as they had done for some time past, the conduct of the British in the East Indies must be viewed in a light still more detestable than that of the Spaniards in America. It was reported, that the nabob of Arcot had several members in the house of commons! If it were true, that by sending over a sum of money to England he could seat eight or ten members in that house, then Mr Townshend declared, that in his opinion they were the most abject and contemptible beings in the world.—The bill for regulating the powers of the supreme court, also, though so evidently founded in reason and justice, did not pass without opposition, particularly from Mr Dunning; who was thought on this occasion to have allowed his regard for his friend Sir Elijah Impey, the chief justice, to bias him too much.

The regulations just mentioned did not yet put an end to the troubles of the East India company, nor allay the ferment which had been so effectually excited. Their affairs were still a subject of parliamentary discussion; and in the month of April 1782, a motion was made by Mr Dundas, then lord advocate of Scotland, for taking into consideration the several reports concerning affairs, which had been made by the secret committee appointed to inquire into them during the last and

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present

Company. present session of parliament. In his speech on this occasion, he remarked, that the opinion of Lord Clive had been against keeping too extensive a territory in that country. Instead of this, he had restored Sujah Dowlah to the possession of his country; considering the British territories in Hindostan, with those on the coasts of Coromandel and Bombay, as sufficient for all the purposes by which this country could be benefited; but instead of adhering to the maxims of sound policy laid down by his lordship, they had become so ambitious of extending their territories, that they had involved themselves in a war with almost all India. He then considered the finances of the company. The revenue of Bombay, he said, fell short of the necessary civil and military establishment by 200,000*l.* a-year, which was annually drawn from Bengal. With regard to that of Madras, it appeared, on an average of 12 years, from 1767 to 1779, that there had been eight years of war and only four of peace; and that, during the whole time of war, the revenue had not been able to support the civil and military establishments; though, in time of peace, it was able to do nearly one-half more. Bengal, however, was the most lucrative of all the East India settlements; but such had been the expenses of the Mahratta war, that the governor-general had been obliged to contract a very large debt, inasmuch that it was doubtful whether the investments for England should be wholly or partially suspended. Mr Hastings, he said, had in many instances proved himself a very meritorious servant: but he wished that every one of their servants would consider himself as bound in the first place to prove a faithful steward to the company; not to fancy that he was an Alexander or Aurengzebe, and prefer frantic military exploits to the improvement of the trade and commerce of his country.—General Smith observed, that by the evidence produced to the committee, it appeared that there had been a variety of great abuses in India. Sir Elijah Impey, his majesty's chief justice in that country, had so far derogated from the character of a judge, as to accept of a place from the company; by which means he was brought under their controul, and consequently allowed himself to be deprived of that independency which he ought to possess as a judge. Justice had been so partially administered, that several worthy and respectable persons had been imprisoned, some had been ruined, and others died in jail. From all which considerations he moved, that the affairs of the company ought to be taken into consideration by a committee of the whole house. Some hints were thrown out by Mr Dundas, that the territorial possessions in the East ought to be taken from the company entirely, and put under the direction of the crown; but this was opposed by Mr Fox, as furnishing ministers with such ample means of corruption and undue influence, as might overthrow the constitution entirely. For this reason, he thought it would be more prudent to leave the appointment of its own servants to the company; but at the same time to keep a watchful eye over them, in order to be able to punish and remove those who should be found delinquent.

The house having resolved itself into a committee, a motion was made by General Smith, "That Warren Hastings, Esq; governor-general of Bengal, and Sir

Elijah Impey, the chief justice, appear to have been concerned, the one in giving, the other in receiving, an office not agreeable to the late act for regulating the company's affairs; which unjustifiable transaction was attended with circumstances of evil tendency and example." Resolutions were also passed for ascertaining more distinctly the powers of the governor-general and council of Bengal; and votes of censure against Laurence Sullivan, Esq. chairman of the East India Company, for having neglected to transmit to India an act for explaining and amending the act for regulating the affairs of the company, and for the relief of certain persons imprisoned at Calcutta. Among the number of this gentleman's transgressions, also, was his imposing an oath of secrecy on Mr Wilkes, one of the company's clerks; and especially his restraining him from giving information to a select committee of the house of commons.

Mr Dundas having made several motions tending to criminate Sir Thomas Rumbold, formerly governor of Bengal, a bill was brought in, and passed into a law, for restraining him and Peter Perring, Esq. from going out of the kingdom for the space of one year, for discovering their estates, &c. An address was also presented to the king, requesting him to recall Sir Elijah Impey from India, in order to answer for high crimes and misdemeanors. A number of other resolutions were now passed by the house, in consequence of motions by Mr Dundas, and which were founded on the reports of the secret committee. Among these it was resolved, "That the orders of the court of directors of the East India Company, which have conveyed to their servants abroad a prohibitory condemnation of all schemes of conquest and enlargement of dominion, by prescribing certain rules and boundaries for the operation of their military force, were founded no less in wisdom and policy than in justice and moderation. That every transgression of these orders, without evident necessity, by any of the several governments in India, has been highly reprehensible, and tended in a great degree to weaken the force and influence, and to diminish the influence of the company in those parts. That every interference of the company as a party in the domestic or national quarrels of the country powers, and all new engagements with them in offensive alliance, have been wisely and providentially forbidden by the company in their commands to their administrations in India. That every unnecessary deviation from these rules should be severely reprov'd and punished. That the maintenance of an inviolable character for moderation, good faith, and scrupulous regard to treaty, ought to have been the simple grounds on which the British government should have endeavoured to establish an extensive influence, superior to that of other Europeans; and that the danger and discredit arising from the forfeiture of this pre-eminence, could not be compensated by the temporary success of any plan of violence and injustice. That should any relaxation take place, without sufficient cause, in those principles of good government on the part of the directors themselves, it would bring upon them, in a heavier degree, the resentment of the legislative power of their country. That the conduct of the company, and their servants in India, in various instances specified, was contrary

Company. to policy and good faith; the company's servants, in their presidency of Bombay, had been guilty of notorious instances of disobedience to the orders of their employers, particularly in forming an alliance with Ragobah, or Ragonaut Row: that they had undertaken, without any adequate military force, or certainty of a sufficient revenue, and without proper communication with the superior government upon which they were to depend for sanction and support, to reinstate the usurper above mentioned, and thereby to involve themselves in a war with the ruling ministers of the Mahratta state, while Ragobah himself was not in the mean time able to give the company any secure possession of the grants he had made to them for the purchase of their assistance. That it was the opinion of the house, that all the disasters in which the British empire in the East was involved had proceeded from the unjustifiable manner in which the Mahrattas had been treated, and the conduct of the Madras presidency in other respects specified. That it is the opinion of this house, that it must be reckoned among the additional mischiefs arising chiefly from the improvident war with the Mahrattas, that the military force of the Carnatic had been weakened by reinforcements sent to the Malabar coast: that the Bengal government had been under a necessity of supporting, on their confines, the army of a power confederated against them (A): that they had been under the necessity of suing for the mediation of the same power; and submitted to a refusal, and purchased at last an uncertain, because apparently an unauthorized, treaty, on most extravagant and dishonourable conditions, with Chimmagee the rajah of Berar's son: and, finally, that being burdened with the expences of a variety of distant expeditions, while their allies were in distress, and their tributaries under oppression, there was also an alarming deficiency in the resources of revenue and commerce, by the accumulation of their debt, and the reduction of their infestment. That it was the opinion of the house, that an attempt made by the governor-general, in the beginning of January 1781, to form an engagement of alliance, offensive and defensive, with the Dutch East India Company, in the manner stated by the proceedings of their council, was unwarranted, impolitic, extravagant, and unjust.

These severe censures extended even to the directors themselves, whose conduct on some occasions was declared to be indefensible, as well as that of their servants and agents. It was also resolved, "That Warren Hastings, Esq. governor-general of Bengal, and William Hornsby, Esq. president of the council of Bombay, having in sundry instances acted in a manner repugnant to the honour and policy of this nation, and thereby brought great calamities on India, and enormous expences on the India company, it was the duty of the directors to pursue all legal and effectual means for the removal of the said governor-general and president from their offices, and to recal them to Britain."

The commons having thus seriously entered into a consideration of East India affairs, soon found still

more abundant reason for censure. It was discovered, that corruption, fraud, and injustice, had pervaded every department. It had become an object with the servants of the company to oppress the natives by every possible method. They monopolized every article of trade, and seemed to have no other principle of commerce but lawless violence: the court of directors sent out instructions; but for the most part without any effect. Though the delegated administration of India ought to have preserved the strictest obedience to that of Britain; yet, being at so great a distance from the seat of supreme authority, and being possessed of endless means of abuse, it had become corrupt in an extreme degree. Instead of being subservient to government at home, the administration of India affected independence. The maxims of Mr Hastings were arbitrary; and he seemed to have no inclination to obey. He treated with sovereign contempt the authority of the court of directors: and the confusion produced by the disputes between them were fostered by the body of India proprietors, who were disposed to act as a check upon the directors. The necessity of new regulations in the government of India was universally admitted; and a bill for this purpose was accordingly brought in by Mr Dundas. His propositions were, that the governor and council of Bengal should have a controuling power and jurisdiction over the inferior presidencies of India; and he was of opinion that the governor-general should be invested with a power to act even against the will and opinion of the council, whenever he should imagine that, by so doing, he could contribute to the public good; though, in these cases, he alone should be responsible for the event. With regard to the inferior governors, though he did not think it proper that they should be authorized to act contrary to the advice of the council, he was of opinion, that they ought to have a right of negating every proposition, until application was made to the governor-general and council of Bengal. With regard to the zemindaries, and other tenures of land, he observed, that when Hindostan had been conquered by the Moguls, a tribute was imposed upon the zemindars; and while they continued to pay this tribute, they accounted themselves to be the real proprietors and masters of the lands they possessed. The people called *ryots*, to whom these zemindaries were let out, considered themselves likewise as secure in their possessions while they performed the articles of their respective contracts. Of late, however, these rights had been infringed; and the Mogul came to consider himself as the absolute master of all the soil of Indostan; which maxim he was inclined to destroy, and erect upon it another, that might secure the landholders in their property. He proposed to secure the nabob of Arcot and rajah of Tanjore in their territories, by making an act of parliament in favour of the latter; but was of opinion, that the debts of these princes ought not to be too nicely inquired into, as the greatest part of them originated in corruption. He was clearly of opinion, however, that Governor Hastings ought to be recall-

(A) The power here alluded to was Movdajee Boofla, rajah of Berar. See INDOSTAN.

Company. ed; and that steps ought to be taken to prevent the court of proprietors from presuming to act in contradiction to parliament. Lord Cornwallis appeared to be the most proper successor to Mr Hastings. His personal honour, and that of his ancestors, were pledges for his good behaviour; and being independent in his fortune, he could have no view of repairing his estate out of the spoils of India; and from his profession, he could add to the character of governor that of commander in chief; he would not, however, insist on his name being filled up in the bill, as that would rest more properly with government.

Mr Hastings was defended by Governor Johnstone, who endeavoured to ridicule the arguments and proposals of Mr Dundas. He observed, to the honour of the former, that he had been able to conclude a peace with the Mahrattas; and while he enlarged on his talents for negotiation, he admired the resources with which he had supplied the expences of the war. It ought to be considered, that Mr Hastings was in a situation the most difficult, and that no man could have sustained it with more fortitude and ability. His enemies had dealt in insinuation and invective; but when the hour of trial came, they would find that their charges would be refuted with equal ease. He was defended also by Mr Dempster, who advised the house seriously to think before they passed a vote for the removal of Mr Hastings. His exertions had been extraordinary; and it would then be as ridiculous to supersede him, as it would have been to recal General Elliot, when the Spanish batteries were playing against Gibraltar. He was not, however, an advocate for all the measures of Mr Hastings; his errors might be numerous; but no censure of him should be established before they were pointed out and explained.

Mr Dundas having now obtained leave to bring in his bill, another was moved for by Sir Henry Fletcher, "That leave be given to bring in a bill to discharge and indemnify the united company of merchants trading to the East Indies, from all damages, interest, and losses, in respect to their not making regular payment of certain sums due to the public, and to allow farther time to such payment; to enable the company also to borrow a certain sum of money, and to make a dividend for the proprietors of four per cent. at midsummer 1783." He endeavoured to show, that the public had derived very considerable advantages from the company; that their dividend had been 8l. 4s. annually during the time of peace, and 7l. 15s. per cent. during war; they were by no means in a state of insolvency, as some members had endeavoured to prove, their present application proceeding only from a temporary embarrassment. A new dispute took place concerning Mr Hastings, who was warmly attacked by Mr Burke, and defended by Governor Johnstone. The former enlarged on the bloodshed, ravages, and rapacity, which had taken place in India. The established system of the servants of the company, he said, was rapine, and robbery. The Mahratta war was occasioned by their refusal to be robbed; the famine at Madras was occasioned by the misconduct of the English government in India; and he set forth in strong colours the manner in which the Indian princes and princesses had been plundered. He instanced, that Mr Hastings had raised 800,000l. in

Bengal by private loan; and used it as an argument Company. that the company had ceased to exist, and that their commerce was nothing more than an instrument for procuring immense fortunes to individuals, totally destitute of conscience or principle.

All this was excused by Governor Johnstone. He regarded the sum of 800,000l. as merely trifling, when the number of civil and military servants on the Bengal government was considered. The famine at Madras was owing to the modes of war which prevailed in the East; as the enemy there marked their course by desolation. He concluded with censuring the manner in which Mr Hastings had been spoken of; and insisted that his high reputation ought to have guarded him from such insults. Mr Burke replied by an intimation of his design to impeach Mr Hastings on his return; whom he called the greatest delinquent that had ever violated in India the rights of humanity and justice.

It was observed by Lord John Cavendish, that the territorial acquisitions of the company were a fruitful source of grievance; and it would have been more for their advantage to have confined themselves to their original character of merchants. However, as the territorial acquisitions had been obtained, it was proper to take means for their preservation; as otherwise they would not revert to the natives, but fall into the hands of our natural enemies the French.

In the house of peers the cause of the company was ably defended by Earl Fitzwilliam. He maintained, that their situation was desperate, and bankruptcy inevitable, unless relief was instantly afforded. A report of their being in an insolvent state had gone abroad; and nothing was better calculated to preserve and support their credit than a large dividend sanctioned by act of parliament. The expenditure on their settlements had far exceeded their revenue; of consequence their servants had drawn bills, which they were unable to answer without a temporary supply. Thus the existence of the company might be said to depend on the bill; and he hoped no objections could be raised strong enough to destroy it.

On the 18th of November 1783, Mr Fox proposed his celebrated East India bill, which for some time attracted the attention of the nation at large in a very considerable degree. By this it was intended to take from the India proprietors and directors the entire administration of their territorial and commercial affairs. It took from them also their house in Leadenhall-street, together with all books, papers, and documents; vesting the entire management, the appointment of all officers and servants, the rights of peace and war, and the disposal of the whole revenue, in the hands of certain commissioners. These were, in the first instance, to be appointed by the whole legislature, but afterwards by the crown; and were to hold their offices by the same tenure as the judges in England, viz. during their good behaviour; and could be removed only by an address from one of the houses of parliament. They were required to come to a decision upon every question within a limited time, or to assign a specific reason for their delay. They were never to vote by ballot; and, almost in every case, were to enter the reason of their vote in their journals. They were also to submit, once every six months, an exact state of their
accounts

Company. accounts to the court of proprietors; and at the beginning of every session, a state of their accounts and establishments to both houses of parliament. Their number was limited to seven; but they were to be assisted by a board of nine persons, each of them possessed of 2000*l.* company's stock; who, as well as the commissioners, were to be appointed in the first instance by parliament, and ever afterwards by the court of proprietors. They were also to be removable at the pleasure of any five commissioners, and were disqualified from sitting in the house of commons. The whole system of government thus proposed, was to continue for the space of three or five years.

This was accompanied with another bill, the professed design of which was to preclude all arbitrary and despotic proceedings from the administration of the company's territorial possessions. By this the powers of the governor-general and supreme council were ascertained more exactly than had hitherto been done: it deprived the governor-general of all power of acting independent of his council; proscribed the delegation of any trust; and declared every British power in the East incompetent to the acquisition or exchange of any territory in behalf of the company, to the acceding to any treaty of partition, the hiring out of the company's troops, the appointing to office any person removed for misdemeanour, or to the hiring out any property to a civil servant of the company. By this also monopolies were entirely abolished; and illegal presents recoverable by any person for his sole benefit. The principal part of the bill, however, related to the zemindars, or native landholders, who were now to be secured by every possible means in the possession of their respective inheritances, and defended in all cases from oppression. Lastly, a mode was presented for terminating the disputes between the nabob of Arcot and the rajah of Tanjore; disqualifying every person in the service of the company from sitting in the house of commons during his continuance in their service, and for a certain specified time after his demission.

During the course of the debates on this bill, Mr Fox set forth the affairs of the company as in the most desperate situation. They had asked leave, he said, the year before, to borrow 500,000*l.* upon bonds; had petitioned for 300,000*l.* in exchequer bills; and for the suspension of a demand of 700,000*l.* due to government for customs. He took notice also, that, according to an act of parliament still in force, the directors could not, by their own authority, accept bills to the amount of more than 300,000*l.*; under which circumstances it would no doubt surprize the house to be informed, that bills were now coming over for acceptance to the amount of 2,000,000*l.* It was evidently, therefore, and indispensably necessary, that government should interfere in the affairs of the company to save them from certain bankruptcy. He stated their actual debt at no less than 11,200,000*l.* while their stock in hand did not exceed 3,200,000*l.* There was therefore a deficiency of 8,000,000*l.*; a most alarming sum when compared with the company's capital. Unless speedily assisted, therefore, they must inevitably be ruined; and the ruin of a company of merchants so extensive in their concerns, and of such importance in the eyes of all Europe, could not

but give a very severe blow to the national credit. Company. On the other hand, the requisite assistance was a matter of very extensive consideration. It would be absolutely necessary to permit the acceptance of the bills to the above-mentioned amount; and to do this without regulating their affairs, and reforming the abuses of their government, would only be to throw away the public money.

The conduct of the company's servants, and of the company itself, was now arraigned by Mr Fox in the most severe terms; and their misconducts were pointed out under their following heads:

1. With regard to Mr Hastings.—The chairman of the committee had moved in the house of commons, that it was the duty of the company to recall that gentleman; to which motion the house had agreed. In obedience to this resolution, the directors had agreed that Mr Hastings should be recalled; but supposing this to be a matter rather beyond their jurisdiction, they had submitted their determination to a court of proprietors, who rescinded the resolution of the directors; and after this the whole affair came to be laid before the house of commons. In the mean time every thing was anarchy and confusion in the East, owing to this unsettled conduct with regard to the governor; as the whole continent had been made acquainted with the resolution of the house for recalling him, while that of the proprietors for continuing him in his office was kept a secret. The proprietors had also been guilty of another contradiction in this respect, as they had voted their thanks to Mr Hastings for his conduct in India. Hence Mr Fox was led to comment on the nature of the company's connexions with their servants abroad, as well as on the character of the company themselves. Among the former, he said, there were a few, who, being proprietors themselves, endeavoured to promote the trade of the company, and increase its revenues. The views of the rest were otherwise directed; and from the difference in speculation between the two parties, the former were inclined to support that governor who enabled them to make large dividends; and who, for that reason, after having speculated for his own advantage, was obliged to do the same for the benefit of the proprietors. The latter, therefore, could not better gratify their wishes, than by supporting a governor who had in his power so many opportunities of providing for his friends.

2. The next charge was against the servants of the company, whom he accused of a regular and systematic disobedience to the orders of the proprietors.—The supreme council of Bengal, he said, had resolved, in opposition to Mr Hastings, to send two gentlemen, Mr Fowke and Mr Bristow, the one to reside with the nabob of Oude, the other at Benares. Mr Hastings, however, refused to send them: the directors transmitted the most positive orders to carry the vote of the supreme council into execution; but still Mr Hastings disobeyed; alleging in his defence, that he could not employ persons in whom he had no confidence. Afterwards, however, Mr Hastings seemed to contradict himself in a very curious manner. He granted Mr Fowke a contract, with a commission of 15 per cent.; which, he observed, was a great sum, and might operate as a temptation to prolong the war.

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Company. "But (added he) the entire confidence I have in the integrity and honour of Mr Fowke, amounts to a full and perfect security on that head."

To this Mr Fox added some other instances of a similar kind; but though he supported these and the projected bill with all the argument and eloquence for which he is so remarkable, he found it impossible to make his scheme agreeable to the majority of the house. The strongest opponent was Mr William Pitt, who insisted chiefly on the two following topics. 1. Its infringement, or rather annihilation of the company's charter; and, 2. The new and unconstitutional influence it tended to create.—He owned indeed, that India stood in need of a reform, but not such a one as broke through every principle of justice and reason. The charter of the company was a fair purchase from the public, and an equal compact for reciprocal advantages between the proprietors and the nation at large; but if it was infringed in the manner proposed by the bill, what security could other trading companies have that they should not be treated in the same manner? nay, what security could there be for Magna Charta itself? The bill, he said, amounted to a confiscation of property. It had been suggested, indeed, that it was not a bill of disfranchisement, because it did not take from the proprietors their right to an exclusive trade; but this was not the only franchise of the proprietors. A freehold might have a franchise annexed to it, the latter of which might be taken away, and yet the property of the former remain; in which case it could not be denied that the freeholders would have great cause to complain. The case was exactly parallel with the India stock. Persons possessed of this to a certain amount, were entitled to a vote upon every important question of the company's affairs; and on this account the purchase-money was more considerable. But, by the bill in question, this privilege was to be taken away; which plainly amounted to a disfranchisement.

The great objection to this bill, however, seemed to be a suspicion that it was a scheme of Mr Fox to gratify his own personal ambition as a minister, he being at that time secretary of state. On this account he was deserted even by the patriotic members, who, upon former occasions, had so strenuously supported his cause.—Mr Dundas accused him of attempting to create a fourth estate in the kingdom, the power and influence of which might overturn the crown and subvert the constitution of Britain. A petition was presented from the proprietors, and another from the directors of the company, representing the bill as subversive of their charter, and confiscating their property, without either charge of delinquency, trial, or conviction. They prayed, therefore, that the acts of delinquency presumed against them might be stated in writing, and a reasonable time allowed them to deliver in their answer; and that they might be heard by counsel against the bill. About the same time the directors gave in a state of the company's affairs, differing in the most extraordinary manner from that given by Mr Fox. In this they represented the creditor side of the account as amounting to 14,311,173l. and they brought themselves in debtors to the amount of 10,342,692l.; so that of consequence there was a balance in their favour of 3,968,481l. This was

vehemently contested by the secretary, who said he Company. could bring objections to the statement of the directors to the amount of more than 12,000,000l. sterling. He then entered into a particular discussion of the articles stated in the directors account, and made good his assertion. Objections to his method of calculation, however, were made on the part of the company; so that nothing could certainly appear to the public but that the company were at that time much distressed, and would fail entirely unless powerfully supported by government.

Mr Fox now proceeded to a particular refutation of the arguments brought against the bill; in which indeed he displayed an astonishing force of argument and acuteness of reasoning. The objection drawn from the validity of the company's charter, he set aside, by showing that the company had abused their power, and that it was therefore necessary to take it from them. This he said always had been the case, and must be the case in a free nation; and he brought the example of James II. who, on account of the abuse of his power, had been deprived of it by the nation at large. The case was the same with the company. They had made a bad use of their power, and therefore the nation at large ought to deprive them of it. It had been objected by the country gentlemen, that the bill augmented the influence of the crown too much; and by Mr Dundas, that it reduced it to nothing. Both these objections, he said, were overturned by the circumstance of making the commissioners hold their office only during good behaviour. Thus, when conscious that they were liable to punishment if guilty, but secure in case they faithfully discharged their trust, they would be liable to no seduction, but would execute their functions with glory to themselves, and for the common good of their country and of mankind. He then drew a comparison betwixt his own bill and that of Mr Dundas's already mentioned. The bill of the latter, he said, had created a despotic authority in one man over some millions of his fellow-creatures; not indeed in England, where the remedy against oppression was always at hand; but in the East Indies, where violence, fraud, and mischief, everywhere prevailed. Thus the bill proposed by Mr Dundas afforded the most extensive latitude for malversation, while his own guarded against it with every possible care; as was instanced in its confiding in no integrity; trusting in no character; and annexing responsibility not only to every action, but even to the *inaction* of the powers it created.

After having expatiated for a considerable time, the secretary was seconded by Mr Burke, whose force of oratory was chiefly directed, as indeed it usually was when speaking of India affairs, on the monstrous abuse of the company's power in that quarter. He affirmed that there was not in India a single prince, state, or potentate, with whom the company had *come into contact*, whom they had not sold; that there was not a single treaty they had ever made which they had not broken; and that there was not a single prince or state that had ever put any confidence in the company who had not been ruined. With regard to the first article, Mr Burke instanced the sale of the Great Mogul himself; of the Rohillas; the nabob of Bengal; the polygars of the Mahratta empire; Ragobah the pre-
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Company. tender to that empire; and the subah of Decan.—The second article was proved by a review of the transactions from the beginning to the end of the Mahratta war. With regard to the third, viz. the ruin of such princes as put any confidence in the company or their servants, he desired them to look into the history and situation of the nabob of Oude. In the year 1779, this country had been visited by a famine; a calamity which had been known to relax the severity even of the most rigorous government: yet in this situation the president of Bengal had put an absolute negative upon the representation of the prince; adding, that perhaps expedients might be found for affording him a gradual relief; but their effects must be distant. This distant relief, however, never arrived, and the country was ruined.

Our limits will not allow a particular detail of the charges against the company on the one hand, or the defences on the other. In general, it must appear, that such severe and heavy charges could not be advanced without some foundation, though perhaps they may have been considerably exaggerated by the orators who brought them. The picture drawn by Mr Burke on this occasion indeed was shocking. “The Arabs, Tartars, and Persians, had conquered Indostan with vast effusion of blood; while the conquests of the English had been acquired by artifice and fraud, rather than by open force. The Asiatic conquerors, however, had soon abated of their ferocity; and the short life of man had been sufficient to repair the waste they had occasioned. But with the English the case had been entirely different. Their conquests were still in the same state they had been 20 years ago. They had no more society with the people than if they still resided in England; but, with the view of making fortunes, rolled in one after another, wave after wave; so that there was nothing before the eyes of the natives but an endless prospect of new flights of birds of prey and passage, with appetites continually renewing for a food that was continually wasting. Every rupee gained by an Englishman in India was for ever lost to that country. With us there were no retributory superstitions, by which a foundation of charity compensated, for ages, to the poor, for the injustice and rapine of a day. With us no pride erected stately monuments, which repaired the mischiefs pride had occasioned, and adorned a country out of its own spoils. England had erected no churches, no hospitals, no palaces, no schools (the trifling foundation at Calcutta excepted); England had built no bridges, made no high-roads, cut no navigations, dug no reservoirs. Every other conqueror of every other description had left some monument either of state or beneficence behind him; but were we to be driven out of India this day, nothing would remain to tell that it had been possessed, during the inglorious period of our dominion, by any thing better than the oran-outang or the tiger?”

All this eloquence, however, was at present entirely ineffectual, and the bill was finally rejected: much confusion and altercation ensued, which terminated in a change of ministry and dissolution of parliament. On the 26th of May 1784 a petition from the company was presented to the house of commons, praying for such relief as the nature of their affairs might seem to demand. This was followed on the 24th of June by

a bill for allowing the company to divide four per cent. Company. for the half year, concluding with midsummer 1784. This having passed, after some debate, a new bill was proposed by Mr Pitt for relieving the company in the mean time, and regulating their affairs in time to come. A bill to this purpose had been brought in during the last session of the former parliament by the same gentleman, which he wished to bring to a comparison with that of Mr Fox, of which an account has already been given. In this bill he began with laying it down as a principle, that “the civil and military government of India, or, in other words, the imperial dominion of our territories in the East, ought to be placed under other controul than that of the merchants in Leadenhall street; and this controul could be no other than the executive branch of the constitution. The commerce of the company, however, ought to be left as free from restrictions as possible; and, lastly, capricious effects from the government of India upon the constitution of Britain were to be carefully avoided. A controul in the executive branch of the legislature over the government of India had indeed been established by the regulation bill of 1773; but the former interference of ministers had not been beneficial, because it had not been active and vigilant. He now proposed, therefore, that a board should be instituted expressly for the purpose. This board was to be appointed by the king, and to consist of the secretary of state for the home department, the chancellor of the exchequer, and a certain number of the privy council. To this board the dispatches of the company were to be submitted, and were not to be sent to India until they were countersigned by them. To prevent questions concerning the commercial and political concerns of the company, it was proposed, that the dispatches upon the former subject should be submitted to the board; and that, in case of any difference, an appeal should be made to the king in council. Though he (Mr Pitt) had not thought proper to accept of the proposal of the company to yield the appointment of foreign councils to the crown, he was nevertheless clearly of opinion, that the commander in chief ought to be appointed by the king. He proposed also that this commander should have a vote in council next to the president; that the king should be empowered to bestow the reversion of his office; that the king might recal the governor-general, the presidents, and any members of their councils. He yielded the appointment of all officers, with the single exceptions he had stated, to the court of directors, subject, however, to the approbation of the king; and that, in case of a negative, the directors should proceed to a second choice, and so on. He deprived the court of proprietors of their privilege of rescinding or altering the proceedings of the court of directors: and with respect to the foreign government, he was of opinion, that their authority should comprise in it a considerable discretion, accompanied with the restraint of responsibility. He proposed, that there should be a revision of the establishments in India with a view to retrenchments; that appointments should take place by gradation; and that a new and summary tribunal should be erected for the trial of offences committed in that country. With regard to the zemindaries, though

Company. though he could not help paying a compliment to Mr Fox, on his intention of restoring them to their proper owners, he yet thought that a general and indiscriminate restitution was as bad as an indiscriminate confiscation. He therefore proposed, that an inquiry should be instituted for the purpose of restoring such as had been irregularly and unjustly deprived, and that they should in time to come be secured against violence.

In the bill of 1784 few alterations were made; and these uniformly tended to enlarge the powers of the board of controul. They were permitted, in cases of emergency, to concert original measures, as well as to revise, correct, and alter those of the directors. In matters relative to peace or war, where secrecy was a principal object, they were allowed to send their orders directly to India, without any communication with the directors; to the commander in chief without any communication with the presidencies; and the number of persons constituting the different councils of Bengal, Fort St George, and Bombay, was determined.—The governor-general and council of Bengal were to have an absolute power to issue orders to the inferior presidencies, in such cases as did not interfere with the directions already received from Britain; adding a power of suspension in case of disobedience. The supreme council were forbidden, unless any of the Indian princes should have first commenced or meditated hostilities, to enter upon war, or form an offensive treaty, without orders from home. The inferior councils were forbidden in all cases to form alliances; and in cases of urgency, were commanded to insert a provisional clause, rendering the permanency of the alliance dependent on the confirmation of the governor-general.

Various salutary regulations were proposed concerning the behaviour of the company's servants, against whom so great complaints had been made. Inquiry was ordered to be made by the different presidencies into the expulsions that might have been made of any of the hereditary farmers, and of the oppressive rents and contributions that might have been extorted from them; and measures were directed to be taken for their relief and future tranquillity. A similar examination was ordered into the different establishments in the Indian settlements; a report of which was to be laid annually before parliament. The company were prohibited from sending out a greater number of cadets or writers than what were absolutely necessary; and it was likewise provided, that the age of such as were sent out, should not be less than 15, nor more than 22 years. It was likewise provided, that promotions should be made in the order of seniority, unless in extraordinary cases; for which the presidencies should make themselves specifically responsible. Crimes committed by English subjects in any part of India, were made amendable to every British court of justice, in the same manner as if they had been committed in Britain. Presents, unless such as were absolutely ceremonial, or given to a counsellor at law, a physician, a surgeon, or a chaplain, were absolutely prohibited, under the penalty of confiscation of the present, and an additional fine at the discretion of the court. Disobedience of orders, unless absolutely necessary, and pecuniary transactions prejudicial to the interests of the company, were declared to be high crimes and misdemeanors. The com-

pany were forbidden to interfere in favour of any person legally convicted of any of the above crimes, or to employ him in their service for ever. The governors of the different presidencies were also permitted to imprison any person suspected of illicit correspondence, and were ordered to send them to England with all convenient speed. Every person serving, or who should hereafter serve in India, was also required, on his return to England, to give an exact account, upon oath, to the court of exchequer, of his property, within two months after his arrival; one copy of which was to be kept in the court of exchequer, and the other at the India-house. The board of controul, the court of directors, or any three of the proprietors whose stock should amount together to 1000l. were allowed to move the court of exchequer to examine the validity of the account. In case of an apparently well-founded accusation, the court of exchequer were allowed to examine the party upon oath, and even to imprison him until the interrogatories proposed to him should be answered. The whole property of a person who should neglect to give in such an account within the time limited, or who should have been guilty of a misrepresentation in that account to the amount of 2000l. sterling, was ordered to be confiscated; ten per cent. to be paid to the accuser, and the remainder to be equally divided between the public and the company. Every person who had once been employed in India, but had afterwards resided in Europe for five years, unless such residence had been expressly on account of his health, was declared incapable of ever being sent out to India again.

As a farther curb on the company's servants, the attorney-general or court of directors was authorized to file an information in the court of king's bench against any person for crimes committed in India. That court was empowered also to imprison or admit the accused to bail immediately. It was then ordered, that within 30 days a certain number of peers should be chosen by the house of lords, and of the members of the house of commons by that house, to constitute a court for the trial of the accused. The court was finally to consist of three judges appointed by the crown, four peers, and six members of the house of commons; and the accused had a right to a peremptory challenge. From this court there was no appeal; and it was empowered to adjudge the party incapable of ever serving the company; to punish by fine or imprisonment; and in order to proportion the fine to the property of the convict, the court of exchequer might, at the requisition of the attorney-general, or of the company, examine him upon oath concerning the sum he was worth. A refusal to answer was to be punished with confiscation of property, and imprisonment during pleasure.

With regard to the treatment of delinquents in India, Mr Pitt observed, that at that time we had it not in our power to punish them. Either a new process must therefore be instituted, or offences, equally shocking to humanity, and contrary to every principle of religion and justice, must be permitted to continue unchecked. Every person therefore who went hereafter, would know the predicament in which he stood; and would understand, that by so doing he agreed to give up some of the most valuable privileges of an Englishman:

Company. man: yet in this he would do no more than a very numerous and honourable body of men, the military, did daily, without the least hesitation, or the smallest impeachment of their character.

This bill, so tremendous in its appearance to the company's servants, was vehemently opposed by the minority. Mr Francis observed, that it went upon two principles, viz. the abuse of power abroad, and the want of it at home. To remedy these, Mr Pitt had proposed to augment the power abroad, and to diminish that at home. He condemned the unlimited power of the commissioners, and even pretended to suppose that there must have been some mistake in the structure of the clause; it being impossible to think that it was intended to set aside the directors at home and the government abroad, in order to throw the whole power into the hands of a military commander. Though he approved of the clause by which schemes of conquest and extension of territory were condemned, he remarked, that it was essentially defective in other respects; as alluding to facts and offences which were not described, and to criminals whom, so far from punishing, it did not venture to describe. With respect to the affair of presents, he confessed that his opinion was rather singular. He was for an unlimited prohibition to men in high stations; but in the ordinary transactions of business, he was of opinion that they were useful, without giving room for any just apprehensions. The government of India, as it was now constituted, was a government of favour, and not of justice; and nothing would be done for the natives unless the persons who forwarded their affairs were gratified. In the mean time, however, the exception in favour of presents of ceremony was founded upon ideas which he knew to be fallacious, and was even calculated to render the prohibition itself useless and ineffectual. For the purpose of receiving presents of ceremony, all occasions would be sufficiently solemn. He warmly censured also the power of imprisonment given to the respective presidencies, and he condemned the institution of the new court of judicature as unnecessary, arbitrary, and dangerous.

By Mr Fox the bill was so highly disapproved of, that he objected to the house going into a committee upon it. He endeavoured to show, that instead of diminishing, it was calculated to increase the calamities of the East; and instead of reforming, to perpetuate the abuses so much complained of. The board of controul, he said, provided for a weak government at home by a division of power; and if there were a receipt or a nostrum for making a weak government, it was by giving the power of contriving measures to one, and the nomination of the persons who were to execute them to another. The negative given to the commissioners operated as a complete annihilation of the company, and the chartered rights so much vaunted of. The bill was a scheme of dark and delusive art, and took away the rights of the company by slow and gradual sap. The first step was originally to contrive measures without the knowledge of the company; and the next, to convey orders secretly to India, at the very time perhaps that the commissioners were openly giving countenance to orders of a quite different tendency sent from the directors. With regard to the new tribunal, he considered it as in truth a screen for

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delinquents; since no man was to be tried but on the accusation of the company or of the attorney-general; in which case he had only to conciliate government in order to remain in perfect security.

The opposition of Mr Fox's party against this bill proved as fruitless as their efforts had been in favour of the other. The house divided on the speaker's leaving the chair; when the motion was carried by a majority of 215. Still, however, all parts of the bill were warmly debated. In the course of conversation upon this subject, Mr Dempster expressed a wish that the king could be requested to send over one of his sons to become sovereign of that country. We might then enter into a federal union, and enjoy all the benefits that could be derived from the inhabitants of the East by Europeans, viz. those of commerce. The clauses relative to the native princes and hereditary farmers were all withdrawn at the motion of Mr Dundas; and under the head of presents, the exception in favour of those of ceremony was withdrawn. That clause, which insisted on all persons returning from India to give an account of the value of their estates upon oath, was severely censured by Mr Dempster and Mr Eden; and after some debate was entirely withdrawn, as was also the idea of making the person take the oath when required by the board of controul. Mr Pitt then proposed, that persons who had passed five years in India, and accumulated no more than 5000*l.* for that time, or double that sum for the next five years, should be exempted from all prosecution on the score of their fortunes. But on a suggestion by Mr Atkinson, that, in case of sickness, it might not be practicable for a person arriving from India to give in an account upon oath in the space of two months; on which suggestion a power was granted to the court of exchequer for extending the term from time to time as they should think proper. It had been the original idea of the chancellor, that this jurisdiction should take place in twelve months; and it had been objected, that thus persons would be deprived of the trial by jury, without time being granted them to choose whether they would submit to the condition. Mr Pitt now moved, that no account upon oath should be required of any person who should arrive from India before the first of January 1787. This amendment was likewise censured by opposition, as holding out an indemnity to speculators, and a warning for them to return within the assigned period. It was remarked by Mr Sheridan, that by the bill before the house, a person who took the oath would be liable all his lifetime to a prosecution for perjury. He could therefore make no settlement of his fortune; he could not sell or mortgage his estate, as nobody would have any thing to do with a property which was still liable to contest and forfeiture. This representation produced another amendment, limiting the commencement of a prosecution to the period of three years. The clause prohibiting the return of any person to India under certain conditions, was also mitigated by two amendments from the chancellor; one of them exempting the officers of the king from its operation; and the other permitting the restoration of any person with the consent of the directors, and three-fourths of the court of proprietors.

With these amendments the bill finally passed the house

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house of commons on the 28th of July. On being carried up to the house of lords, it met with a very vigorous opposition; the principal speakers against it being Lord Stormont and the earl of Carlisle. The former animadverted upon the principle of seniority established by it; which he said was particularly ill-suited to the critical posture of affairs and our present situation in India; and he asserted, that had such a clause been in effect at the time that Lord Clive first entered into the company's service, there would not have been an inch of the territorial possessions at present belonging to this country. It would damp the ardour of emulation, check the rising spirit of the youth now in Asia, and that at a time when the most extraordinary talents were necessary to raise us from our inauspicious and ruined condition. He objected also to the power of recal in the board of controul; which, he said, was by no means a sufficient check upon the company's servants in India. The distance of time and place, he said, were so great, that a recal from India could not have the least effect. But these remonstrances had very little weight with the house: the bill being finally passed on the 9th of August.

Some years after this, however, a declaratory law was found necessary, in consequence of a controversy which had arisen between the board of controul and the company. It had been resolved, in the month of October 1787, when his majesty had reason to be alarmed, and to look with more than common anxiety to the safety and preservation of every part of the British dominions, to send out four additional regiments for the better protection of our Indian possessions; nor was the design taken up as a temporary, but with a view to a permanent, establishment of his majesty's troops in India. At that time, no unwillingness to receive the regiments on board the company's ships, and provide for their support in India, had been intimated by the court of directors; but, on the contrary, the measure had been considered as a wise one, and the suggestion of it had given universal satisfaction. Since, however, the threatening storm had been dispersed, far different sentiments prevailed. Some of the directors, at least, were of opinion, that unless they made a requisition to government for further military assistance, they had it in their option to bear, or to refuse to bear, the expence of any additional regiments of his majesty's army which might be sent to India; and this opinion seemed to be, in a great measure, grounded on the act of 1781, by which the East India Company were bound to pay for such of his majesty's troops as had, by their requisition, been sent to India. This idea had been much agitated without doors, and the directors had thought proper to consult different counsel of eminence on the subject.

In this business two questions naturally arose:—First, Whether the king had a right to send his troops to any part of his dominions? and, secondly, If he sent them to India, who ought to defray the expence? That his majesty had an undoubted right, by his royal prerogative, to direct the distribution of his army, no one could, with any colour of reason, dispute. The only point, therefore, which offered itself for discussion was, whether, if his majesty, by virtue of his prerogative, thought proper to send four additional regiments

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to India, the expence of sending them, and their support, ought to be provided for out of the revenues of India, which they protected? It was certainly the opinion of ministers, that by the act of 1784, the authority and power of the court of directors, touching the military and political concerns of India, and also the collection, management, and application of the revenues of the territorial possessions, was transferred to the board of controul, which might direct the appropriation of these revenues in the manner that to them should appear to be most for the public advantage; but as doubts had been entertained by others, and the opinions of counsel, confirming those doubts, had been taken, all of which had gone abroad into the world, it was considered as a necessary measure to call upon the different branches of the legislature to remove those doubts in the most effectual way by a bill. It was certainly very evident, that, on the present occasion, the four regiments might, on board the company's ships, be sent out to India at a very inconsiderable expence; whereas, if transports had been specially provided for that purpose, the expence must have been enormous. To oblige the company, therefore, to pay the expence out of their Indian revenues, as had already been intimated to them by the commissioners of controul, the chancellor of the exchequer moved, on the 5th of February 1788, "That leave be given to bring in a bill for removing any doubts respecting the power of the commissioners for the affairs of India."

In explanation of this bill, and in answer to the remarks of opposition, Mr Pitt desired to remind the house that he had provoked the discussion of the bill, and had earnestly solicited them to bring it to the test of the most severe and scrupulous investigation. He found that it would be disputed, whether by the act of 1784 the board of controul had any right of superintendance over the revenue. Would it be contended that parliament meant to leave the finances in the hands of the company, who had been declared unfit to be trusted with them? Was it likely, that, when they provided for the better management of the political and military concerns, they had paid no attention to the circumstance upon which these concerns inseparably depended? The board of controul had already proceeded to reduce the enormous establishments in India; their right of interference in that respect had never been questioned; and what indeed would be the consequence of denying this right? The court of directors, if they had it in their power, as the expiration of their charter drew near, and it was doubtful whether their monopoly would be renewed, would certainly make it their first object to swell the amount of their imports, and would neglect the care of the territorial and political state of India. The duty of administration was to look, first, to the prosperity and happiness of the natives; secondly, to the security of the territorial possessions; thirdly, to the discharge of the debts due to the persons who had advanced their money, and enabled the company to struggle with their late difficulties; and, in the last place, to the commercial benefit of the proprietors. Was it probable that the court of directors would act upon that scale? Could it have been intended to confide in their discretion? It had been said, that the powers attributed to

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Company. the board of controul were the same in substance as had before been given to the secretaries of state and the lords of the treasury. But the fact was otherwise. The court of directors had been obliged to communicate their dispatches previous to their going to India; but there was no obligation upon the secretary of state to give any directions concerning them. The responsibility had ordinarily rested, under the former government, with the court of directors; under the present it was wholly vested with the board of controul.

An objection had been stated, that the declaratory bill conveyed to the king the power of maintaining an army without the consent of parliament. No proposition (Mr Pitt observed) could be more adverse to his intentions than that which was thus imputed to him. But in reality the troops in question had already been recognised by parliament when they voted the estimate for raising them; and the number of king's regiments serving in India would always be to be ascertained by the company belonging to each, which remained in England for the purpose of recruiting, and the expence of which would be to be provided for by parliament.

Mr Pitt acknowledged, that it had been the object of the act of 1784 to assume the power of superintendance and controul, without assuming the power of patronage. In the present bill he declared, that every thing had been done which his understanding had suggested for the diminution of patronage. The regiments in question belonged to the crown; and of course it could not be supposed that the sovereign could entirely depart from his prerogative of naming his own officers. But the king had acted with the most gracious attention to the company, and to the merits of the officers who had grown gray in their service; having relinquished nearly half the patronage of the regiments, and leaving the disposal of these commissions to the court of directors. The company indeed alleged that they had 600 officers unemployed; but the king could not forget that he had 2800 officers upon half-pay, not perhaps more meritorious, but certainly not less so, than those in the company's service, and many of whom had actually served with distinction in India. Such had been the forbearance he had thought it proper to exercise upon the subject of patronage. But if, by the objection that had been stated, it was intended to refer to the great political patronage, this he did not deny that he had at all times intended to assume. Men who were responsible for the government of a country, ought undoubtedly to have the appointment of those whom they were to entrust with the execution of their orders. But it would be admitted that the patronage left to the company was very considerable, when the great extent of their military establishment was properly recollected. Mr Pitt added, that the objections that were stated on this head would possibly throw difficulties in the way of the consolidation of the two armies in India; an object on many accounts desirable, and which in some way or other must be attempted. If it should be thought advisable to make the whole army royal, then undoubtedly the patronage of the crown would be greatly increased. He believed, however, that the measure was necessary; and there was scarcely any thing to which

he would not assent, to remove the apprehensions of the nation respecting the undue use of this patronage. For the bill now before the house, Mr Pitt professed himself ready to propose clauses that should annihilate every suspicion of danger.

The speech of Mr Pitt produced a favourable effect upon the country gentlemen; and the clauses which he had alluded to being moved, were received without any debate. These provided, That no king's troops, beyond the number which was now proposed, should be sent to India under the authority of any existing law: That no increase of salary should be given to any of the servants of the company, without the dispatches for that purpose being laid before both houses of parliament thirty days previous to their being sent; and that no gratuity should be given, the proposal for which did not originate with the court of directors. A fourth clause was added to these by the minister, which had not precisely the same object: it directed, that an account of the revenues and disbursements of the company should be laid before parliament at a certain assigned period in the course of every year.

The bill was carried up to the house of lords on the 14th of March, read a first time on the following day, which was Saturday, and proposed for a second reading on the ensuing Monday. This precipitation was made the subject of a petition, offered by certain proprietors, and presented to the house by the duke of Norfolk, in which they requested a delay of three days, till a general meeting could be held of the proprietors of the East India company. To this suggestion it was objected by Lord Thurlow and Lord Hawkesbury, that the ships of the East India company were now detained in port at the enormous expence of three or four hundred pounds per diem. By Lord Stormont and Lord Loughborough it was replied, that no expence, however great, ought to weigh in the consideration of the present question. The bill decided upon a matter of private right, and parliament could not justly refuse to hear the petitioners. The house divided upon the question, contents 32, not-contents 75. A motion of Lord Porchester was rejected by a similar majority, for referring a question to the twelve judges respecting the true meaning and intent of the act of 1784.

The duke of Richmond said, that he was peculiarly circumstanced on the present occasion, since he had never been pleased with any of the bills for the government of India that had yet been brought into parliament. He had ever been of opinion, that the concerns of the East were trusted in the best hands when they were vested in the company itself. He had opposed the bill of 1783, because it flagrantly violated the charter of the company, and placed an immense power in the hands of a commission, that was not responsible, so far as he could find, either to the king or the parliament. He had opposed the act of 1784, because it gave to the crown an enormous addition of power. But he could not admit that the act was in any degree so violent and despotical as the bill which preceded it. The declaratory measure now under consideration must necessarily have his complete approbation. It consisted of two distinct parts; its exposition of the act of 1784, and certain enacting clauses

Company. containing checks and restraints upon the extensive patronage that the government of the East naturally gave. To the former part he must inevitably agree. That the act of 1784 gave to the board of controul complete authority, had always been his opinion. For that reason he had opposed it: but entertaining that opinion, he must justify the present bill, which in his mind was a true declaration of the fact. He could not but equally approve of the restraints that were proposed upon the exercise of patronage. Patronage was inseparable from power. But when he saw the industry with which it was limited, and ministers were tied down from the abuse of it; when he saw that it was not to be used otherwise than for the good of the service, he could not view the present measure with the same jealousy with which he was accustomed to regard propositions for extending the power of the crown.

The bill, however, underwent a severe discussion in this as it had done in the other house; but at length passed.

In May following a petition was presented to the house of commons by the company, stating certain pecuniary embarrassments which they apprehended to take place on the first of March 1790, owing to the arrears of the war, to the government claim of 500,000*l.* to the debt incurred in China, and to the advances necessary to be made for the purposes of the China trade. In compliance with their petition Mr Pitt moved on the following day that they should be empowered to borrow a sum not exceeding 1,200,000*l.* He at the same time observed, that in all probability the company in 1791 would have upwards of 3,000,000*l.* sterling more than sufficient to discharge their debts. The measure was carried through both houses without opposition.

3. *Hudson's Bay Company.* The vast countries which surround Hudson's Bay abound with animals whose furs and skins are excellent, being far superior in quality to those found in less northerly regions. In 1670, a charter was granted to a company, which does not consist of above nine or ten persons, for the exclusive trade to this bay; and they have acted under it ever since with great benefit to themselves. The company employ four ships and 130 seamen. They have several forts, viz. Prince of Wales's fort, Churchill river, Nelson, New Severn, and Albany, which stand on the west side of the bay, and are garrisoned by 186 men. The French, in May 1782, took and destroyed these forts, and the settlements, &c. valued at 500,000*l.* They export commodities to the value of 16,000*l.* and bring home returns to the value of 29,340*l.* which yield to the revenue 3734*l.* This includes the fishery in Hudson's Bay. This commerce, small as it is, affords immense profits to the company, and even some advantages to Great Britain in general; for the commodities we exchange with the Indians for their skins and furs, are all manufactured in Britain; and as the Indians are not very nice in their choice, such things are sent of which we have the greatest plenty, and which, in the mercantile phrase, are drugs with us. Though the workmanship too happens to be in many respects so deficient that no civilized people would take it off our hands, it may be admired among the Indians. On the other hand, the skins and furs

we bring from Hudson's Bay, enter largely into our Company. manufactures, and afford us materials for trading with many nations of Europe to great advantage. These circumstances tend to prove incontestably the immense benefit that would redound to Great Britain, by throwing open the trade to Hudson's Bay, since even in its present restrained state it is so advantageous. This company, it is probable, do not find their trade so advantageous now as it was before we got possession of Canada. The only attempt made to trade with Labrador has been directed towards the fishery, the annual produce of which exceeds 49,000*l.*

THE above are the principal trading companies presently subsisting in Great Britain; but to the number might have been added one of vast importance, the *Scotch Darien Company*, had it not been for the crooked and pusillanimous policy of the English ministry at the time. For an account of which, see the article **DA-RIEN.**

Greenland COMPANY. See **GREENLAND.**

Banking COMPANIES. See **BANK.**

Of establishments similar to the above in other countries, the following belonging to the Dutch and French, may be mentioned as the most important.

I. **DUTCH Companies.** 1. Their East India company had its rise in the midst of the struggle which that people had for their liberty: for the Spaniards having forbidden all commerce with them, and shut up all their ports, necessity inspired some Zealanders to seek a north-east passage to China.

This enterprise proving unsuccessful to three several armaments in 1594, 1595, and 1596, a second company was formed, under the name of the *Company of remote Parts*; which, in 1597, took the ordinary route of the Portuguese to the Indies, and returned in two years and a half's time with little gain but good hopes.

This company, and a new one just established at Amsterdam, being united, equipped other fleets; and these occasioned other companies at Amsterdam, Rotterdam, in Zealand, &c. inasmuch that the states soon began to apprehend they might be prejudicial to each other. Under this concern, they called all the directors of the several companies together, who all consented to an union, the treaty whereof was confirmed by the states in 1602; a very remarkable epocha, as being that of the most solid and celebrated establishment of commerce that ever was in the world.

Its first capital was six million six hundred thousand guilders. It had sixty directors, divided into several chambers; twenty in that of Amsterdam, twelve in that of Zealand, fourteen in that of Delft and Rotterdam, and a like number in those at Sluys and Horn. As each grant expires, the company is obliged to procure a new one, which it has already done five times since the first, paying a considerable sum each time. The last application was in 1773, when the company, after stating that its trade had declined, solicited the states-general to grant a diminution of the sum formerly paid for the renewal of the charter. Upon this representation, their high mightinesses, in order to have time to inquire into the matter, prolonged the charter

Company charter for three years, upon the old establishment; and finding, upon examination, that the company had really sustained great losses, and its trade considerably declined, they acted with the spirit of a wise commercial commonwealth, by complying with the company's request. They therefore, in 1776, granted them a new charter for 30 years, on the same terms as the former, on the immediate payment of 2,000,000 of florins, instead of 3,000,000 which they paid before, and the sum of 360,000 florins yearly; which annual payment they were allowed to make either in money or merchandise. In consequence of this indulgence, the stock of the company rose in a short time no less than 19 per cent.

Their factories, residences, &c. in the East Indies, are very numerous; reaching from the Persian gulf to the coast of China: the principal is that of Batavia, the centre of their commerce; here resides their general, with the state and splendor of a sovereign prince; making war and peace with the eastern kings and emperors at pleasure.

The other more considerable factories are, Taiouam on the coast of China, Nangisac in Japan, Malacca, Surat, Amboyna, Banda, Siam, Moluccas, &c. several on the coast of Coromandel, and at Ispahan, Cape of Good Hope, &c.: in all, they number 40 factories and 25 fortresses. They have the whole trade of the spicery in their own hands.

2. Their *West India Company* was established in 1621, with an exclusive privilege to trade 24 years along the coasts of Africa, between the tropic of Cancer and the Cape of Good Hope; and in America from the south point of Newfoundland, through the straits of Magellan, that of Le Maire, or others, to the straits of Anian, both in the North and South sea. The directors are divided into five chambers (as in the East India company), out of which 19 are chosen for the general direction of affairs. In 1647, the company renewed its grant for 25 years; but it was scarce able to hold out the term, on account of its great losses and expences in taking the bay of Todos los Santos, Fernambuc, and the greatest part of Brasil, from the Portuguese. The weakness of this company, which had several times in vain attempted to be joined to that of the East Indies, occasioned its dissolution at the expiration of its grant.

In 1674, a new company, composed of the ancient proprietors and their creditors, was settled in the same rights and establishment with the former; and still subsists, though considerably decayed. Their first capital was about six millions of florins. Its principal establishments are, one at Cape Verd, another on the Gold Coast of Africa, at Tobago, Curassao, &c. in America.

II. FRENCH Companies. 1. Their *East India Company* was established in 1664, with an exclusive privilege to trade for 50 years in all the seas of the East Indies and South Sea. No adventurer to be admitted without 1000 livres in stock; and foreigners who have 20,000 livres in stock to be reputed regnicoles.

The patent grants them the island of Madagascar; and the king to be at one-fifth of the expence of the three first armaments, without interest; the principal to be refunded in ten years; or, if the company find

it loses on the whole, the loss to fall on the king's Company side.

The capital fund of the company, which was mostly furnished by the king, was seven or eight millions of livres, but was to have been fifteen millions.

In effect, though no means were wanting to support the company, yet it still drooped and still struggled; till having subsisted ten years without any change in its form, and being no longer able to discharge its engagements, there were new regulations concerted, but to little purpose. At length, things not being disposed for a new East India Company, nor much good to be expected from the old one, in 1708 the minister allowed the directors to treat with the rich traders of St Malo, and resign to them their privilege under certain conditions. In the hands of these last, the company began to flourish. See *India Company*, below.

Its chief factory is at Pondicherry, on the coast of Coromandel. This is the residence of the director-general. The other factories are inconsiderable. The merchandises which the company brings into France are, silks, cottons, spices, coffee, rice, saltpetre; several kinds of gums and drugs, woods, wax, printed calicoes, mullins, &c.

2. Their *West India Company* was established in 1664. Their charter gave them the property and feignory of Canada, Acadia, the Antilles islands, isle of Cayenne, and the Terra Firma of America, from the river of the Amazons to that of Oroonoko; with an exclusive privilege for the commerce of those places, as also of Senegal and the coasts of Guinea, for 40 years, only paying half the duties. The stock of the company was so considerable, that in less than six months 45 vessels were equipped; with which they took possession of all the places in their grant, and settled a commerce: yet this only subsisted nine years. In 1674, the grant was revoked, and the countries above-reunited to the king's dominions as before: the king reimbursing the actions of the adventurers. This revocation was owing partly to the poverty of the company, occasioned by its losses in the wars with England, which had necessitated it to borrow above a million, and even to alienate its exclusive privilege for the coasts of Guinea: and partly to its having in good measure answered its end: which was to recover the commerce of the West Indies from the Dutch, who had torn it from them: for the French merchants, being now accustomed to traffic to the Antilles, by permission of the company, were so attached to it, that it was not doubted they would support the commerce after the dissolution of the company.

3. Their *Mississippi Company* was first established in 1684 in favour of the Chevalier de la Salle; who having projected it in 1660, and being appointed governor of the fort of Frontignac at the mouth of that river, travelled over the country in the year 1683, and returned to France to solicit the establishment. This obtained, he set sail for his new colony with four vessels laden with inhabitants, &c. but entering the gulf of Mexico, he did not, it seems, know the river that had cost him so much fatigue, but settled on another river unknown, where his colony perished by degrees; so that in 1685 there were not 100 persons remaining. Making several expeditions to find the Mis-

issippi,

Company. Mississippi, he was killed in one of them by a party who mutinied against him; whereupon the colony was dispersed and lost. M. Hiberville afterwards succeeded better. He found the Mississippi, built a fort, and settled a French colony there; but he being poisoned, it is said, by the intrigues of the Spaniards, who feared such a neighbour, in 1712 M. Crozat had the whole property of trading to the French territories called *Louisiana* granted him for 15 years.

4. *Company of the West.* In 1717, the Sieur Crozat surrendered his grant; and in the same year a new company was erected under the title of *Company of the West*: to which, besides every thing granted to the former company, was added the commerce of beaver, enjoyed by the Canada company from the year 1706, but expiring in 1717. In this establishment, an equal view was had to the finances and the commerce of the nation; and, accordingly, part of the conditions of its establishment regarded the settling a colony, a trade, &c. the other the vending part of the bills, called *bills of state*, which could no longer subsist on their present footing. The former are no more than are usual in such establishments: for the latter, the actions are fixed at 500 livres, each payable in bills of state; the actions to be esteemed as merchandise, and in that quality to be bought, sold, and trafficked. The bills of state, which make the fund of the actions, to be converted into yearly revenue. To put the finishing hand to the company, in 1717 its fund was fixed at an hundred millions of livres; which being filled, the cash was shut up.

5. *India Company.* The junction of the former company with that of Canada was immediately followed by its union with that of Senegal, both in the year 1718, by an arret of council: which at the same time granted the new company the commerce of beavers, and made it mistress of the negro or Guinea trade to the French colonies in America.

Nothing was now wanting to its perfection but an union with the East India company, and with those of China and St Domingo; which was effected, with the two first in 1719, and with the third in 1720. This union of the East India and China company with the company of the West, occasioned an alteration of the name; and it was henceforth called the *India Company*.

The reasons of the union were, the inability of the two former to carry on their commerce; the immense debts they had contracted in the Indies, especially the East Company, complaints whereof had been sent to court by the Indians, which discredited the company so that they durst not appear any longer at Surat; the little care they took to discharge their engagements; and their having transferred their privilege to the private traders of St Malo, in consideration of a tenth in the profits of the returns of their ships.

The ancient actions of the company of the West, which were not at par when this engraftment was projected, before it was completed, were risen to 300 per cent.; which unexpected success gave occasion to conclude the new actions of the united companies would not bear less credit. The concourse of subscribers was so great, that in a month's time there were above fifty millions subscribed for: the first twenty-five million

actions which were granted to the India company, beyond the hundred millions of stock allowed the company of the West, being filled as soon as the books were opened; to satisfy the earnestness of the subscribers, the stock was increased by several arrears to three hundred millions. Credit still increasing, the new actions rose to 1200 per cent. and those of the ancient company of the West to 1900 per cent.; an exorbitant price, to which no other company ever rose. Its condition was now so flourishing, that in 1719 it offered the king to take a lease of all his farms for nine years, at the rate of three millions five hundred thousand livres per annum more than had been given before; and also to lend his majesty twelve hundred millions of livres to pay the debts of the state. These offers were accepted; and the king, in consideration hereof, granted them all the privileges of the several grants of the companies united to that company to the year 1770; on condition, however, of discharging all the debts of the Old East India Company, without any deduction at all. The loan of twelve hundred millions not being sufficient for the occasion of the state, was augmented, three months afterwards, with three hundred millions more; which, with the former loan, and another of one hundred millions before, made sixteen hundred millions, for which the king was to pay interest at the rate of three per cent.

The duke of Orleans, in February 1720, did the company the honour to preside in their assembly, where he made several proposals to them on the part of the king: the principal of these was, that they should take on them the charge and administration of the royal bank. This was accepted of: and Mr Law, comptroller-general of the finances, was named by the king inspector-general of the India Company and bank united.

This union, which, it was proposed, should have been a mutual help to both those famous establishments, proved the fatal point from whence the fall of both commenced: from this time, both the bank bills and the actions of the company began to fall. In effect, the first perished absolutely, and the other had been drawn along with it but for the prudent precautions taken for its support.

The first precaution was the revoking the office of inspector-general, and the obliging Mr Law to quit the kingdom; the ancient directors were discarded, and new ones substituted; and, to find the bottom of the company's affairs, it was ordered they should give an account of what they had received and disbursed, both on the account of the company and of the bank, which they had had the management of near a year. Another precaution to come at the state of the company was, by endeavouring to distinguish the lawful actionaries from the Mississippi extortioners; whose immense riches, as well as their criminal address in realizing their actions either into specie or merchandise, were become so fatal to the state; in order, if possible, to secure the honest adventurers in their stock. To this end, an inquisition was made into their books, &c. by persons appointed by the king; and the new directors, or, as they were called, *regisseurs*, began seriously to look about for their commerce abroad. Their affairs, however, declined, and at length sunk into a ruined and bankrupt state about the year 1769. The king

Company. king immediately suspended their exclusive privileges, and laid the trade to the East open to all his subjects; consigning, at the same time, the affairs of the company to the care of the ministry to adjust and settle. But the various schemes which were then formed for the restoration of the old company, and the establishment of a new one, were accompanied with such insurmountable difficulties, as to prove wholly ineffectual. Nor was the laying open of the trade attended immediately with the success that was expected; the merchants being very slow in engaging in it, though the king, by way of encouragement, lent them some of his own ships to convey their commodities to the East; and the garrison and civil establishments continued to be supported in their existing form by the crown. The measure, however, proved in time successful; so that for a course of years previous to 1785, the annual importation from India was considerably greater than during any former period. But whether it was that they regarded this prosperity as precarious; or aimed at a more extensive success; or that they wished, in imitation of Britain, for territorial acquisitions in that climate, and believed an incorporated society the best instrument of obtaining them; the French court was induced to listen to proposals for establishing a new East India Company. Their privilege was for seven years, with the special proviso, that years of war which might occur in the interim should be excluded from the computation.

In the preamble of the act of the 14th April 1785, by which the scheme was adopted, it was alledged, "that the commodities of Europe not having of late years been regulated by any common standard, or proportioned to the demands of India, had on the one hand sold at a low price; while, on the other, the competition of the subjects of France had raised the price of the objects of importation: that, upon their return home, a want of system and assortment had been universally complained of, the market being overstocked with one species of goods, and totally destitute of another; that these defects must necessarily continue as long as the trade remained in private hands; and that, on their account, as well as that of the capital required, the establishment of a new company was absolutely necessary."

These reasonings did not appear altogether satisfactory to the persons principally interested. France has been so far enlightened by the discussions of the excellent writers she has produced upon questions of politics and commerce, as not to be prepared to behold the introduction of monopolies with a very favourable eye. By many persons it was remarked, that the arguments of the preamble did not apply more to the trade of India than to any other trade; and that, if they were admitted in their entire force, they were calculated to give a finishing blow to the freedom of commerce. The capital of the new company, which amounted to 830,000*l.* was ridiculed as altogether inadequate to the magnitude of the undertaking. The privileges with which it was indulged were treated as enormous. The monopoly of East India goods imported into France from any part of Europe, was granted to them for two years, as well as the monopoly of East India goods imported from the place of their growth. It was said, that during that period

they would fit out no adventures for India; that they hoped to obtain a prolongation of this injurious indulgence; and that, of consequence, their incorporation was in reality a conspiracy to prevent all future communication between France and the sources of commerce in Asia. A provision in the act, directing that the prices of East India goods in the islands of Mauritius and Bourbon should be regulated by a tariff to be fixed by the court of Versailles, excited still louder exclamations. In this instance, it was said, the first principles of commerce were trampled upon in a manner the most wanton and absurd. Instead of suffering it to find its own level by the mutual collision of the wants of one party and the labour of another, it was arbitrarily to be fashioned by a power whose extreme distance must necessarily render its decisions ill-timed and inapplicable. The very mode in which the monopoly was introduced was a subject of complaint. It was determined by a resolution of the king in council; a proceeding totally inadequate to the importance of the subject, and which was to be regarded as clandestine and surreptitious. In all former instances such measures assumed the form of edicts, and were registered in the parliaments. It was the prerogative of these courts to verify them; that is, to inquire into the facts which had led to their adoption. The injured parties had an opportunity of being heard before the privilege assumed the form of a law; not privately by the ministers of the sovereign, but publicly by the most considerable bodies in the kingdom, and in the face of the nation.

The act of council establishing a new East India Company, was followed on the tenth of June by another declaration, intended still farther to promote their interest; by which it was expressly forbidden to import cottons, printed linens, and mullins, except through the medium of the company. The act proceeds upon the same principles of monopoly as in the former instance. It sets out indeed with a declaration, "that nothing can appear more desirable to the king, or better accord with the sentiments of his heart, than a general liberty, that freeing at once the circulation of commodities from every species of restraint, should seem to make of all the people of the world but one nation with respect to commerce." But it adds, "that the period of this liberty is not yet arrived: that it must either be, with respect to the nations of Europe, unlimited and reciprocal, or that it cannot be admitted: that the revocation of the former indulgence respecting cottons and linens was become necessary on account of the opportunities it created for contraband trade; and because the competition of the East India Company and private traders would occasion a surplus in the market, and the admission of foreign manufactures would decrease and annihilate the national industry."

The provisions that were made for carrying this law into effect were considered as unjust and severe. The merchants possessing any of the prohibited commodities were allowed twelve months to dispose of them; but upon the express condition, that the commodities were to bear a stamp, importing that they were vendible only to a certain period; a circumstance that must necessarily depreciate their value. It was also enacted, that the house of any trader might be entered by day

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||
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or by night, at the solicitation of the directors, to search for prohibited goods, which were to be confiscated to the use of the company. These kinds of visits of the officers of revenue, hitherto unauthorized in France, were represented as peculiarly obnoxious, when they were made for the sole benefit of a privileged monopoly.

COMPANY, in military affairs, a small body of foot, commanded by a captain, who has under him a lieutenant and ensign.

The number of sentinels or private soldiers in a company is from 50 to 100; and a battalion or regiment consists of 9, 10, or 11, such companies, one of which is always grenadiers, and posted on the right; next them stands the colonel's company, and on the left the light infantry company. Companies not incorporated into regiments are called *irregulars*, or *independent companies*.

Artillery COMPANY. See ARTILLERY.

COMPANY of Ships, a fleet of merchantmen, who make a charter-party among themselves; the principal conditions whereof usually are, that certain vessels shall be acknowledged admiral, vice-admiral, and rear-admiral; that such and such signals shall be observed; that those which bear no guns shall pay so much per cent. of their cargo; and in case they be attacked, that what damages are sustained shall be reimbursed by the company in general. In the Mediterranean, such companies are called *conservees*.

COMPARATIVE ANATOMY, is that branch of anatomy which considers the secondary objects, or the bodies of other animals; serving for the more accurate distinctions of several parts, and supplying the defect of human subjects.

It is otherwise called *the anatomy of beasts*, and sometimes *zootomy*; and stands in contradistinction to human anatomy, or that branch of the art which considers the human body the primary object of anatomy. See ANATOMY.

COMPARATIVE Degree, among grammarians, that between the positive and superlative degrees, expressive of any particular quality above or below the level of another.

COMPARISON, in a general sense, the consideration of the relation between two persons or things, when opposed to each other, by which we judge of their agreement or difference.

COMPARISON of Ideas, an act of the mind, whereby it compares its ideas one with another, in respect of extent, degree, time, place, or any other circumstances. See IDEA.

Brutes seem not to have this faculty in any great degree: they have, probably, several ideas distinct enough; but cannot compare them farther than as to some sensible circumstances annexed to the objects themselves; the power of comparing general ideas, which we observe in men, we may probably conjecture they have not at all.

COMPARISON, in *Grammar*, the inflection of the comparative degree. See GRAMMAR.

COMPARISON, in *Rhetoric*, is a figure whereby two things are considered with regard to some third, which is common to them both.

Infruction is the principal, but not the only end of comparison. It may be employed with success in putting a subject in a strong point of view. A lively idea is formed of a man's courage by likening it to that of a lion; and eloquence is exalted in our imagination comparing it to a river overflowing its banks, and involving all in its impetuous course. The same effect is produced by contrast: a man in prosperity becomes more sensible of his happiness, by comparing his condition with that of a person in want of bread. Thus comparison is subservient to poetry as well as to philosophy.

Comparisons serve two purposes: when addressed to the understanding, their purpose is to instruct; when to the heart, their purpose is to please. Various means contribute to the latter: 1st, The suggesting some unusual resemblance or contrast*; 2d, The setting an object in the strongest light; 3d, The associating an object with others that are agreeable; 4th, The elevating an object; and, 5th, The depressing it. And that comparisons may give pleasure by these various means, will be made evident by examples which shall be given, after premising some general observations.

Objects of different senses cannot be compared together; for such objects are totally separated from each other, and have no circumstance in common to admit either resemblance or contrast. Objects of hearing may be compared together, as also of taste, of smell, and of touch; but the chief fund of comparison are objects of sight; because in writing or speaking, things can only be compared in idea, and the ideas of sight are more distinct and lively than those of any other sense.

When a nation emerging out of barbarity begins to think of the fine arts, the beauties of language cannot long lie concealed; and when discovered, they are generally, by the force of novelty, carried beyond all bounds of moderation. Thus, in the earliest poems of every nation, we find metaphors and similes founded on the slightest and most distant resemblances, which, losing their grace with their novelty, wear gradually out of repute; and now, by the improvement of taste, no metaphor nor simile is admitted into any polite composition but of the most striking kind. To illustrate this observation, a specimen shall be given afterward of such metaphors as we have been describing: with respect to similes take the following specimen:

“Behold, thou art fair, my love: thy hair is as
“a flock of goats that appear from Mount Gilead:
“thy teeth are like a flock of sheep from the wash-
“ing, every one bearing twins: thy lips are like
“a thread of scarlet: thy neck like the tower of
“David built for an armoury, whereon hang a
“thousand shields of mighty men: thy two breasts
“like two young roes that are twins, which feed
“among the lilies: thy eyes like the fish-pools in
“Hesbon, by the gate of Bath-rabbim: thy nose
“like the tower of Lebanon, looking toward Da-
“mascus.” *Song of Solomon.*

“Thou art like snow on the heath; thy hair like
“the mist of Cromla, when it curls on the rocks
“and shines to the beam of the west: thy breasts
“are

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son.

* See the
article
RESEM-
BLANCE
and *Dissemi-
tude.*

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fon.

“ are like two smooth rocks seen from Branno of
“ the streams: thy arms like two white pillars in
“ the hall of the mighty Fingal.” *Fingal.*

It has no good effect to compare things by way of simile that are of the same kind; nor to contrast things of different kinds. The reason is given in the article above cited on the margin, and shall be here illustrated by examples. The first is a comparison built upon a resemblance so obvious as to make little or no impression. Speaking of the fallen angels searching for mines of gold:

A numerous brigade hasten'd: as when bands
Of pioneers with spade and pickaxe arm'd,
Forerun the royal camp to trench a field
Or cast a rampart. *Milton.*

The next is of things contrasted that are of different kinds.

Queen. What, is my Richard both in shape and
mind
Transform'd and weak? Hath Bolingbroke depos'd
Thine intellect? Hath he been in thy heart?
The lion, dying, thrusteth forth his paw,
And wounds the earth, if nothing else, with rage
To be o'erpower'd: and wilt thou, pupil like,
Take thy correction mildly, kiss the rod,
And fawn on rage with base humility?

Richard II. Act v. sc. 1.

This comparison has scarce any force: a man and a lion are of different species, and therefore are proper subjects for a simile; but there is no such resemblance between them in general, as to produce any strong effect by contrasting particular attributes or circumstances.

A third general observation is, That abstract terms can never be the subject of comparison, otherwise than by being personified. Shakespeare compares adversity to a toad, and slander to the bite of a crocodile; but in such comparisons these abstract terms must be imagined sensible beings.

To have a just notion of comparisons, they must be distinguished into two kinds; one common and familiar, as where a man is compared to a lion in courage, or to a horse in speed; the other more distant and refined, where two things that have in themselves no resemblance or opposition, are compared with respect to their effects. There is no resemblance between a flower-pot and a cheerful song; and yet they may be compared with respect to their effects, the emotions they produce in the mind being extremely similar. There is as little resemblance between fraternal concord and precious ointment; and yet observe how successfully they are compared with respect to the impressions they make.

“ Behold, how good and how pleasant it is for
“ brethren to dwell together in unity. It is like
“ the precious ointment upon the head, that ran
“ down upon Aaron's beard, and descended to the
“ skirts of his garment.” *Psalms 133.*

For illustrating this sort of comparison, we shall add some more examples:

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“ Delightful is thy presence, O Fingal! it is like
“ the sun on Cromla, when the hunter mourns his
“ absence for a season, and sees him between the
“ clouds.

“ Did not Ossian hear a voice? or is it the sound
“ of days that are no more? Often, like the evening
“ sun, comes the memory of former times on my
“ soul.

“ His countenance is settled from war; and is
“ calm as the evening-beam, that from the cloud of
“ the west looks on Cona's silent vale.” *Fingal.*

We now proceed to illustrate, by particular instances, the different means by which comparisons, whether of the one sort or the other, can afford pleasure; and, in the order above established, we shall begin with such instances as are agreeable, by suggesting some unusual resemblance or contrast.

Sweet are the uses of Adversity,
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in her head.
As you like it, Act ii. sc. 1.

See, how the morning opes her golden gates,
And takes her farewell of the glorious sun;
How well resembles it the prime of youth,
Trim'd like a yonker prancing to his love.
Second Part Henry VI. Act ii. sc. 1.

Thus they their doubtful consultations dark
Ended, rejoicing in their matchless chief:
As when from mountain tops, the dusky clouds
Ascending, while the North-wind sleeps, o'erspread
Heav'n's cheerful face, the lowering element
Scowls o'er the darken'd landscape, snow, and
shower;

If chance the radiant sun with farewell sweet
Extends his evening-beam, the fields revive,
The birds their notes renew, and bleating herds
Attest their joy, that hill and valley rings.
Paradise Lost, Book ii.

None of the foregoing similes tend to illustrate the principal subject, and therefore the chief pleasure they afford must arise from suggesting resemblances that are not obvious; for undoubtedly a beautiful subject introduced to form the simile affords a separate pleasure, which is felt in the similes mentioned, particularly in that cited from Milton.

The next effect of a comparison in the order mentioned, is to place an object in a strong point of view; which effect is remarkable in the following similes.

As when two scales are charg'd with doubtful loads,
From side to side the trembling balance nods,
(While some laborious matron, just and poor,
With nice exactness weighs her woolly store),
Till pois'd aloft, the resting beam suspends
Each equal weight; nor this nor that descends;
So stood the war, till Hector's matchless might,
With fates prevailing, turn'd the scale of fight.
Fierce as a whirlwind up the wall he flies,
And fires his host with loud repeated cries.
Iliad, Book xii. 521.

————— She never told her love;
But let concealment, like a worm i' th' bud,
Z z Feed

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son.

Feed on her damask cheek : she pin'd in thought ;
And with a green and yellow melancholy,
She sat like Patience on a monument,
Smiling at grief. *Twelfth Night*, Act ii. sc. 6.

“ There is a joy in grief when peace dwells with
“ the sorrowful. But they are waded with mourn-
“ ing, O daughter of Toscar, and their days are
“ few. They fall away like the flower on which
“ the sun looks in his strength, after the mildew
“ has passed over it, and its head is heavy with the
“ drops of night.” *Fingal*.

————— Out, out, brief candle !
Life's but a walking shadow, a poor player,
That struts and frets his hour upon the stage,
And then is heard no more. *Macbeth*, Act v. sc. 5.

O thou goddess,
Thou divine nature ! how thyself thou blazon'st
In these two princely boys ! they are as gentle
As zephyrs blowing below the violet,
Not wagging his sweet head ; and yet as rough
(Their royal blood in-chaf'd) as the rudest wind,
That by the top doth take the mountain-pine,
And make him stoop to the vale. *Cymbeline*, Act iv. sc. 4.

“ Why did not I pass away in secret, like the
“ flower of the rock that lifts its fair head unseen,
“ and strows its withered leaves on the blast ?”
Fingal.

As words convey but a faint and obscure notion of
great numbers, a poet, to give a lively notion of the
object he describes with regard to number, does well
to compare it to what is familiar and commonly known.
Thus Homer compares the Grecian army in point of
number to a swarm of bees ; in another passage he
compares it to that profusion of leaves and flowers
which appear in the spring, or of insects in a summer's
evening : And Milton,

————— As when the potent rod
Of Amram's son in Egypt's evil day
Wav'd round the coast, up call'd a pitchy cloud
Of locusts, warping on the eastern wind,
That o'er the realm of impious Pharaoh hung
Like night, and darken'd all the land of Nile ;
So numberless were those bad angels seen,
Hov'ring on wing under the cope of hell,
'Twi'x upper, nether, and surrounding fires.
Paradise Lost, Book i.

Such comparisons have, by some writers, been con-
demned for the lowness of the images introduced, but
surely without reason ; for, with regard to numbers,
they put the principal subject in a strong light.

The foregoing comparisons operate by resemblance ;
others have the same effect by contrast.

York. I am the last of noble Edward's sons,
Of whom thy father, prince of Wales, was first ;
In war, was never lion rag'd more fierce ;
In peace, was never gentle lamb more mild,
Than was that young and princely gentleman.
His face thou hast, for even so look'd he,
Accomplish'd with the number of thy hours,

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son.

But when he frown'd, it was against the French,
And not against his friends. His noble hand
Did win what he did spend ; and spent not that
Which his triumphant father's hand had won.
His hands were guilty of no kindred's blood,
But bloody with the enemies of his kin.
Oh Richard, York is too far gone with grief,
Or else he never would compare between.

Richard, II. Act ii. sc. 3.

Milton has a peculiar talent in embellishing the prin-
cipal subject, by associating it with others that are
agreeable ; which is the third end of a comparison.
Similes of this kind have, beside, a separate effect :
they diversify the narration by new images that are
not strictly necessary to the comparison ; they are
short episodes, which, without drawing us from the
principal subject, afford great delight by their beauty
and variety.

He scarce had ceas'd, when the superior fiend
Was moving toward the shore ; his pond'rous shield,
Ethereal temper, massy, large, and round,
Behind him cast : the broad circumference
Hung on his shoulders like the moon, whose orb
Through optic glass the Tuscan artist views
At evening from the top of Fesole.
Or in Valdarno, to descry new lands,
Rivers, or mountains, in her spotty globe.
Milton, Book i.

————— Thus far these beyond
Compare of mortal prowess, yet observ'd
Their dread commander. He, above the rest,
In shape and stature proudly eminent,
Stood like a tow'r ; his form had not yet lost
All her original brightness, nor appear'd
Less than archangel ruin'd, and th' excess
Of glory obscur'd : as when the sun new-risen
Looks through the horizontal misty air
Shorn of his beams ; or, from behind the moon,
In dim eclipse, disastrous twilight sheds
On half the nations, and with fear of change
Perplexes monarchs. *Milton*, Book i.

As when a vulture on Imaus bred,
Whose snowy ridge the roving Tartar bounds,
Dislodging from a region scarce of prey
To gorge the flesh of lambs, or yearling kids,
On hills where flocks are fed, flies toward the springs
Of Ganges or Hydaspes, Indian streams,
But in his way lights on the barren plains,
Of Sericana, where Chineses drive
With sails and wind their cany waggons light :
So on this windy sea of land, the fiend
Walk'd up and down alone, bent on his prey.
Milton, Book iii.

Next of comparisons that aggrandise or elevate.
These affect us more than any other sort ; the reason
of which will be evident from the following in-
stances :

As when a flame the winding valley fills,
And runs on crackling shrubs between the hills,
Then o'er the stubble up the mountain flies,
Fires the high woods, and blazes to the skies,

This

Compari-
son.

This way and that, the spreading torrent roars ;
So sweeps the hero through the wasted shores.
Around him wide, immense destruction pours,
And earth is delug'd with the sanguine show'rs.

Iliad, xx. 569.

Methinks, King Richard and myself should meet
With no less terror than the elements
Of fire and water, when their thund'ring shock,
At meeting, tears the cloudy cheeks of heav'n.

Richard II. Act iii. sc. 5.

“ As rusheth a foamy stream from the dark shady
“ steep of Cromla, when thunder is rolling above, and
“ dark brown night rests on the hill : so fierce, so
“ vast, so terrible, rush forward the sons of Erin. The
“ chief, like a whale of ocean followed by all its bil-
“ lows, pours valour forth as a stream, rolling its might
“ along the shore.”

Fingal, Book i.

“ As roll a thousand waves to a rock, so Swaran's
“ host came on ; as meets a rock a thousand waves, so
“ Inisfail met Swaran.”

Ibid.

The last article mentioned, is that of lessening or depressing a hated or disagreeable object ; which is effectually done by resembling it to any thing low or despicable.

Thus Milton, in his description of the rout of the rebel-angels, happily expresses their terror and dismay in the following simile :

—————As a herd
Of goats or timorous flock together throng'd,
Drove them before him thunder-struck, pursu'd
With terrors and with furies to the bounds
And crystal wall of heav'n, which op'ning wide,
Roll'd inward, and a spacious gap disclos'd
Into the wasteful deep ; the monstrous fight
Struck them with horror backward, but far worse
Urg'd them behind ; headlong themselves they threw
Down from the verge of heav'n.

Milton, Book vi.

By this time the different purposes of comparison, and the various impressions it makes on the mind, are sufficiently illustrated by proper examples. This was an easy work. It is more difficult to lay down rules about the propriety or impropriety of comparisons ; in what circumstances they may be introduced, and in what circumstances they are out of place. It is evident, that a comparison is not proper upon every occasion ; a man in his cool and sedate moments is not disposed to poetical flights, nor to sacrifice truth and reality to the delusive operations of the imagination ; far less is he so disposed, when oppressed with care, or interested in some important transaction that occupies him totally. On the other hand, it is observed, that a man, when elevated or animated by any passion, is disposed to elevate or animate all his subjects ; he avoids familiar names, exalts objects by circumlocution and metaphor, and gives even life and voluntary action to inanimate beings. In this warmth of mind, the highest poetical flights are indulged, and the boldest similes and metaphors relished. But without soaring so high, the mind is frequently in a tone to relish chaste and moderate ornament ; such as comparisons that set the principal object in a strong point of view, or that embellish and diversify the narration.

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son.

In general, when by any animating passion, whether pleasant or painful, an impulse is given to the imagination ; we are in that condition disposed to every sort of figurative expression, and in particular to comparisons. This in a great measure is evident from the comparisons already mentioned ; and shall be further illustrated by other instances. Love, for example, in its infancy, rousing the imagination, prompts the heart to display itself in figurative language, and in similes :

Troilus. Tell me, Apollo, for thy Daphne's love,
What Cressid is, what Pandar, and what we ?
Her bed is India, there she lies a pearl ;
Between our Ilium, and where she resides,
Let it be call'd the wild and wandering flood ;
Ourself the merchant, and this sailing Pandar
Our doubtful hope, our convoy, and our bark.

Troilus and Cressida, Act i. sc. 1.

Again :

Come, gentle night ; come, loving black-brow'd
night !
Give me my Romeo : and, when he shall die,
Take him and cut him out in little stars,
And he will make the face of heav'n so fine,
That all the world shall be in love with night,
And pay no worship to the garish sun.

Romeo and Juliet, Act. iii. sc. 4.

But it will be a better illustration of the present head, to give examples where comparisons are improperly introduced. Similes are not the language of a man in his ordinary state of mind, dispatching his daily and usual work : for that reason, the following speech of a gardener to his servant is extremely improper :

Go bind thou up yon dangling apricots,
Which, like unruly children, make their fire
Stoop with oppression of their prodigal weight :
Give some supportances to the bending twigs.
Go thou, and, like an executioner,
Cut off the heads of too fast growing sprays,
That look too lofty in our commonwealth :
All must be even in our government.

Richard II. Act iii. sc. 7.

The fertility of Shakespeare's vein betrays him frequently into this error.

Rooted grief, deep anguish, terror, remorse, despair, and all the severe dispiriting passions, are declared enemies, perhaps not to figurative language in general, but undoubtedly to the pomp and solemnity of comparison. Upon this account, the simile pronounced by young Rutland, under terror of death from an inveterate enemy, and praying mercy, is unnatural ;

So looks the pent-up lion o'er the wretch
That trembles under his devouring paws ;
And so he walks insulting o'er his prey,
And so he comes to rend his limbs asunder.
Ah, gentle Clifford, kill me with thy sword,
And not with such a cruel threat'ning look.

Third Part Henry VI. Act i. sc. 5.

A man spent and dispirited after losing a battle, is not disposed to heighten or illustrate his discourse by similes.

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son.

York. With this we charg'd again : but out ! alas,
We bodg'd again ; as I have seen a swan
With bootless labour swim against the tide,
And spend her strength with over-matching waves.
Ah ! hark, the fatal followers do pursue,
And I am faint and cannot fly their fury.
The sands are number'd that make up my life ;
Here must I stay, and here my life must end.

Third Part Henry VI. Act i. sc. 6.

Similes thus unseasonably introduced are finely ridiculed in the Rehearſal.

“ *Bayes.* Now here she must make a simile.

“ *Smith.* Where's the necessity of that, Mr Bayes ?

“ *Bayes.* Because she's surpris'd ; that's a general rule ; you must ever make a simile when you are surpris'd ; 'tis a new way of writing”

A comparison is not always faultless, even where it is properly introduced. A comparison, like other human productions, may fall short of its end ; of which defect instances are not rare even among good writers : and to complete the present subject, it will be necessary to make some observations upon such faulty comparisons. Nothing can be more erroneous than to institute a comparison too faint : a distant resemblance or contrast fatigues the mind with its obscurity, instead of amusing it ; and tends not to fulfil any one end of a comparison. The following similes seem to labour under this defect.

K. Rich. Give me the crown.—Here, cousin,
seize the crown,
Here on this side, my hand ; on that side, thine.
Now is this golden crown like a deep well,
That owes two buckets, filling one another ;
The emptier ever dancing in the air,
The other down, unseen, and full of water ;
That bucket down, and full of tears, am I,
Drinking my griefs, whilst you mount up on high.

Richard II. Act iv. sc. 3.

K. John. Oh ! cousin, thou art come to set mine
eye ;
The tackle of my heart is crack'd and burnt ;
And all the shrouds wherewith my life should sail,
Are turned to one thread, one little hair :
My heart hath one poor string to stay it by,
Which holds but till thy news be uttered.

King John, Act iv. sc. 10.

York. My uncles both are slain in rescuing me :
And all my followers to the eager foe
Turn back, and fly like ships before the wind,
Or lambs pursu'd by hunger-starved wolves.

Third Part Henry VI. Act i. sc. 6.

The latter of the two similes is good : the former, because of the faintness of the resemblance, produces no good effect, and crowds the narration with an useless image.

In an epic poem, or in any elevated subject, a writer ought to avoid raising a simile upon a low image, which never fails to bring down the principal subject. In general, it is a rule, that a grand object ought never to be resembled to one that is diminutive, however delicate the resemblance may be : for it is the pe-

culiar character of a grand object to fix the attention, and swell the mind ; in which state, it is disagreeable to contract the mind to a minute object, however elegant. The resembling an object to one that is greater, has, on the contrary, a good effect, by raising or swelling the mind ; for one passes with satisfaction from a small to a great object ; but cannot be drawn down, without reluctance, from great to small. Hence the following similes are faulty.

Compari-
son.

Meanwhile the troops beneath Patroclus' care,
Invade the Trojans, and commence the war.
As wasps, provok'd by children in their play,
Pour from their mansions by the broad highway,
In swarms the guiltless traveller engage,
Whet all their stings, and call forth all their rage ;
All rise in arms, and with a general cry
Assert their waxen domes and buzzing progeny :
Thus from the tents the fervent legion swarms,
So loud their clamours, and so keen their arms.

Iliad, xvi. 312.

So burns the vengeful hornet (soul all o'er)
Repuls'd in vain, and thirsty still of gore ;
(Bold son of air and heat) on angry wings
Untam'd, untir'd, he turns, attacks, and stings.
Fir'd with like ardour, fierce Atrides flew,
And sent his soul with every lance he threw.

Iliad, xvii. 642.

An error opposite to the former, is the introducing a resembling image, so elevated or great as to bear no proportion to the principal subject. Their remarkable disparity, being the most striking circumstance, seizes the mind, and never fails to depress the principal subject by contrast, instead of raising it by resemblance : and if the disparity be exceeding great, the simile takes on an air of burlesque ; nothing being more ridiculous than to force an object out of its proper rank in nature, by equalling it with one greatly superior or greatly inferior. This will be evident from the following comparison.

Loud as a bull makes hill and valley ring,
So roar'd the lock when it releas'd the spring.

Odyssey, xxi. 51.

Such a simile upon the simplest of all actions, that of opening a lock, is pure burlesque.

A writer of delicacy will avoid drawing his comparisons from any image that is nauseous, ugly, or remarkably disagreeable ; for however strong the resemblance may be, more will be lost than gained by such comparison. Therefore we cannot help condemning, though with some reluctance, the following simile, or rather metaphor.

O thou fond many ! with what loud applause
Didst thou beat heav'n with blessing Bolingbroke
Before he was what thou would'st have him be ?
And now being trimm'd up in thine own desires,
Thou, beastly feeder, art so full of him,
That thou provok'st thyself to cast him up.
And so, thou common dog, didst thou disgorge
Thy glutton bosom of the royal Richard,
And now thou would'st eat thy dead vomit up,
And howl'st to find it.

Second Part Henry IV. Act i. sc. 6.
The

Compari-
son.

The strongest objection that can lie against a comparison is, that it consists in words only, not in sense. Such false coin, or bastard-wit, does extremely well in burlesque; but it is far below the dignity of the epic, or of any serious composition.

The noble sister of Poplicola,
The moon of Rome; chaste as the icicle
That's curdl'd by the frost from purest snow,
And hangs on Dian's temple.

Coriolanus, Act v. sc. 3.

There is evidently no resemblance between an icicle and a woman, chaste or unchaste: but chastity is cold in a metaphorical sense, and an icicle is cold in a proper sense; and this verbal resemblance, in the hurry and glow of composing, has been thought a sufficient foundation for the simile. Such phantom similes are mere witticisms, which ought to have no quarter, except where purposely introduced to provoke laughter. Lucian, in his dissertation upon history, talking of a certain author, makes the following comparison, which is verbal merely.

"This author's descriptions are so cold, that they surpass the Caspian snow, and all the ice of the north."

———But for their spirits and souls
This word *rebellion* had froze them up
As fish are in a pond.

Second Part Henry IV. Act i. sc. 3.

Pope has several similes of the same stamp.

And hence one master passion in the breast,
Like Aaron's serpent, swallows up the rest.

Epist. ii. 131.

And again, talking of this same ruling or master passion;

Nature its mother, habit is its nurse;
Wit, spirit, faculties, but make it worse;
Reason itself but gives it edge and pow'r;
As heav'n's blest beam turns vinegar more sour.

Ibid. 145.

Where the subject is burlesque or ludicrous, such similes are far from being improper. Horace says pleasantly,

Quanquam tu levior cortice.

Lib. iii. od. 9.

And Shakelpeare.

In breaking oaths he's stronger than Hercules.

And this leads to observe, that besides the foregoing comparisons, which are all serious, there is a species, the end and purpose of which is to excite gaiety or mirth. Take the following examples.

Falstaff speaking to his page:

"I do here walk before thee, like a sow that hath overwhelmed all her litter but one."

Second Part Henry IV. Act i. sc. 10.

"I think he is not a pick-purse, nor a horse-stealer; but for his verity in love, I do think him as concave as a covered goblet, or a worm-eaten nut."

As you like it, Act iii. sc. 10.

This sword a dagger had his page,
That was but little for his age;
And therefore waited on him so,
As dwarfs upon knight-errants do.

Hudibras, canto 1.

"Books, like men, their authors, have but one way of coming into the world; but there are ten thousand to go out of it, and return no more."

Tale of a Tub.

"The most accomplished way of using books at present is, to serve them as some do lords, learn their titles, and then brag of their acquaintance."

Ibid.

"He does not consider, that sincerity in love is as much out of fashion as sweet snuff; nobody takes it now."

Careless Husband.

COMPARTITION, in *Architecture*, denotes the useful and graceful disposition of the whole ground-plot of an edifice, into rooms of office, and of reception or entertainment.

COMPARTMENT, in general, is a design composed of several different figures, disposed with symmetry, to adorn a parterre, a ceiling, &c.

A compartment of tiles or bricks, is an arrangement of them, of different colours, and varnished, for the decoration of a building. Compartments in gardening, are an assemblage of beds, plots, borders, walks, &c. disposed in the most advantageous manner that the ground will admit of. Compartments in heraldry, are otherwise called *partitions*.

COMPASS, or *Mariner's Steering COMPASS*, is an instrument used at sea by pilots to direct and ascertain the course of their ships. It consists of a circular brass box, which contains a paper card with the 32 points of the compass, fixed on a magnetic needle that always turns to the north, excepting a small declination variable at different places. See *VARIATION*.

The needle with the card turns on an upright pin fixed in the centre of the box. In the centre of the needle is fixed a brass conical socket or cap, whereby the card hanging on the pin turns freely round the centre.

The top of the box is covered with a glass that the card's motion may not be disturbed by the wind. The whole is enclosed in another box of wood, where it is suspended by brass hoops or gimbals, to preserve the card horizontal. The compass-box is to be so placed in the ship, that the middle section of the box, parallel to its sides, may be parallel to the middle section of the ship along its keel.

The compass being of the utmost consequence to navigation, it is reasonable to expect that the greatest attention should be paid to its construction, and every attempt to improve it carefully examined, and, if proper, adopted. But so careless are the generality of commanders of this most useful instrument, that almost all the compasses used on board merchant-ships have their needles formed of two pieces of steel-wire, each of which is bent in the middle, so as to form an obtuse angle; and their ends, being applied together, make an acute one; so that the whole represents the form of a lozenge; in the centre of which, and of the card, is placed the brass cap. Now, if we examine

Compartiti-
on
||
Compass.

Compass. mine a number of these cards, we shall rarely, if ever, find them all in the same direction, but they will all vary more or less, not only with regard to the true direction, but from one another.

These irregularities are owing to the structure of the needle; for the wires of which it is composed are only hardened at the ends; now, if these ends are not equally hard, or if one end be hardened up higher than the other, when they come to be put together, in fixing them to the card, that end which is hardest will destroy much of the virtue of the other; by which means the hardest end will have the most power in directing the card, and consequently make it vary toward its own direction: and, as the wires are disposed in the form of a lozenge, these cards can have but little force, so that they will often, when drawn aside, stand at the distance of several degrees on either side the point from whence they are drawn: for all magnetical bodies receive an additional strength by being placed in the direction of the earth's magnetism, and act proportionably less vigorously when turned out of it; wherefore, when these kind of needles are drawn aside from their true point, two of the parallel sides of the lozenge will conspire, more directly than before, with the earth's magnetism; and the other two will be less in that direction; by which means the two sides will very much impede its return; and the two latter will have that impediment to overcome, as well as the friction, by their own force alone.

To remove these inconveniences, some needles are made of one piece of steel of a spring temper, and broad towards the ends, but tapering towards the middle, where a hole is made to receive the cap. At the ends they terminate in an angle, greater or less according to the skill or fancy of the workman. These needles, though infinitely preferable to the other, are, however, far from being perfect; for every needle of this form hath six poles instead of two, one at each end, two where it becomes tapering, and two at the hole in the middle: this is owing to their shape; for the middle part being very slender, it has not substance enough to conduct the magnetic stream quite through, from one end to the other: all these poles appear very distinctly, when examined with a glass that is sprinkled over with magnetic sand. This circumstance, however, does not hinder the needle from pointing true; but as it has less force to move the card than when the magnetic stream moves in large curves from one end to the other, it is certainly an imperfection.

These inconveniences induced the ingenious Dr Knight to contrive a new sea-compass, which came into use on board all the ships of war. The needle in this instrument is quite straight, and square at the ends; and consequently has only two poles, though about the hole in the middle the curves are a little confused. Needles of this construction, after vibrating a long time, will always point exactly in the same direction; and if drawn ever so little on one side, will return to it again, without any sensible difference. We may therefore conclude, that a regular parallelopiped is the best form for a needle, as well as the simplest, the holes for the caps being as small as possible.

And as the weight should be removed to the greatest distance from the centre of motion, a circle of brass, of the same diameter of the card, may be added, which will serve also to support the card, which may then be made of thin paper, without any thing to stiffen it. This ring being fixed below the card, and the needle above it, the centre of gravity is placed low enough to admit of the cap being put under the needle, whereby the hole in the needle becomes unnecessary.

The above observations will be easily understood from viewing the several parts of the instrument as represented on Plate CL where fig. 6. is the card with the needle KL, and its cap M, fixed upon it, being one-third of the diameter of the real card. Fig. 8. is a perspective view of the backside of the card, where AB represents the turning down of the brass edge, C the under part of the cap, D and E two sliding weights to balance the card, and F, G, two screws that fix the brass edge, &c. to the needle. Fig. 7. is the pedestal that supports the card, containing a screwing needle, fixed in two small grooves to receive it, by means of the collet C, in the manner of a port-crayon. D, the stem, is filed into an octagon, that it may be the more easily unscrewed. For its further illustration and application to use, see NAVIGATION.

The invention of the compass is usually ascribed to Flavio da Melfi, or Flavio Gioia, a Neapolitan, about the year 1302; and hence it is, that the territory of Principato, which makes part of the kingdom of Naples, where he was born, has a compass for its arms. Others say that Marcus Paulus, a Venetian, making a journey to China, brought back the invention with him in 1260. What confirms this conjecture is, that at first they used the compass in the same manner as the Chinese still do; *i. e.* they let it float on a little piece of cork, instead of suspending it on a pivot. It is added, that their emperor Chiningus, a celebrated astrologer, had a knowledge of it 1120 years before Christ. The Chinese only divide their compass into 24 points. Fauchette relates some verses of Guoyot de Provence, who lived in France about the year 1200, which seem to make mention of the compass under the name of *marinette*, or *mariner's stone*; which show it to have been used in France near 100 years before either the Melfite or Venetian. The French even lay claim to the invention, from the *fleur de lys* wherewith all nations still distinguish the north point of the card. With as much reason Dr Wallis ascribes it to the English, from its name *compass*, by which name most nations call it, and which he observes is used in many parts of England to signify a circle.

Though the mariner's compass has been long in use, the best construction of it was attended with many inconveniences, till the improvements which it received from the invention and experiments of Dr Knight, and the farther emendation of Mr Smeaton.

The compass is sometimes observed to be disturbed by the electricity of its glass cover; and this from so slight an application of the finger as was barely necessary to wipe off a little dust. The same glass, rubbed a little more with the finger, a bit of muslin, or paper, would attract either end of the needle so as to hold it to the glass for several minutes, far out
of

Compass. of the due direction, according to that part of the glass which was most excited. And when the needle, after adhering to the glass, has dropped loose, and made vibrations, those would not be bisected as usual by that point where the needle should rest, but would either be made all on one side, or be very unequally divided, by means of some remains of electrical virtue in that part of the glass which had attracted the needle, until at length, after 15 minutes or more, all the electricity being discharged, the magnetical power took place. The remedy for this inconvenience is to moisten the surface of the glass; a wet finger will do it immediately and effectually. The mariner's compass with a chart is much less dangerously moved than the common compass with a bare needle; and the deeper, or farther distant, the needle hangs below the glass, the less disturbance it is likely to receive.

Improved sea-compasses have lately been constructed by Mr M'Culloch of London, for which he obtained a patent. The particulars are as follows.

Plate
CL.

Fig. 1. is a section of the steering compass. *a a a a* The common wooden-box, with its lid. *b b*, The brass compass-box. *c c*, The glass cover to ditto. *d d*, The hollow conical bottom. *e*, The prop upon which the compass is supported instead of gimbals; the spherical top of which is finely polished, and the apex of the hollow cone is fitted in a peculiar manner to receive it. *f f*, A quantity of lead run round the bottom and cone of the compass-box, to balance and keep it steadily horizontal. *g g*, The card and the magnetical needle, bent in such a manner that the point of the conical pivot on which it moves and is supported, may be brought very near to the centre of gravity, as well as to the centre of motion. *b b*, Two guards, which by means of two pins *i i*, affixed to the compass-box, prevents it from turning round and deceiving the steersman.

Fig. 2. a perspective view of the steering compass, with the lid off and the front laid open. *b b*, The guards. *b*, The compass-box. *e*, The prop, &c. as in fig. 1.

Fig. 3. a view of the azimuth compass. *b*, The compass-box. *b*, One of the guards. *e*, The prop. as in fig. 1. and 2. with this difference, that in an azimuth compass, instead of being screwed to the bottom of the wood-box, it stands in a brass socket, and may be turned round at pleasure. 1. A brass bar upon which the sight-vanes are fixed. 2. A dark glass, which moves up and down on 3. the sight-vane. 4. A magnifying glass, which is also moveable on the other vane. 5. The nonius or vernier. 6. A slide for moving the vernier so as to stop the card in taking the azimuth. 7. A double convex glass, by which the divisions on the vernier may be read with accuracy.

Fig. 4. is a section representing another application of the magnetic needle and card, constructed by Mr M'Culloch. *a a a a*, The common wood-box. *b b*, The brass compass-box. *c c*, The brass support for the circle and pendulum. *d*, The pendulum. *e*, The agate. *f f*, The magnetic needle and card. *g g*, The brass circle. *b b*, The glass cover and brass ring. *i*, The lead weight. *N. B.* All the centres of motion are in the same plane.

"In one particular this patent compass is considered as an improvement on the common compasses, in as far

as the needle is both longer and broader; hence its magnetism must be stronger, and of course the line of its magnetic direction correspondent with the card. In another particular, in order to prevent the motions of the vessel from affecting the needle, which is the most desirable object, the patent compass-box, instead of swinging in gimbals at right angles to each other, is supported in its very centre upon a prop; and whatever motion the other parts of the box may have, this centre being in the vertex of the hollow cone, may be considered as relatively at rest; and therefore gives little or no disturbance to the needle. Again, the pivot or centre upon which the needle turns, is so contrived as to stand always perpendicular over the centre of the compass-box, or apex of the hollow cone, as upon a fixed point; and is therefore still less affected by the motions of the vessel. Thus the centres of motion, gravity, and of magnetism, are brought almost all to the same point; the advantages of which will be readily perceived by any person acquainted with mechanical principles." *M'Culloch's Account.*

The following is a description of Dr Knight's azimuth compass, with the improvements of Mr Smeaton. Plate CLI. fig. 6. is a perspective view of the compass, when in order for observation; the point of view being the centre of the card, and the distance of the eye two feet. *A B* is the wooden box. *C* and *D* are two milled nuts; by means whereof the axes of the inner box and ring are taken from their edges on which they move, and the friction increased, when necessary. *E F* is the ring that supports the inner box. *G H* is the inner box; and *I* is one of its axes, by which it is suspended on the ring *E F*. The magnet or needle appears passing through the centre together with a small brace of ivory, that confines the cap to its place. The card is a single varnished paper, reaching as far as the outer circle of figures, which is a circle of thin brass; the edge whereof is turned down at right angles to the plane of the card, to make it grow stiff. *O* is a catgut line, drawn down the inside of the box, for determining the degree upon a brass edge. *P Q R S* is the index bar, with its two stiles and catgut threads; which being taken off from the top of the box, is placed in two pieces, *T* and *V*, notched properly to receive it. *W* is a place cut out in the wood, serving as a handle.

The use of the azimuth compass is for finding the sun's magnetical azimuth, or amplitude; and thence the variation of the compass. If the observation be for an amplitude at sun-rising, or for an azimuth before noon, apply the centre of the index on the west point of the card, within the box; so that the four lines on the edge of the card, and those on the inside of the box, may meet. If the observation be for the sun's amplitude setting, or an azimuth in the afternoon, turn the centre of the index right against the east point of the card, and make the lines within the box concur with those on the card: the instrument thus fitted for observation, turn the index *b c* towards the sun, till the shadow of the thread *a e* fall directly on the slit of the sight, and on the line that is along the middle of the index: then will the inner edge of the index cut the degree and minute of the sun's magnetical azimuth from the north or south. But note, that if, when the compass is thus placed, the azimuth is less than 54°

Compass. from the south, and the index turned towards the sun, it will pass off the divisions of the limb: the instrument therefore in this case must be turned just a quarter of the compass, i. e. the centre of the index must be placed on the north or south point of the card, according as the sun is from you; and then the edge will cut the degree of the magnetic azimuth, or the sun's azimuth from the north, as before.

The sun's magnetical amplitude thus found, the variation of the needle is thus determined. Being out at sea the 15th of May 1717, in 45° north latitude, the tables gave me the sun's latitude 19° north, and his east amplitude $27^{\circ} 25'$ north; by the azimuth compass, I find the sun's magnetical amplitude at his rising and setting; and find he rises, *e. gr.* between the 62d and 63d degree, reckoning from the north towards the east point of the compass, i. e. between the 27th and 28th degree, reckoning from the east. The magnetical amplitude, therefore, being here equal to the true one, the needle has no variation; but if the sun at his rising should have appeared between the 52d and 53d degree from the north towards the east; his magnetical amplitude would then have been between 37 and 38 degrees, i. e. about ten degrees greater than the true amplitude: therefore the needle would vary about 10 degrees north-easterly. If the magnetical east amplitude found by the instrument should be less than the true amplitude, their difference would show the variation of the needle easterly. If the true east amplitude be southward, as also the magnetical amplitude, and this last be the greater; the variation of the needle will be north-west; and *vice versa*.

What has been said of north-east amplitudes holds also of south-west; and what of south-east amplitudes holds of north-west. Lastly, if amplitudes be found of different denominations, *e. gr.* if the true amplitude be six degrees north, and the magnetical amplitude be six degrees south; the variation, which in this case is north-west, will be equal to the sum of the magnetical and true amplitudes; understand the same for west amplitudes.

The variation may likewise be found from the azimuth: but in that case the sun's declination, latitude of the place, and his altitude must be given, that his true azimuth may be found.

This instrument is also useful in settling the ship's wake, in order to find the leeway; and also to find the bearings of head-lands and other objects.

Experience evinces, that the needle of a compass, like every other magnet, whether natural or artificial, continually loses something of its magnetic powers, which frequently produces a difference of more than a point; and we may venture to assert, that the great errors in ships reckonings more commonly originate from the incorrectness of the compass than from any other cause.

Steel cannot be too highly tempered for the needle of a sea-compass, as the more it is hardened, the more permanent is the magnetism it receives; but to preserve the magnetism, and of course the polarity of the needle, it should be cased with thin, well-polished, soft iron. It has been found by repeated experiments, that the cased needle preserves its magnetism in a more perfect degree than a needle not cased; and perhaps

the magnetic power of the cased needle may increase, while that of the uncased needle loses of its polarity. Compass.

This is not an opinion hastily adopted, but the result of a fair and judicious trial, as the gentleman from whom the above observations were in substance taken, placed a cased and uncased needle in a room for three months, having at first exactly the same direction, and about the same degree of force. At the end of this period it was found that the cased needle had not in the least changed its direction, while the uncased had varied two degrees, and its magnetic power was considerably diminished.

These remarks have the air of novelty, and may perhaps contribute to the improvement of the compass. But the defects of this instrument are not confined to the needle. The heaviest brass compasses are not to be implicitly trusted in a hollow or high sea, as they have the box hanging in two brass rings, thus allowing it to have only two motions, both vertical and at right angles with each other; by which confinement of the box, upon any succussion, particularly sudden ones, the card is always too much agitated, and before it can recover itself, another jerk prevents it from pointing to the pole. It is even not uncommon to see the card unshipped by the violence of the ship's pitching.

All these defects are abundantly supplied by giving the box a vertical motion at every degree and minute of the circle, and combining these motions with a horizontal one of the box as well as of the card. By this disposition of the box, the effects of the jerks on the card are avoided, and it will always with steadiness point to the pole. Mr Bernard Romans found by experience, that the card not only is not in the smallest degree affected by the hollow sea, but that, in all the violent shocks and whirlings which it is possible for the box to receive, the card lies as still as in a room unaffected by the least motion.

A compass was recently invented and made in Holland having all these motions. It is about the size of the brass compass commonly used. The bottom of the brass box, instead of being shaped like a bowl, must be a hollow cone resembling the bottom of a common glass bottle; the vertex of it must be raised so high as to leave only one inch between the card and the glass; the box must be of the usual depth, and a quantity of lead must be poured in the bottom of the box, round the base of the cone, which secures it on the stile whereon it traverses.

This stile is firmly fixed in the centre of a square wooden box, like the common compass, but with a thicker bottom. The stile is made of brass, about six inches long, round, and one-third of an inch thick, having its head blunt like that of a sewing thimble, and of a fine polish, and placed perpendicular. The inner vertex of the cone must likewise be well polished. The vertical part of the cone ought to be sufficiently thick to allow a well-polished cavity for holding a short stile, proceeding from the centre of the card on which it traverses. "The compass I saw, (says Mr Romans), was so constructed; but I see no reason why the stile might not proceed from the centre of the vertex of the cone, and so be received by the card the common way. The needle must be a magnetic

Compass.

netic bar, blunt at each end; the glass and cover are put on in the common way."

The above gentleman informs us that a similar compass was submitted to his inspection by the captain of a sloop of war, who declared that during a hard gale of some days continuance, he had no other compass that was of the smallest use. In the opinion of Mr Romans the account was not exaggerated, in which conclusion we are disposed to join issue with him.

Yet Mr Nicholson in his interesting journal is of an opposite sentiment, who believes that the compass is very little disturbed by tilting the box on one side, but very much by sudden changes of place in a horizontal direction; that provision made against the latter in a scientific manner is the chief requisite in a well constructed instrument of this nature; and that no other provision is necessary than good workmanship agreeably to the common construction, and properly adjusting the weight respecting the centres and axes of suspension. He conceives it will improve the compass very much to make the needle flat and thin, and to suspend it, not in the common way, with its flat side, but with its edge uppermost; for as it is known that hard steel retains its magnetism longer than soft, it follows that, except both sides of a needle be equally hard, the magnetic virtue will incline towards the harder side in process of time.

The Chinese compass has some advantages over the European, from which it differs in the length of the needle, and the manner of its suspension. The needle of the Chinese seldom exceeds an inch in length, and is scarcely a line in thickness. It is poised with great nicety, and is remarkably sensible. This is effected by the following contrivance.

A piece of thin copper is strapped round the centre of the needle. This copper is rivetted by its edges to the upper part of a small hemispherical cup of the same metal, turned downwards. The cup thus inverted serves as a socket to receive a steel pivot rising from a cavity made in a round piece of light wood or cork, which forms the compass-box. The surfaces of the socket and pivot, intended to coincide, are highly polished, to prevent friction as much as possible. The cup has a proportionably broad margin, which not only adds to its weight, but from its horizontal position tends to keep the centre of gravity in every situation of the compass, nearly coinciding with the centre of suspension. The cavity in which the needle is suspended, is circular, and little more than capable to remove the needle, cup and pivot. A thin piece of transparent talc is placed over the cavity, which hinders the needle from being affected by the motion of the external air; but allows the apparent motion of the former to be easily observed. The small short needle of the Chinese has a singular advantage over those commonly used in Europe, in respect of the dip towards the horizon; which, in the latter, requires that one extremity of the needle should be made so much heavier than the other as will sufficiently counteract the magnetic attraction. This being different in different parts of the world, the needle can only be accurately true at the place for which it has been constructed. But in short and light needles, suspended after the Chinese manner, the weight below the point of suspension is more than sufficient to overcome the

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magnetic dip in all situations of the globe; and consequently such needles will never deviate from their horizontal position. Compass.

COMPASS is also an instrument of considerable use in surveying land, dialing, &c.

Its structure, in the main, is the same with that of the mariner's compass; consisting like that of a box and needle: the principal difference consists in this, that instead of the needle's being fitted into the card, and playing with it on a pivot, it here plays alone; the card being drawn on the bottom of the box, and a circle divided into 360 degrees on the limb. See fig. 5. Plate CL. This instrument is of obvious use to travellers, to direct them in their road; and to miners, to show them what way to dig, with other considerable uses.

1. *To take the declination of a wall by the Compass.* Apply that side of the compass whereon the north is marked along the side of the wall; the number of degrees over which the north end of the needle fixes will be the declination of the wall, and on that side; e. g. if the north point of the needle tends towards the north, that wall may be shone on by the sun at noon; if it fix over fifty degrees, counting from the north towards the east, the declination is so many degrees from north towards east.

But since the needle itself declines from the north towards the west, with us, 13° ; it must be noted, that to retrieve the irregularity, 13° are always to be added to the degrees shown by the needle, when the declination of the wall is towards the east; on the contrary, when the declination is towards the west, the declination of the needle is to be subtracted.

2. *To take an angle with the Compass.* Suppose the angle required be DAE, fig. 4. apply that side of the compass whereon the north is marked to one of the lines AD; when the needle rests, observe the degrees at which its north point stands, which suppose 80° : so many degrees does the line decline from the meridian. In the same manner take the declination of the line AE, which suppose 215° ; subtract 80° from 215° , the remainder is 135° ; which subtracted from 180° , there will remain 45° ; the quantity of the angle required. But if the difference between the declination of the two lines exceed 180° ; in that case, 180° must be subtracted from that difference; the remainder then is the angle required.

In measuring angles by the compass, there needs not any regard be had to the variation; that being supposed the same in all the lines of the angles.

3. *To take a plot of a field by the Compass.* Suppose the field A, B, C, D, E, fig. 10. for the greater accuracy let there be two sights fitted to the meridian line of the compass; place it horizontally, and through the sights look along the side AB, or a line parallel to it; applying the eye to the sight at the south point of the compass. Draw a rough sketch of the field by the eye, and on the corresponding line enter down the degree to which the needle points, which suppose 90° ; measure the length of the side, and enter that too, which suppose 10 chains.

In this manner proceed with all the rest of the sides and angles of the field; the sides, which suppose 70, 65, 70, 44, 50 fathom; and the angles, which suppose 30° , 100° , 130° , 240° , 300° degrees. To protract the field, set down the several angles observed, one

3 A

after

Compass,
Compasses.

after another, and subtract the lesser from the next greater: thus will you have the quantity of the several angles, and the length of the lines that include them. For the rest, see GEOMETRY.

Note. All the angles of the figure taken together, must make twice as many right angles; abating two if no mistake has been committed.

Azimuth COMPASS. See AZIMUTH.

COMPASS-DIALS, are small horizontal dials, fitted in brass or silver boxes, for the pocket, to show the hour of the day, by the direction of a needle that indicates how to place them right, by turning the dial about till the cock or style stands directly over the needle; but these can never be very exact, because of the variation of the needle itself. See COMPASS and DIALING.

COMPASSES, or *Pair of COMPASSES*, a mathematical instrument for describing circles, measuring figures, &c.

The common compasses consist of two sharp-pointed branches or legs of iron, steel, brass, or other metal, joined together at the top by a rivet, whereon they move as on a centre. Those compasses are of the best sort in which the pin or axle on which the joint turns, and also half the joint itself, is made of steel, as the opposite metals wear more equably. The perfection of them may be known by the easy and uniform opening and shutting of their legs; one of which is sometimes made to take in and out, in order to make room for two other points to describe with ink, black-lead or other materials.

There are now used compasses of various kinds and contrivances, accommodated to the various uses they are intended for; as,

COMPASSES of three Legs, or Triangular Compasses, are, setting aside the excels of a leg, of the same structure with the common ones; their use being to take three points at once, and so to form triangles; to lay down three positions of a map, to be copied at once, &c.

Beam-COMPASSES consist of a long branch, or beam, made of brass or wood, carrying two brass cursors, the one fixed at one end, the other sliding along the beam, with a screw to fasten it occasionally. To the cursors may be screwed points of any kind, whether steel for pencils, or the like. It is used to draw large circles, to take great extents, &c. To the fixed cursor is sometimes applied an adjusting or micrometer screw, by which an extent is obtained to extreme nicety. Mr Jones of Holborn has made beam-compasses to adjust to the $\frac{1}{30000}$ th of an inch.

Caliber COMPASSES. See CALIBER.

Clockmaker's COMPASSES are joined like the common compasses, with a quadrant, or bow, like the spring compasses; only of different use, serving here to keep the instrument firm at any opening. They are made very strong, with the points of their legs of well tempered steel, as being used to draw lines on pasteboard or copper.

Cylindrical and Spherical COMPASSES, consist of four branches, joined in a centre, two of which are circular, and two flat, a little bent on the ends: their use is to take the diameter, thickness, or caliber of round or cylindrical bodies; such as cannons, pipes, &c.

Plate CL.
fig. 9.

Elliptic COMPASSES. Their use is to draw ellipses, or ovals of any kind; they consist of a beam AB

about a foot long, bearing three cursors; to one of which may be screwed points of any kind: to the bottom of the other two are rivetted two sliding dove-tails, adjusted in grooves made in the cross branches of the beam. The dove-tails having a motion every way, by turning about the long branch, go backwards and forwards along the cross; so that when the beam has gone half-way about, one of these will have moved the whole length of one of the branches; and when the beam has got quite round, the same dove-tail has got back the whole length of the branch. Understand the same of the other dove-tail.

Note. The distance between the two sliding dove-tails is the distance between the two foci of the ellipsis; so that by changing that distance, the ellipsis will be rounded or slenderer. Under the ends of the branches of the cross are placed four steel points to keep it fast.

The use of this compass is easy; by turning round the long branch, the ink, pencil, or other point, will draw the ellipsis required. Its figure shows both its use and construction.

German COMPASSES have their legs a little bent outwards, towards the top; so that when shut, the points only meet.

Hair COMPASSES are so contrived within side by a small adjusting screw to one of the legs, as to take an extent to a hair's breadth.

Lapidary's COMPASSES are a piece of wood, in form of the shaft of a plane, cleft at top, as far as half its length; with this they measure the angles, &c. of jewels and precious stones, as they cut them. There is in the cleft a little brass rule, fastened there at one end by a pin; but so that it may be moved in the manner of a brass level: with this kind of square they take the angles of the stones, laying them on the shaft as they cut them.

Proportional COMPASSES are those whose joint lies between the points terminating each leg: they are either simple or compound. In the former sort the centre is fixed, so that one pair of these serves only for one proportion.

Compound proportional COMPASSES consist of two parts or sides of brass, which lie upon each other so nicely as to appear but one when they are shut. These sides easily open, and move about a centre, which is itself moveable in a hollow canal cut through the greatest part of their length. To this centre on each side is affixed a sliding piece A of a small length, with a fine line drawn on it serving as an index, to be set against other lines or divisions placed upon the compasses on both sides. These lines are 1. A line of lines. 2. A line of superficies, areas, or planes. 3. A line of solids. 4. A line of circles, or rather of polygons to be inscribed in circles. These lines are all unequally divided; the three first from 1 to 20, the last from 6 to 20. Their uses are as follow:

By the line of lines you divide a given line into any number of equal parts; for by placing the index A against 1, and screwing it fast, if you open the compasses, then the distance between the points at each end will be equal. If you place the index against 2, and open the compasses, the distance between the points of the longer legs BB, will be twice the distance between the shorter ones CC; and thus a line is bisected, or divided into two equal parts. If the index be placed against

Plate CL.
fig. 6.

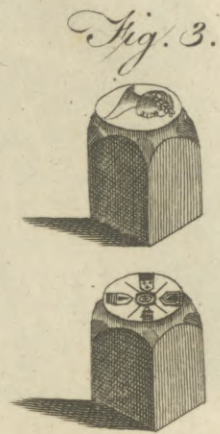
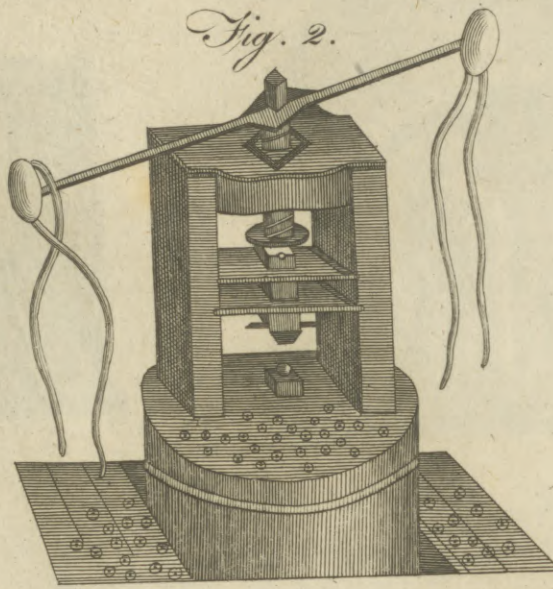


Fig. 8.

COMPASS.

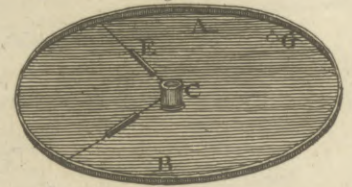
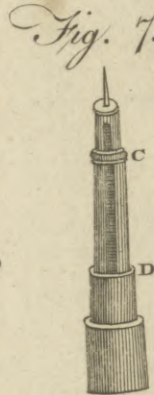
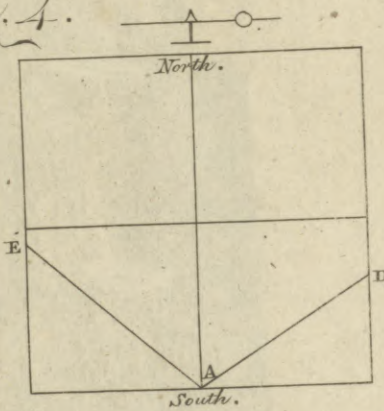
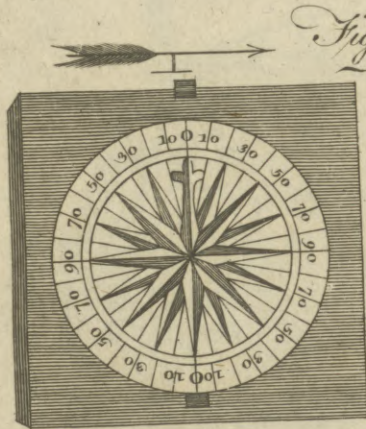


Fig. 9.

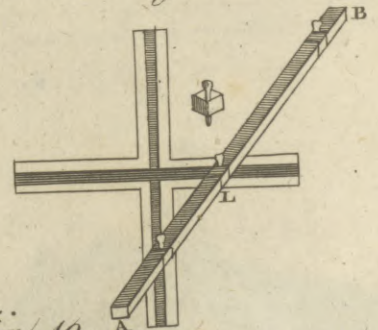


Fig. 5.

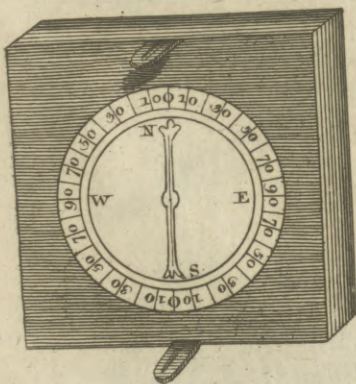
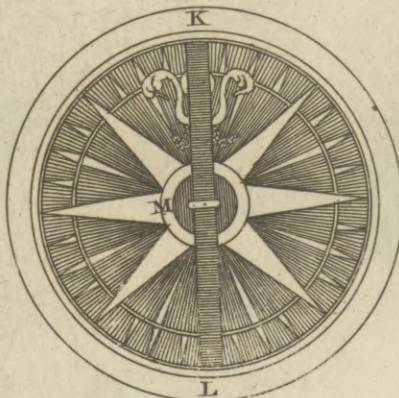


Fig. 6.



Abell Pinx. Wal. Sculptor fecit.

Fig. 1.

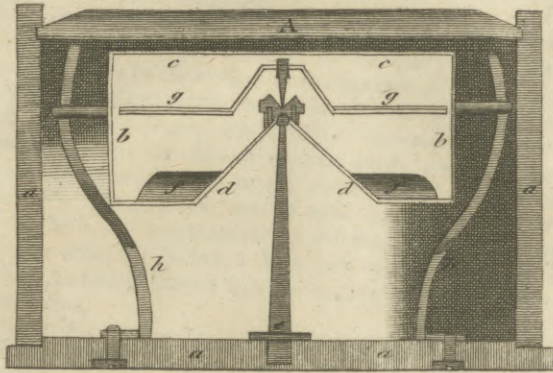


Fig. 2.

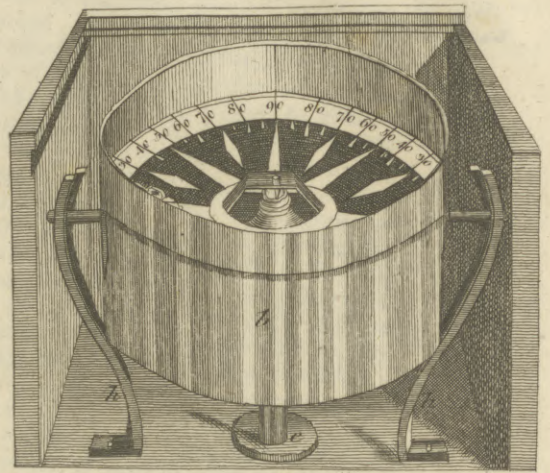


Fig. 3.

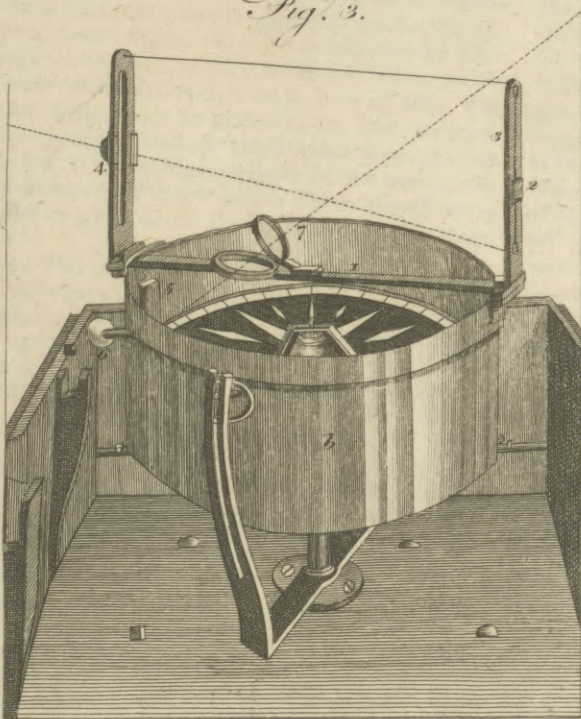


Fig. 4.

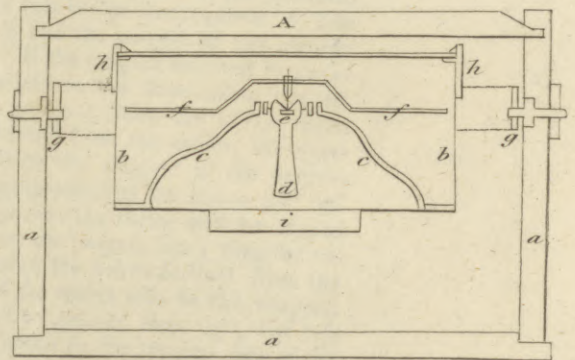
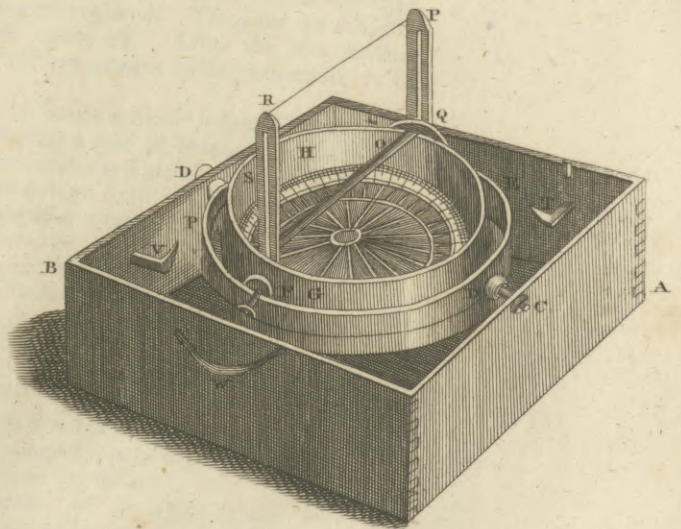
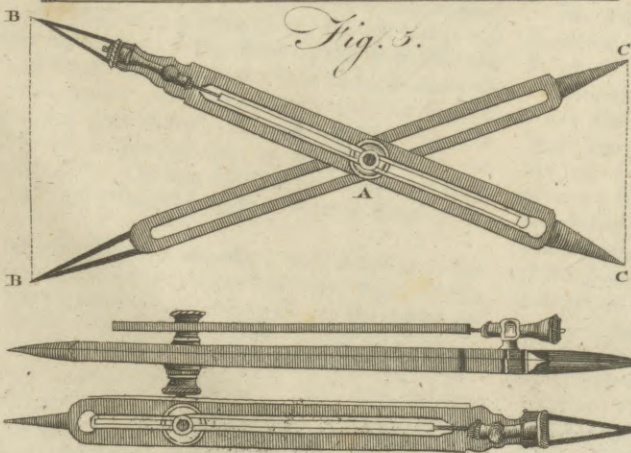
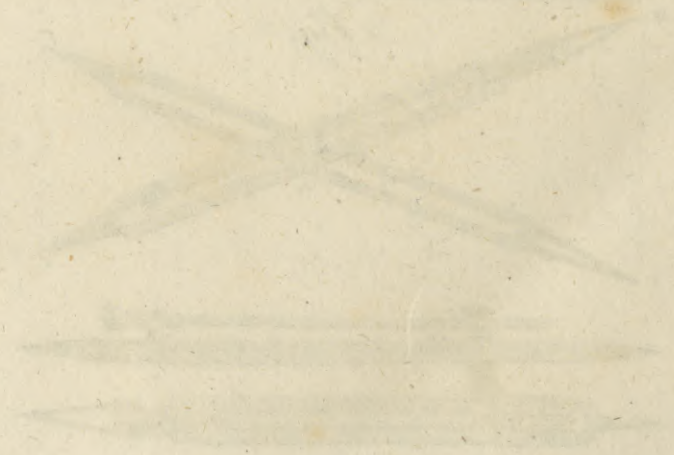
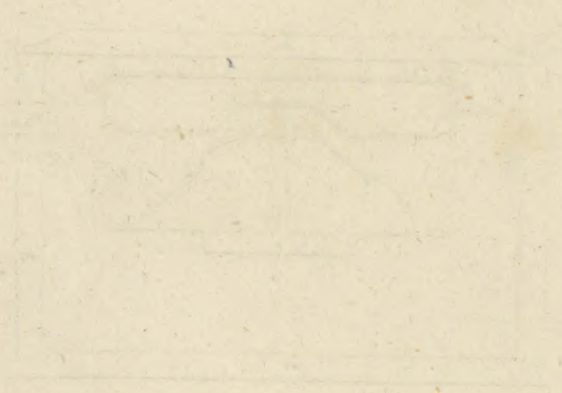


Fig. 5.





Compasses. against 3, and the compasses opened, the distances between the points will be as 3 to 1, and so a line is divided into 3 equal parts; and so you proceed for any other number of parts under 10.

The numbers of the line of planes answer to the squares of those in the line of lines; for because superficies or planes are to each other as the squares of their like sides; therefore, if the index be placed against 2 in the line of planes, the distance between the small points will be the side of a plane whose area is one; but the distance of the larger points will be the like side of a plane whose area is two; or twice as large. If the index be placed at 3, and the compasses opened, the distances between the points at each end will be the like side of planes whose areas are as 1 to 3; and so of others.

The numbers of the line of solids answer to the cubes of those of the line of lines; because all solids are to each other as the cubes of their sides or diameters: therefore, if the index be placed to number 2, 3, 4, &c. in the line of solids, the distance between the lesser and larger points will be the like sides of solids, which are to each other as 1 to 2, 1 to 3, 1 to 4, &c. For example; If the index be placed at 10, and the compasses be opened so that the small points may take the diameter of a bullet whose weight is one ounce, the distance between the large points will be the diameter of a bullet or globe of 10 ounces, or which is 10 times as large.

Lastly, The numbers in the line of circles are the sides of polygons to be inscribed in a given circle, or by which a circle may be divided into the equal parts, from 6 to 20. Thus, if the index be placed at 6. the points of the compasses at either end, when opened to the radius of a given circle, will contain the side of a hexagon, or divide the circle into six equal parts. If the index be placed against 7, and the compasses opened so that the larger points may take in the radius of the circle, then the shorter points will divide the circle into seven equal parts, for inscribing a heptagon. Again, placing the index to 8, and opening the compasses, the larger points will contain the radius, and the lesser points divide the circle into eight equal parts for inscribing an octagon or square. And thus you may proceed for others.

Proportional COMPASSES with the sector lines. The structure of these is so like that of the common proportional compasses, only a little nicer, that it needs no particular description. The lines on the first face are the line of lines, marked *lines*; it is divided into 100 equal parts, every tenth numbered: and the line of chords, which goes to 60° , is marked *chords*. On the other face are a line of sines to 90° , and a line of tangents to 45° . On one side are the tangents from 45° to $71^\circ 34'$; on the other, secants from 0° to $70^\circ 30'$.

For the use of these compasses: 1. To divide a line into any number of equal parts less than 100: divide 100 by the number of parts required; slip the cursor till the line on the sliding dove-tail be against the quotient on the line of lines: then, the whole line being taken between the points of the compasses most remote from the centre, the aperture of the other will show the division required. 2. A right line given, supposed to be divided into 100 parts, to take any number of those

parts; slip the line on the sliding dove-tail to the number of parts required: the whole line being taken between the points farthest from the centre, the aperture of the other two will include the number of divisions required. 3. The radius being given, to find the chord of any arch under 60° ; slip the line on the sliding dove-tail to the degrees required on the line of chords: the radius being taken between the points farthest from the centre of the cursor; the aperture of the other line will be the chord required, provided the number of degrees be greater than 29: if it be less, the aperture taken from the radius will leave the chord required. 4. If the chord of an arch under 60° be given, and the radius required; slip the line on the dove-tail to the degrees given on the line of chords: the given chord being taken between the two points next the cursor, the aperture of the other will be the radius required. 5. The radius being given, to find the sine of any number of degrees; slip the line on the dove-tail to the degree on the line of sines whose sine is required: the radius taken between the points furthest from the cursor, the aperture of the other will give the sine of the angle required. But if the sine sought be less than 30° , the difference of the apertures of the opposite points will be the sine required. 6. The radius being given, to find the tangent of any number of degrees under 71: if the tangent required be under $26^\circ 30'$, then slip the line on the dove-tail to the degree proposed on the tangent line; the radius taken between the points farthest from the cursor, the aperture of the others will be the tangent of the degrees required; if the tangent required be above $26^\circ 30'$ but under 45° , the line on the cursor must be slipped to the degrees given on the tangent line; then the radius being taken between the points furthest from the cursor, the aperture of the others will be the tangent. If the tangent required be greater than 45° , but less than $56^\circ 20'$, slip the notch on the tangent side of the turned-cheek to the degree 0 in the tangent line on the side of the compass; the radius taken between the points furthest from the cursor; the difference between the aperture of the other and these, added together, will be the tangent required. Thus, for the tangents of the degrees under 71. After the like manner may the secant of any number of degrees under 71 be found.

Mr Heath, a mathematical instrument-maker in London, constructed a pair of proportional compasses, in 1746, with a curious and useful contrivance for preventing the shorter legs from changing their position, when these compasses were used. It consisted of a small beam soldered to a screw, and running parallel to the leg of the compasses, nearly of the length of the groove; in this beam a slit was made, which admitted of a sliding-nut, the other end of which fell into a hole in the bottom of the screw, belonging to the great nut of the compasses. The screw-pin of the beam passed through an adjuster, by means of which the mark on the slider might be brought exactly to any division. But the proportional compasses have been much out of use since the invention of the sector.

Spring COMPASSES, or dividers; those with an arched head, which by its spring opens the legs; the opening being directed by a circular screw fastened to one of the legs, and let through the other, worked

Compasses with a nut. These compasses are made of hardened steel.

Competition.

Trifecting COMPASSES consist of two central rules, and an arch of circles of 120 degrees, immovable, with its radius, which is fastened with one of the central rules like the two legs of a sector, that the central rule may be carried through all the points of the circumference or the arch. The radius and rule should be as thin as possible; and the rule fastened to the radius should be hammered cold, to attain the greater elasticity; and the breadth of the central rule should be triple that of the radius; there must also be a groove in this rule, with a dove-tail fastened on it for its motion, and a hole in the centre of each rule. The use of this instrument is to facilitate the trifecting of angles geometrically; and it is said to have been invented by M. Targen for that purpose.

Turn-up COMPASSES. The body of this instrument is like the common compasses; but towards the bottom of the legs, without-side, are added two other points besides the usual ones; the one whereof carries a drawing-pen point, and the other a port-crayon, both adjusted so as to turn round, and be in the way of use, or out of it, as occasion requires. These compasses have been contrived to save the trouble of changing the points.

COMPASSION, or COMMISERATION, in *Ethics*, a mixed passion compounded of love and sorrow, and excited by the sight or recital of distress. Hobbes makes this a merely selfish passion, and defines it, as being fear for ourselves; Hutcheson resolves it into instinct; but Dr Butler much more properly considers compassion as an original, distinct, particular affection in human nature.

COMPATIBLE, something that may suit or consist with another. See INCOMPATIBLE.

COMPEIGNE, a handsome town of France, in the department of Oise, with a palace, or castle, where the king often resided. The maid of Orleans was taken prisoner here in 1430. It is seated on the river Oise, near a large forest. E. Long. 2. 55. N. Lat. 49. 25. It stands about 45 miles north-east of Paris.

COMPENDIUM, in matters of literature, denotes much the same as epitome or abridgment. See ABRIDGMENT.

COMPENSATION, in a general sense, an action whereby any thing is admitted as an equivalent to another.

COMPENSATION, in *Law*. When the same person is debtor and creditor to another, the mutual obligations, if they are for equal sums, are extinguished by compensation; if for unequal, the lesser obligation is extinguished, and the greater diminished, as far as the concurrence of debt and credit goes.

COMPETENCE, or COMPETENCY, in a general sense, such a quantity of any thing as is sufficient.

COMPETENCY, in *Law*, the right or authority of a judge, whereby he takes cognizance of any thing.

COMPETENTES, an order of catechumens, in the primitive Christian church, being the immediate candidates for baptism. See CATECHUMEN.

COMPETITION, in a general sense, is the same with rivalry, or when two or more persons contend for the same thing.

COMPETITION, in *Scots Law*. In escheats, see *LAW*, Part III. N° clxvi. 17, &c. In confirmations by the superior, in resignations, and in personal rights of lands, *ibid.* clxviii. 5—9. In inhibitions, in adjudication, amongst assignees, arresters, and pounders, *ibid.* clxxi. 6. clxxii. 3. clxxvii. 2. clxxviii. 8, 9, 10. Amongst creditors of a defunct, clxxxix. 19.

COMPITALIA, or COMPITALITA, feasts held among the ancients in honour of the *lares*. The word comes from the Latin *compitum*, a cross-way; because the feast was held in the meeting of several roads. The *compitalia* are more ancient than the building of Rome. Dionysius Halicarnassus, and Pliny, indeed, say, they were instituted by Servius Tullius; but this only signifies that they were then introduced into Rome. The feast being moveable, the day whereon it was to be observed was proclaimed every year. It was ordinarily held on the 4th of the nones of February, i. e. on the 2d of that month. Macrobius observes, that they were held not only in honour of the *lares*, but also of *mania*, madness. The priests who officiated at them were slaves and liberti, and the sacrifice a sow. They were re-established, after a long neglect, by Tarquin the Proud, on occasion of an answer of the oracle, *that they should sacrifice heads for heads*; i. e. that for the health and prosperity of each family, children were to be sacrificed: but Brutus, after expelling the kings, in lieu of those barbarous victims substituted the heads of garlic and poppy; thus satisfying the oracle which had enjoined *capita*, heads. During the celebration of this feast, each family placed at the door of their house the statue of the goddess *Mania*: they also hung up at their doors figures of wool, representing men and women; accompanying them with supplications that the *lares* and *mania* would be contented with those figures, and spare the people of the house.

COMPLEMENT, in *Geometry*, is what remains of the quadrant of a circle, or 90°, after any certain arch has been taken away from it. Thus, if the arch taken away be 40°, its complement is 50; because 50+40=90. The sine of the complement of an arch is called the *cosine*, and that of the tangent the *cotangent*, &c.

COMPLETUS FLOS, in *Botany*. A flower is said to be complete, which is provided with both the covers, viz. the calyx or flower-cup, and the petals. The term was invented by Vaillant, and is synonymous with *calyculatus flos* in Linnæus. Berkenhout erroneously confounds it with the *avellus* and *calyculatus calyx* of the same author.

COMPLEX, in a more general sense, a term synonymous with compound; though in strictness of speech there is some difference.

COMPLEX is properly applied where a thing contains many others, or consists of different parts not really distinct from each other, but only imaginarily, or in our conceptions. In this sense the soul may be said to be complex, in respect of the understanding and will, which are two things that our reason alone distinguishes in it.

COMPLEX Term or Idea, is a term compounded of several simple or incomplex ones. This in the proposition, *A just God cannot leave crimes unpunished*; the subject of this proposition, viz. *a just God*, is a complex.

Competition
Complex.

Complexion.

plex term, or stands for a complex idea composed of two simple or incomplex ones, viz. *God* and *just*.

COMPLEXION, among physicians, the temperament, habitude, and natural disposition, of the body; but more often the colour of the face and skin.

Few questions in philosophy have engaged the attention of naturalists more than the diversities among the human species, among which that of colour is the most remarkable. The great differences in this respect have given occasion to several authors to assert, that the whole human race have not sprung from one original; but that as many different species of men were at first created as there are now different colours to be found among them. Under the article AMERICA, N^o 81—100, we have shown that all the arguments which can be brought for specific differences among mankind, whether drawn from a difference of colour, stature, or disposition, must necessarily be inconclusive. It remains, however, a matter of no small difficulty to account for the remarkable variations of colour that are to be found among different nations. On this subject Dr Hunter has published a thesis, in which he considers the matter more accurately than has commonly been done, and determines absolutely against any specific difference among mankind. He introduces his subject by observing, that when the question has been agitated, whether all the human race constituted only one species or not, much confusion has arisen from the sense in which the term *species* has been adopted. He therefore thinks it necessary to set out with a definition of the term. He includes under the same species all those animals which produce issue capable of propagating others resembling the original stock from whence they sprung. This definition he illustrates by having recourse to the human species as an example. And in this sense of the term he concludes, that all of them are to be considered as belonging to the same species. And as, in the case of plants, one species comprehends several varieties depending upon climate, soil, culture, and similar accidents; so he considers the diversities of the human race to be merely varieties of the same species, produced by natural causes. Of the different colours observable among mankind, he gives the following view:

- BLACK.** Africans under the line.
Inhabitants of New Guinea.
Inhabitants of New Holland.
- SWARTHY.** The Moors in the northern parts of Africa.
The Hottentots in the southern parts of it.
- COPPER COLOURED.** The East Indians.
- RED COLOUR D.** The Americans.
- BROWN-COLOURED.** Tartars.
Persians.
Arabs.
Africans on the coast of the Mediterranean.
Chinese.
- BROWNISH.** The inhabitants of the southern parts of Europe; as Sicilians, and Spaniards; as well as the Abyssinians in Africa.

BROWNISH. Turks, and likewise the Samoiedes and Laplanders. Complexion.

WHITE. Most of the European nations; as
Swedes,
Danes,
English,
Germans,
Poles, &c.
Kabardinski,
Georgians,
Inhabitants of the islands in the Pacific ocean.

IN attempting to investigate the causes of these differences, our author observes, that there can be no dispute of the seat of colour being placed in the skin; that it is not even extended over the whole of this, but confined to that part named the cuticle, consisting of the epidermis and reticulum; and that it chiefly occupies the latter of these. The cuticle is much thicker and harder in black people than in white ones; the reticulum in the latter being a thin mucus, in the former a thick membrane. He concludes that this seat of colour in whites is transparent, and either totally deprived of vessels, or only furnished with very few; as the yellow colour appearing in jaundice vanishes on the cause of the disease being removed; which is not the case with stains in the cuticle from gunpowder, or similar causes. He next points out three causes destroying the pellucidity of the cuticle, giving it a brown colour, and rendering it thicker. These are, access of air, nastiness, and the heat of the sun. The influence of each of these he proves by many examples; and from these he is inclined to consider the last as by much the most powerful. If, however, it be admitted that these causes have this effect, he thinks that all the diversity of colour which is to be observed among mankind, may be thus accounted for. He remarks, that all the inhabitants of the torrid zone incline more or less to a black colour. When we observe the differences which occur among them, we must at the same time remember, that a black colour is not referred to heat alone, but to the other causes also: and when we attend to the diversity of temperature that occurs even in the torrid zone, the existence of a white nation there would by no means destroy the argument. He is farther of opinion, that the existence of a brown colour, and of considerable varieties from white, in the northern and coldest parts of Europe, may very easily be explained. This he accounts for from the manner of life of the inhabitants, by which they are either exposed to the inclemency of the air, or to constant nastiness from smoky houses.

Having thus attempted to account, from natural causes, for the varieties which occur among mankind with respect to colour, our author observes, that, to all this reasoning, an objection will naturally be made, from considering that infants bring these marks into the world along with them, before they can be exposed to any such causes. Dr Hunter imagines, however, that this may readily be explained upon the supposition that many peculiarities acquired by parents are transmitted to their posterity; and of this, he thinks, no one can entertain the least doubt who attends.

Complexion.

tends to hereditary diseases. Thus, gout, scrophula, mania, and many other affections, although at first induced by particular accidents, will continue to affect families for many generations. In the same manner, a parent exposed to causes destroying the natural whiteness of his complexion, will beget swarthy children; and the same causes continuing to operate upon the son, the blackness will be increased. Thus all the different shades may have been at first induced, and afterwards continued.

The objection here obviated, however, might have been shortly answered by denying the fact; for it is now generally known, that the children of the blackest negroes are absolutely *born white*, as will be afterwards noticed.

This subject of complexion has been very well illustrated by Mr Clarkfon, in a dissertation introduced in his Essay on the commerce and slavery of the human species. The first point that occurs to be ascertained, is, 'What part of the skin is the seat of colour?' The old anatomists usually divided the skin into two parts or laminæ; the exterior and thinnest, called by the Greeks *epidermis*, by the Romans *cuticula*, and hence by us *cuticle*; and the interior, called by the former *derma*, and by the latter *cutis*, or *true skin*. Hence they must necessarily have supposed, that, as the true skin was in every respect the same in all human subjects, however various their external hue, so the seat of colour must have existed in the cuticle or upper surface.

Malpighi, an eminent Italian physician of the last century, was the first person who discovered that the skin was divided into three laminæ or parts; the cuticle, the true skin, and a certain coagulated substance situated between both, which he distinguished by the title of *rete mucosum*; which coagulated substance adhered so firmly to the cuticle, as, in all former anatomical preparations, to have come off with it; and, from this circumstance, to have led the ancient anatomists to believe, that there were but two laminæ, or divisible portions in the human skin. See ANATOMY *Index*.

This discovery was sufficient to ascertain the point in question; for it appeared afterwards that the cuticle, when divided according to this discovery from the other lamina, was semitransparent; that the cuticle of the blackest negro was of the same transparency and colour as that of the purest white; and hence the true skins of both being invariably the same, that the rete mucosum was the seat of colour.

This has been farther confirmed by all subsequent anatomical experiments; by which it appears, that, whatever is the colour of this intermediate coagulated substance, nearly the same is the apparent colour of the upper surface of the skin. Neither can it be otherwise; for the cuticle, from its transparency, must necessarily transmit the colour of the substance beneath it, in the same manner, though not in the same degree, as the cornea transmits the colour of the iris of the eye. This transparency is a matter of ocular demonstration in white people. It is conspicuous in every blush; for no one can imagine that the cuticle becomes red as often as this happens: nor is it less discoverable in the veins, which are so easy to be discerned; for no one can suppose that the blue streaks, which he constantly sees in the fairest complexions, are

Complexion. painted, as it were, on the surface of the upper skin. From these, and a variety of other observations, no maxim is more true in physiology, than that on the rete mucosum depends the colour of the human body; or in other words, that the rete mucosum being of a different colour in different inhabitants of the globe, and appearing through the cuticle or upper surface of the skin, gives them that various appearance which strikes us so forcibly in contemplating the human race.

As this can be introvertibly ascertained, it is evident, that whatever causes co-operate in producing this different appearance, they produce it by acting upon the rete mucosum; which from the almost incredible manner in which the cuticle is perforated, is as accessible as the cuticle itself. These causes are probably those various qualities of things, which, combined with the influence of the sun, contribute to form what we call *climate*. For when any person considers, that the mucous substance before mentioned is found to vary in its colour, as the climates vary from the equator to the poles, his mind must be instantly struck with the hypothesis, and he must adopt it without any hesitation, as the genuine cause of the phenomenon.

This fact, of the variation of the mucous substance, according to the situation of the place, has been clearly ascertained in the numerous anatomical experiments that have been made; in which subjects of all nations have come under consideration. The natives of many of the kingdoms and isles of Asia are found to have their rete mucosum black: those of Africa, situated near the line, of the same colour; those of the maritime parts of the same continent, of a dusky brown, nearly approaching to it; and the colour becomes lighter or darker in proportion as the distance from the equator is either greater or less. The Europeans are the fairest inhabitants of the world. Those situated in the most southern regions of Europe, have in their rete mucosum a tinge of the dark hue of their African neighbours: hence the epidemic complexion prevalent among them, is nearly of the colour of the pickled Spanish olive; while in this country, and those situated nearer the north pole, it appears to be nearly, if not absolutely, white.

These are facts which anatomy has established; and we acknowledge them to be such, that we cannot divest ourselves of the idea, that climate has a considerable share in producing a difference of colour.

The only objection of any consequence that has ever been made to the hypothesis of climate, is this, that people under the same parallels are not exactly of the same colour. But this is no objection in fact; for it does not follow that those countries which are at an equal distance from the equator, should have their climates the same. Indeed nothing is more contrary to experience than this. Climate depends upon a variety of accidents. High mountains in the neighbourhood of a place make it cooler, by chilling the air that is carried over them by the winds. Large spreading succulent plants, if among the productions of the soil, have the same effect; they afford agreeable cooling shades, and a moist atmosphere from their continual exhalations, by which the ardour of the sun is considerably abated. While the soil, on the other hand, if of a sandy nature, retains the heat in an uncommon degree,

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degree, and makes the summers considerably hotter than those which are found to exist in the same latitude where the soil is different. To this proximity of what may be termed *burning sands*, and to the sulphureous and metallic particles which are continually exhaling from the bowels of the earth, is ascribed the different degree of blackness by which some African nations are distinguished from each other, though under the same parallels. To these observations we may add, that though the inhabitants of the same parallel are not exactly of the same hue, yet they differ only by shades of the same colour; or, to speak with more precision, that there are no two people, in such a situation, one of whom is white and the other black. To sum up the whole—Suppose we were to take a common globe; to begin at the equator; to paint every country along the meridian line in succession from thence to the poles; and to paint them with the same colour which prevails in the respective inhabitants of each, we should see the black, with which we had been obliged to begin, insensibly changing to an olive, and the olive, through as many intermediate colours, to a white; and if, on the other hand, we should complete any one of the parallels according to the same plan, we should see a difference perhaps in the appearance of some of the countries through which it ran, though the difference would consist wholly in shades of the same colour.

The argument, therefore, which is brought against the hypothesis, is so far from being an objection, that it may be considered as one of the first arguments in its favour; for if climate has really an influence on the mucous substance of the body, it is evident, that we must not only expect to see a gradation of colour in the inhabitants from the equator to the poles, but also different shades of the same colour in the inhabitants of the same parallel.

To this argument may be added one that is incontrovertible, which is, that when the black inhabitants of Africa are transplanted to colder, or the white inhabitants of Europe to hotter climates, their children, born there, are of a different colour from themselves; that is, lighter in the first, and darker in the second instance.

As a proof of the first, we shall give the words of the Abbé Raynal, in his admired publication. “The children,” says he, “which they (the Africans) procreate in America, are not so black as their parents were. After each generation the difference becomes more palpable. It is possible, that after a numerous succession of generations, the men come from Africa would not be distinguished from those of the country into which they may have been transplanted.”

This circumstance we have had the pleasure of hearing confirmed by a variety of persons who have been witnesses of the fact; but particularly by many intelligent Africans, who have been parents themselves in America, and who have declared, that the difference is so palpable in the northern provinces, that not only they themselves have constantly observed it, but that they have heard it observed by others.

Neither is this variation in the children from the colour of the parents improbable. The children of the blackest Africans are born white. In this state

they continue for about a month, when they change to a pale yellow. In process of time they become brown. Their skin still continues to increase in darkness with their age, till it becomes of a dirty fallow black; and at length, after a certain period of years, glossy and shining. Now, if climate has any influence on the mucous substance of the body, this variation in the children from the colour of their parents is an event which must be reasonably expected; for being born white, and not having equally powerful causes to act upon them in colder, as their parents had in the hotter climates which they left, it must necessarily follow, that the same effect cannot possibly be produced.

Hence also, if the hypothesis be admitted, may be deduced the reason why even those children who have been brought from their country at an early age into colder regions, have been observed to be of a lighter colour than those who have remained at home till they arrived at a state of manhood. For having undergone some of the changes which we mentioned to have attended their countrymen from infancy to a certain age, and having been taken away before the rest could be completed, these farther changes, which would have taken place had they remained at home, seem either to have been checked in their progress, or weakened in their degree, by a colder climate.

We come now to the second and opposite case; for a proof of which we shall appeal to the words of Dr Mitchell in the Philosophical Transactions, N^o 476. sect. 4. “The Spaniards who have inhabited America under the torrid zone for any time, are become as dark coloured as our native Indians of Virginia, of which I myself have been a witness; and were they not to intermarry with the Europeans, but lead the same rude and barbarous lives with the Indians, it is very probable, that, in a succession of many generations, they would become as dark in complexion.”

To this instance we shall add one, which is mentioned by a late writer, who, describing the African coast and the European settlements there, has the following passage. “There are several other small Portuguese settlements, and one of some note at Mitomba, a river in Sierra Leone. The people here called *Portuguese* are principally persons bred from a mixture of the first Portuguese discoverers with the natives, and now become, in their complexion and woolly quality of their hair, perfect negroes, retaining, however, a smattering of the Portuguese language.”

These facts with respect to the colonists of the Europeans are of the highest importance in the present case, and deserve a serious attention. For when we know to a certainty from whom they are descended; when we know that they were, at the time of their transplantation, of the same colour as those from whom they severally sprung; and when, on the other hand, we are credibly informed that they have changed it for the native colour of the place which they now inhabit: the evidence in support of these facts is as great as if a person, on the removal of two or three families into another climate, had determined to ascertain the circumstance; as if he had gone with them and watched their children; as if he had communicated his observations at his death to a successor; as if his successor had prosecuted

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prosecuted the plan; and thus an uninterrupted chain of evidence had been kept up from their first removal to any determined period of succeeding time.

But though these facts seem sufficient of themselves to confirm our opinion, they are not the only facts which can be adduced in its support. It can be shown, that the members of the very same family, when divided from each other, and removed into different countries, have not only changed their family complexion, but that they have changed it to as many different colours as they have gone into different regions of the world. We cannot have, perhaps, a more striking instance of this than in the Jews. These people are scattered over the face of the whole earth. They have preserved themselves distinct from the rest of the world by their religion; and as they never intermarry with any but those of their own sect, so they have no mixture of blood in their veins that they should differ from each other; and yet nothing is more true, than that the English Jew is white, the Portuguese swarthy, the Armenian olive, and the Arabian copper; in short, that there appear to be as many different species of Jews as there are countries in which they reside.

To these facts we shall add the following observation, that if we can give credit to the ancient historians in general, a change from the darkest black to the purest white must have actually been accomplished. One instance, perhaps, may be thought sufficient. Herodotus relates, that the Colchi were black, and that they had crisped hair. These people were a detachment of the Æthiopian army under Sesostris, who followed him in his expedition, and settled in that part of the world where Colchis is usually represented to have been situated. Had not the same author informed us of this circumstance, we should have thought it strange that a people of this description should have been found in such a latitude. Now as they were undoubtedly settled there, and as they were neither so totally destroyed, nor made any such rapid conquests, as that history should notice the event, there is great reason to presume that their descendants continued in the same, or settled in the adjacent country; from whence it will follow, that they must have changed their complexion to that which is observed in the inhabitants of this particular region at the present day; or, in other words, that the black inhabitants of Colchis must have been changed into the fair Circassian. Suppose, without the knowledge of any historian, they had made such considerable conquests as to have settled themselves at the distance of 1000 miles in any one direction from Colchis, still they must have changed their colour: For had they gone in an eastern or western direction, they must have been of the same colour as the Circassians; if to the north, whiter; if to the south, of a copper colour. There are no people within that distance of Colchis who are black.

From the whole of the preceding observations on the subject, we may conclude, that as all the inhabitants of the earth cannot be otherwise than the children of the same parents, and as the difference of their appearance must have of course proceeded from incidental causes, these causes are a combination of those qualities which we call *climate*: that the blackness of the Africans is so far engrafted in their constitution, in a course of many generations, that their chil-

dren wholly inherit it, if brought up in the same spot; but that it is not so wholly interwoven in their nature, that it cannot be removed if they are born and settled in another.

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The same principles with the above we find adopted and further illustrated by Professor Zimmerman of Brunswick, in his celebrated work *The Geographical History of Man, &c.* He there proves in the most satisfactory manner, That the complexion of the human species is uniformly correspondent with the degree of heat or cold to which they are habitually exposed. In maintaining this position, he makes a very proper distinction with regard to climate. By *climates* we are to understand, not simply or solely those distinguished by the geographical divisions of the globe, to the exclusion of what he terms *physical climate*, or that which depends on the changes produced in any given latitude by such adventitious circumstances as the lower or more elevated situations of a country, its being encompassed by water or large tracts of land, overspread or surrounded with forests, placed in an extensive plain, or environed by lofty mountains. Peculiarities of the like kind, as has been already noticed, frequently prevent the *physical climate* from corresponding entirely with the *geographical*, as a country influenced by them is often much warmer or colder than other regions placed under the same degree of latitude. The influence of these secondary or modifying circumstances has been already adverted to, and need not be further enlarged upon: we shall here only observe, that the erroneous reasoning of Lord Kames on this subject seems to have been owing to this inattention to the difference above mentioned. At Senegal, and in the adjacent lands, the thermometer is often at 112 or 117 degrees in the shade; and here we find the inhabitants jet black, with woolly hair. The heat is equally great in Congo and Loango, and these countries are inhabited by negroes only; whereas in Morocco, to the north of these regions, and at the Cape of Good Hope, to the south, the heat is not so intense, nor are the inhabitants of so deep a hue. Lord Kames asks, Wherefore are not the Abyssinians and the inhabitants of Zaara of as dark a complexion as the Moors on the coast of Guinea? M. Zimmerman answers, that "these countries are much cooler. The desert is not only farther from the equator, but the winds blowing over the Atlas mountains, which like the Alps are covered with snow, and the westerly wind coming from the sea, must considerably mitigate the heat. Nor is Abyssinia so warm as either Monomotapa or Guinea. The north-east winds from the side of Persia and Arabia are cooled by their passage over the Red Sea: the northern winds from Egypt lose much of their heat on the chain of mountains that is extended between the countries; the winds from the south and the west are sea-winds. Thus, the only quarter from which they can derive excessive heat is from the west, as the air on this side must pass over tracts of heated lands." For a similar reason it is that negroes are not found either in Asia or South America under the equator. The situations of these countries, our author observes, expose them to sea-breezes and cooling winds from the continent. He confirms this hypothesis by observing, that the mountaineers of warm climates, as in Barbary and Ceylon, are much fairer than the inhabitants of the valleys: that

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that the Saracens and Moors, who conquered the north-east part of Africa in 1700, from being brown, are become like the negroes near the equator: that the Portuguese, who settled at Senegal in 1400, became blacks; and Tudela the Jew asserts, that his countrymen in Abyssinia acquired the dark complexion of the original natives.

Upon the whole: Colour and figure may be styled habits of the body. Like other habits, they are created, not by great and sudden impressions, but by continual and almost imperceptible touches. Of habits both of mind and body, nations are susceptible as well as individuals. They are transmitted to offspring, and augmented by inheritance. Long in growing to maturity, national features, like national manners, become fixed only after a succession of ages. They become, however, fixed at last; and if we can ascertain any effect produced by a given state of weather or of climate, it requires only repetition during a sufficient length of time to augment and impress it with a permanent character. The sanguine countenance will, for this reason, be perpetual in the highest latitudes of the temperate zone; and we shall for ever find the swarthy, the olive, the tawny, and the black, as we descend to the south.

The uniformity of the effect in the same climate, and on men in a similar state of society, proves the power and certainty of the cause. If the advocates of different human species suppose that the beneficent Deity hath created the inhabitants of the earth of different colours, because these colours are best adapted to their respective zones; it surely places his benevolence in a more advantageous light to say, he has given to human nature the power of accommodating itself to every zone. This pliancy of nature is favourable to the union of the most distant nations, and facilitates the acquisition and the extension of science, which would otherwise be confined to few objects and to a very limited range. It opens the way particularly to the knowledge of the globe which we inhabit; a subject so important and interesting to man. It is verified by experience. Mankind are for ever changing their habitations by conquests or by commerce; and we find them in all climates, not only able to endure the change, but so assimilated by time, that we cannot say with certainty whose ancestor was the native of the clime, and whose the intruding foreigner.

All the foregoing observations have been well recapitulated, illustrated by new facts, and enforced by additional reasoning founded on experience, by the Reverend Dr S. S. Smith, professor of moral philosophy in the college of New Jersey, in his *Essay on the Causes of the variety of Complexion and Figure in the Human species*; to which the reader who wishes for further satisfaction on the subject is referred.

COMPLEXUS; and *COMPLEXUS Minor*, or *Trachelo-mastoidæus*; two muscles in the posterior part of the trunk. See ANATOMY, *Table of the Muscles*.

COMPLICATION, in general, denotes the blending, or rather interweaving, of several different things together: thus, a person afflicted with several disorders at the same time, is said to labour under a complication of disorders.

COMPLINE, the last division of the Romish breviary. It was instituted to implore God's protection
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during the night, as the *prime* is for the day. It is recited after sunset; and is so called, because it completes the office for the 34 hours.

COMPLUTENSIAN BIBLE. See BIBLE (*Greek*.)

COMPONE, or COMPONED, or *Gobony*, in Heraldry. A bordure compone is that formed or composed of a row of angular parts, or chequers of two colours.

COMPONED, or COMPOSED, is also used in general for a bordure, a pale, or a fess, composed of two different colours or metals disposed alternately, separated and divided by fillets, excepting at the corners; where the junctures are made in form of a goat's foot.

COMPOSITE, in general, denotes something compounded, or made up of several others united together; thus,

COMPOSITE Numbers, are such as can be measured exactly by a number exceeding unity; as 6 by 2 or 3, or 10 by 5, &c. so that 4 is the lowest composite number. Composite numbers, between themselves, are those which have some common measure besides unity; as 12 and 15, as being both measured by 3.

COMPOSITE Order, in *Architecture*, the last of the five orders of columns; so called because its capital is composed out of those of the other columns, borrowing a quarter round from the Tuscan and Doric, a row of leaves from the Corinthian, and volutes from the Ionic. Its cornice has simple modillions, or dentils. It is also called the *Roman* or *Italic* order, as having been invented by the Romans. By most authors it is ranked after the Corinthian, either as being the next richest, or the last invented. See ARCHITECTURE, N^o 48.

COMPOSITION, in a general sense, the uniting or putting together several things, so as to form one whole, called a *compound*.

COMPOSITION of Ideas, an act of the mind, whereby it unites several simple ideas into one conception or complex idea.

When we are provided with a sufficient stock of simple ideas, and have by habit and use rendered them familiar to our minds, they become the component parts of other ideas still more complicated, and form what we may call a second order of compound notions. This process may be continued to any degree of composition we please, mounting from one stage to another, and enlarging the number of combinations.

COMPOSITION, in *Grammar*, the joining of two words together; or prefixing a particle to another word, to augment, diminish, or change its signification.

COMPOSITION, in *Logic*, a method of reasoning whereby we proceed from some general self-evident truth to other particular and singular ones.

In disposing and putting together our thoughts, there are two ways of proceeding equally within our choice; for we may so suppose the truths, relating to any part of knowledge, as they presented themselves to the mind in the manner of investigation: carrying on the series of proofs in a reverse order, till they at last terminate in first principles: or beginning with these principles, we may take the contrary way; and from them deduce, by a direct train of reasoning, all the several propositions we want to establish.

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thoughts gives rise to the twofold division of method established among logicians; the one called *analytic* method, or the method of *resolution*, inasmuch as it traces things back to their source, and resolves knowledge into its first and original principles. This method stands in contradistinction to the method of composition; or, as it is otherwise called, the *synthetic* method; for here we proceed by gathering together the several scattered parts of knowledge, and combining them into one system, in such a manner as that the understanding is enabled distinctly to follow truth through all the different stages of gradation.

COMPOSITION, in *Music*, is the art of inventing and writing airs; of accompanying them with a suitable harmony; in short, of forming a complete piece of music in all its parts.

The knowledge of melody, harmony, and its rules, is the foundation of composition. Without doubt, it is necessary to know in what manner chords should be filled, how to prepare and resolve dissonances, how to find the fundamental bass, and how to put in practice all the other minutiae of elementary knowledge; but with the mechanical rules of harmony alone, one is by no means better qualified to understand the art, and operate in the practice of composition, than to form himself for eloquence upon all the rhetorical precepts exhibited in grammar. We need not say, that besides this, it is necessary to understand the genius and compass of voices and instruments; to judge what airs may be of easy, and what of difficult, execution; to observe what will, and what will not, be productive of any effect; to feel the character of different movements, as well as that of different modulations, that both may be always suitably applied; to know the different rules established by convention, by taste, by caprice, or by pedantry, as fugues, imitations, or in pieces where the subject is confined to uniform laws in its harmony, melody, rythmus, &c. All these acquisitions are still no more than preparatives for composition: but the composer must find in his own genius the sources of beautiful melody, of sublime harmony, the picturesque, and the expressive in music; he must, in short, be capable of perceiving, and of forming, the order of the whole piece; to follow the relations and aptitudes of which it is susceptible in every kind; to inflame his soul with the spirit and enthusiasm of the poet, rather than childishly amuse himself with punning in harmony, or adapting the music to each particular word. It is with reason that our musicians have given the name of *words* to the poems which they set to music. It appears evident from their manner of expressing them, that, in their apprehension, they seemed words, and words alone. One would be tempted to imagine, particularly during some of these last years, that the rules for the formation and succession of chords have caused all the rest to be neglected or forgotten; and that harmony has made no acquisitions but at the expence of what is general and essential in the musical art. All our artists know how to fill a chord with its constituent sounds, or a piece of harmony with its constituent parts; but not a soul amongst them feels a ray of composition. As to what remains, though the fundamental rules of counterpoint, or music in parts, continues still the same, they are more or less rigorous and inflexible in proportion as the parts increase in num-

ber; for according as the parts are multiplied, the difficulty of composition is heightened, and the rules are less severe. Compositions in two parts are called *duettos* when the two performers sing equally; that is to say, when the subject is no further extended, but divided between them: but if the subject is in one part alone, and the subordinate harmony no more than an accompaniment, the first part is then either called a *recitative* or a *solo*; and the other an *accompaniment*, or *continued bass*, if it is a bass. It is the same case with the *trio*, with compositions in three, in four, or in five parts.

The name of *composition* is likewise given to such pieces of music themselves as are formed according to the rules of the art. For this reason the *duettis*, *trios*, *quartettos*, which have just been mentioned, are called *compositions*.

Compositions are either formed for the voice alone, or for instruments, or for voices and instruments joined. Full choruses and songs are the only compositions principally intended for the voice, though sometimes instruments are joined with it to support it. Compositions for instruments are intended to be executed by a band in the orchestra, and then they are called *symphonies*, *concertos*; or for some particular species of instruments, and then they are called *pieces* or *sonatas*.

Such compositions as are destined both for voices and instruments, have been generally divided into two capital species, viz. the *sacred* and the *secular*. The compositions destined for the church, whether psalms, hymns, anthems, or responsives, are in general distinguished by the name of *church-music*, and characterized by their intention to be sung with words. Secular music in general may likewise be divided into two kinds; *theatrical* and *chamber* music. Of the first kind is that used in the operas; the subdivisions of the second are endless. Solos, concertos, cantatas, songs, and airs, almost of every kind, which are not adapted to the church or the stage, may be included in the idea of *chamber-music*.

In general, it is thought, that sacred music requires deeper science, and a more accurate observation of rules; the secular species gives more indulgence to genius and subsists in greater variety.

But we must here observe, that the ecclesiastical music now used, or rather profaned and murdered, amongst us, though regular in its harmony, is simple in its composition, and demands not that profound knowledge in the art, either to form or comprehend it, which Rousseau, whom till now we have followed in this article, seems to imagine. His assertion can only be applicable to the church-music of Italy. That which is now established amongst us seems not to be indigenous, but transferred with the Calvinistical liturgy from Geneva; and as it is intended for popular use, it can by no means be esteemed a high exertion of the musical art; yet, however simple, it is pleasing; and, when properly performed, might elevate the soul to a degree of devotion, and even of rapture, which at present we are so far from feeling, that we rather seem to sleep or to howl, than to sing the praise of God. Perhaps our clergy may find more advantage in cultivating their farms; but they would surely feel a higher and diviner pleasure in cultivating the tastes and voices.

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voices of their people. The one, however, is not incompatible with the other. An hour of relaxation in a winter evening might serve for the accomplishment of this pious purpose; and one should imagine, that, independent of religious considerations, the spirit of the craft might dictate such a measure as calculated to produce popular entertainment and gain popular affection.

In composition, the author either confines himself, as a subject, to the mere mechanical modulations and arrangements of sound; and, as his end, to the pleasure of the ear alone; or otherwise he soars a nobler height; he aspires to imitative music; he endeavours to render the hearts and souls of his auditors ductile by his art, and thus to produce the noblest emotions and most salutary effects. In the first view, it is only necessary that he should look for beautiful sounds and agreeable chords; but in the second he ought to consider music in its conformity with the accents of the human voice, and in the expressive powers of notes harmonically combined to signify or paint such objects as are susceptible of imitation. In Rousseau's article *opera*, some ideas may be found by which the art may be ennobled and elevated, by forming music into a language more powerful and pathetic than eloquence itself. See *OPERA*.

COMPOSITION, in literature, the art of forming and arranging sentiments, and clothing them with language suitable to the nature of the subject or discourse. See the articles *LANGUAGE*, *ORATORY*, *POETRY*, *DIALOGUE*, *EPISTLE*, and *HISTORY*.

COMPOSITION, in *Chemistry*, is the union and combination of several substances of different natures, from which a compound body results. From this union of bodies of different natures, a body is formed, of a mixed nature, which Becker and Stahl have called a *mixture*, and which may be called a *combination*, or *chemical composition*, to avoid the equivocal sense of the word *mixture*. By this last, we understand only a mere apposition of parts; and which would therefore give a very false idea of chemical composition, in which a mutual adhesion takes place between the combined substances.

COMPOSITION, in *Painting*, includes the invention as well as disposition of the figures, the choice of attitudes, &c.

Composition, therefore, consists of two parts; one of which finds out, by means of history, proper objects for a picture; and the other disposes them to advantage. See *PAINTING*.

COMPOSITION, in *Pharmacy*, the art or act of mixing divers ingredients together into a medicine, so as they may assist each other's virtues, supply each other's defects, or correct any ill qualities thereof. See *PHARMACY*.

COMPOSITION, in *Commerce*, a contract between an insolvent debtor and his creditors, whereby the latter accept of a part of the debt in composition for the whole, and give a general acquittance accordingly.

COMPOSITION, in *Printing*, commonly termed *compositing*, the arranging of several types or letters in the composing-stick, in order to form a line; and of several lines ranged in order, in the galley, to make a

page; and of several pages to make a form. See *Compositæ* *PRINTING*.

COMPOSITÆ, in *Botany*. The name of a class in Hermannus and Royen; as likewise of an order in Linnæus's fragments of a natural method, consisting in general of the plants which have the characters enumerated in the following article. A particular description of this order is given under the article *SYNGENESIA*, which includes all the compound flowers.

COMPOSITUS FLOS, in *Botany*, an aggregate flower, composed of many *flosculi sessiles*, on a common entire receptaculum, with a common perianthium, and whose antheræ being five in number unite in the form of a cylinder; the flosculi are monopetalous, and under each of them is a monospermous germen. Compound flowers are either *ligulati*, *tubulosi*, or *radiati*.

COMPOST, in *Agriculture*, denotes a certain kind of mixture designed to assist the soil in the way of vegetation, instead of dung. The requisites for a compost are, 1. That it ought to be cheaper than the quantity of dung required for an equal extent of soil. 2. It ought to be less bulky; and, 3. It ought to produce equal effects.

Under the article *AGRICULTURE*, we have endeavoured to show, that the true vegetable food consists in reality of the putrid effluvia proceeding from decayed animal and vegetable substances. If this theory is admitted, the hope of making compost as a succedaneum for dung is but very small, unless they are made of putrefied animal and vegetable substances; in which case, unless in very singular circumstances, they will prove much dearer than dung itself. Several attempts, however, have been made by those who had other views concerning the nature of the true vegetable food. An oil compost is recommended in the *Georgical Essays*, upon a supposition that the food of vegetables is of an oily nature. It is made as follows: "Take of North American potash 12 lb. Break the salt into small pieces, and put it into a convenient vessel with four gallons of water. Let the mixture stand 48 hours: then add coarse train oil 14 gallons. In a few days the salt will be dissolved, and the mixture, upon stirring, will become nearly uniform. Take 14 bushels of sand, or 20 of dry mould: upon these pour the above liquid ingredients. Turn this composition frequently over, and in six months it will be fit for use. When the liquid ingredients are put to one or two hogheads of water, a liquid compost will be formed, which must be used with a water cart."

This compost, however, the inventor himself owns to be inferior to rotten dung, as indeed may very naturally be supposed; yet in some cases it seems capable of doing service, as will appear from some of the following experiments which we extract from the essays above mentioned.

Exp. I. By the author of the essays. "I took four pots, N^o 1, 2, 3, 4. N^o 1. contained 12 lb. of barren sand, with 1 oz. of the sand oil-compost. N^o 2. contained 12 lb. of sand without any mixture. N^o 3. had 12 lb. of sand with half an ounce of flaked lime. N^o 4. had 12 lb. of sand with 4 oz. of the sand oil-compost. In the month of March I put six grains of wheat into each pot, and during the summer, I occasionally

Compost.

watered the plants with filtrated water. All the time the plants were confuming the farina, I could observe very little difference in their appearance. But after one month's growth, I remarked that N^o 1. was the best; N^o 2. the next; N^o 3. the next; and N^o 4. much the worst." The same differences were observed in August, when N^o 1. the best, had five small ears, which contained a few poor grains of wheat.

Exp. II. By the same. "In the month of June, I selected four lands of equal goodness in a field intended for turnips. The soil was a light sand, with a tolerable quantity of vegetable earth amongst it. It was ploughed out of sward in November, and had not borne a crop for many years. I shall distinguish my experimental lands by N^o 1, 2, 3, 4. N^o 1. was manured with rotten dung; N^o 2. with oil-compost; N^o 3. with lime; N^o 4. was left without any dressing. On the 20th of June they were all sown with turnip-feed broadcast, and during the course of the season were twice hoed. In November I viewed the field, and made the following remarks. N^o 1. the best; N^o 2. the next; N^o 3. the worst; N^o 4. better than N^o 3." Here the oil-compost appears in a favourable light; but other trials, made with equal accuracy, seem rather to prove, that it is not proper for turnips, barley, or quick-growing vegetables. It requires being meliorated by the atmosphere, and therefore is better adapted for winter crops.

Exp. III. By the same. "In the month of May, I planted 12 alleys that lay between my asparagus beds with cauliflower plants. Each alley took up about 30 plants. One of the alleys I set apart for an experiment with the oil-compost, prepared according to the directions already given. About an handful of the compost was put to the root of each cauliflower plant. In all other respects the alley was managed like the rest. The plants in general flowered very well; but those to which I applied the compost sprung up hastily with small stalks, and produced very poor flowers. I imputed this unfavourable appearance to the freshness of the compost, which was only a few weeks old. In the September following this unsuccessful experiment, I planted the same alleys with early cabbages. The necessity of meliorating the compost was in this trial fully confirmed. For the cabbages that grew upon the alley, which in May had received the compost, were larger and in all respects finer than the others."

Exp. IV. by James Stovin, Esq. of Doncaster. "In the year, 1769, I made the following trial with the oil-compost, prepared as above directed. One acre sown with barley and manured with oil-compost at 18s. produced five quarters five bushels. An acre adjoining, sown with barley, and manured with 12 loads of rotten dung at 3l. produced four quarters three bushels and two pecks. The compost-barley was bolder and better corn than the other. In the year 1770, the dunged acre produced of rye, three quarters. The compost acre of ditto, two quarters six bushels. In the year 1771, the same lands were sown with oats, and the produce was greatly in favour of the dunged acre. These experimental lands were in a common field that had been long under the plough."

Exp. V. by Richard Townley, Esq; of Belfield.

Compost.

"In the spring 1770, I prepared a piece of ground for onions. It was laid out into six beds of the same size, and which were all sown at the same time. Over two of them, the oil-compost was scattered in a very moderate quantity. Over other two, pigeons dung: and over the remaining two, some of my *weed-compost* (formed of putrefied vegetables), which I esteem one of the best manures, for most vegetables, that can be made. The onions came up very well in all the beds; but in about six weeks, those that were fed with the oil-compost, plainly discovered the advantage they had over the rest by their luxuriancy and colour, and at the end of the summer perfected the finest crop I had ever seen, being greatly superior to the others both in quantity and size. The same spring I made an experiment upon four rows of cabbages, set at the distance of four feet every way. Two were manured with oil-compost, and two with my own. All the plants were unluckily damaged, just before they began to form, by some turkeys getting into the field and plucking off the greatest part of the leaves. However, they so far recovered, in the September following, from 22 to 28lb. a-piece. The rows proved so equal in goodness, that I could not determine which had the advantage. The same year, one part of a field of wheat exposed to the north-east winds, which that spring, continued to blow for a month or five weeks, appeared very poor and languid at the time of tillering. Over it I ordered some of the oil-compost to be sown with the hand; which not only recovered, but also pushed forwards the wheat plants in that part of the field, so as to make them little inferior, if any, to the rest. The same spring, I made a comparative experiment, upon four contiguous lands of oats, between the oil-compost and my own weed-compost. The latter had manifestly the advantage, though the other produced a very large and fine crop. I also tried the oil-compost upon carrots, and it answered exceedingly well. I did the same this year (1771) both upon them and my onions, and have the finest crops of these vegetables I ever saw anywhere upon the same compass of ground."

Exp. VI. by Mr J. Broadbent of Berwick, in Elmet near Leeds.—"On the first of October 1771, I sowed two acres of a light channelly soil with wheat, and harrowed in the compost with the grain. Being at a considerable distance from a large town, we find it very difficult and expensive to procure rotten dung in sufficient quantity for our tillage lands, for which reason we have recourse to land-dressings both for our winter and spring corn. Rape-dust and foot are principally used; but the present price of both these articles is a heavy tax upon the farmer. To obviate that inconvenience, I resolved to make trial of the oil-compost; and from what I have observed in this one experiment, I am encouraged to make a more extensive use of it the next year. Being well acquainted with the nature and efficacy of foot, I am satisfied, that the above two acres produced as good a crop of wheat as if they had been dressed with that excellent manure."

On the supposition that vegetables are supported by matters of a saline nature, composts formed of different sorts of fals have been contrived, but with less success than the one above treated of. A famous composition

Compost. position of this kind was lately sold by patent, under the name of *Baron Van Haak's Compost*. The following experiment is mentioned in the *Georgical Essays*, as made with a view to determine the virtues of it compared with the oil-compost and foot mixed with ashes.—“ In the beginning of April 1773, an acre of land was sown with early oats. I pitched upon one land in the middle of the piece, which I esteemed better than any of the rest, and upon this I scattered Baron Van Haak's compost, in the quantity directed in his instructions. On one side I manured a land with the oil-compost, but rather with a less quantity than directed; and on the other side, I manured two lands with dry coal-ashes sifted fine, and an equal quantity of foot. The lands upon which this experiment was made, were much worn out with a long succession of crops. The lands which had the benefit of the ashes and foot, produced an exceeding fine crop; the oil-compost produced a tolerable good one; but that which had only the assistance of the baron's compost, produced a very poor one. It could not have been worse had it been left destitute of every assistance.”

Composts, made with putrefied animal substances will no doubt answer much better, in most cases, than any other kind of manure, but they are difficult to be procured. The following is recommended to Dr Hunter of York.—“ Take a sufficient quantity of sawdust, incorporate it with the blood and offal of a slaughter-house, putting a layer of one and a layer of the other till the whole becomes a moist and fetid composition. Two loads of this compost, mixed with three loads of earth, will be sufficient for an acre of wheat or spring-corn. Being a kind of top-dressing, it should be put on at the time of sowing, and harrowed in with the grain. The present year I have a field of wheat manured in this manner, and have the pleasure to say, that it is extremely clean, and has all the appearance of turning out an excellent crop. As this kind of compost lies in a small compass, it seems well adapted for the use of such farmers as are obliged to bring their manures from a distance. It is besides extremely rich, and will probably continue in the land much longer than fold-yard or stable-dung. I apprehend that it is capable of restoring worn-out land to its original freshness; and I am induced to be of that opinion, from the appearance of the above crop, which is now growing upon land much impoverished by bad management.”

Another compost, prepared from whales flesh, is recommended by Mr Charles Chaloner.—“ I have a particular pleasure (says he) in describing and making public the best method of forming a compost from whales flesh, as recommended to me by Dr Hunter. Having marked out the length and breadth of your intended dung-hill, make the first layer of earth about a foot in thickness. Moor-earth, or such as is taken from ant-hills, is the best for this purpose. Over the earth lay one layer of long litter, from the fold-yard or stable, about 12 inches in thickness, then a layer of whale-flesh, and over that another layer of dung. Repeat the operations till the heap be raised about six feet, then give it a thick covering of earth, and coat the heap with sods. In this manner each layer of flesh will be placed between two layers of

dung. In about a month turn the whole in the usual manner, which will occasion a strong degree of heat and fermentation. When turned, coat with earth as before, with a view to confine the putrid steam which would otherwise escape. In a month or two the heap will be found to be considerably fallen, when it should have a second turning as before. The operation of turning must be repeated at proper intervals, till the whole becomes an uniformly putrid mass. The whale-flesh is of different degrees of firmness, some of it being almost liquid; and, in proportion to its firmness, the heap will become sooner or later fit for use. In general, the compost should not be used till 12 months old; but that depends upon circumstances. Guard the heap from dogs, pigs, badgers, and vermin, as these animals are remarkably fond of whale-flesh. This animal compost may with great advantage be applied to all purposes where good rotten dung is required. I have used it with great success for cabbages, and find it an excellent dressing for meadow-ground. According to the best computation, one hoghead of whale refuse, will make eight loads of dung; which when we consider the great facility with which this basis of our dung-hill may be carried, is a momentous concern to such farmers as lie remote from a large town.” See MANURE.

COMPOST, in gardening, is a mixture of several earths, earthy substances, and dungs, either for the improvement of the general soil of a garden, or for that of some particular plants. Almost every plant delights in some peculiar mixture of soils or compost, in which it will thrive better than in others. The most remarkable and generally useful of these, are taken notice of under the description of the several botanical articles, as they occur in the order of the alphabet.

COMPOSTELLA, a celebrated town of Spain, and capital of Galicia, with an archbishop's see, and an university. The public squares, and the churches, particularly the metropolitan church, are very magnificent. It has a great number of monasteries, for both sexes, and about 2000 houses. It is pretended that the body of St James was buried here, which draws a great number of pilgrims from most parts of Christendom. They walk in procession to the church, and visit his wooden image, which stands on the great altar, and is illuminated with 40 or 50 wax-candles. They kiss it three times with a very respectful devotion, and then put their hats on its head. In the church there are 30 silver lamps always lighted, and six chandeliers of silver, five feet high. The poor pilgrims are received into an hospital, built for that purpose, which stands near the church; and round it are galleries of free-stone, supported by large pillars. The archbishop is one of the richest prelates in Spain, having 70,000 crowns a-year. From this town the military order of St Jago, or St James, had its original. It is seated in a peninsula, formed by the rivers Tambrá and Ulla, in a pleasant plain, 265 miles north-west of Madrid. W. Long. 8. 17. N. Lat. 42. 52.

NEW COMPOSTELLA, a town of North America, in New Spain, and province of Xalisco, built in 1531. It is seated near the South sea. W. Long. 109. 42. N. Lat. 21. 20.

COMPOUND, in a general sense, an appellation given

Compound given to whatever is composed or made up of different things; thus we say, a compound word, compound sound, compound taste, &c.—*Compound* differs from *complex*, and stands opposed to *simple*. See COMPLEX and SIMPLE.

COMPOUND Flower. See *COMPOSITUS Flos*.

COMPOUND Interest, called also *interest upon interest*, is that which is reckoned not only upon the principal, but upon the interest itself forborne; which hereby becomes a sort of secondary principal. See INTEREST.

COMPOUND Motion, that motion which is effected by several conspiring powers. Powers are said to conspire if the direction of the one be not quite opposite to that of the other, as when the radius of a circle is conceived to revolve about a centre, and at the same time a point to move straight along it.

COMPOUND Numbers, those which may be divided by some other number besides unity, without leaving any remainder; such are 18, 20, &c. the first being measured by the numbers 2, 6, 9; and the second by the numbers 2, 4, 5, 10.

COMPOUND Quantities. See ALGEBRA.

COMPOUND Ratio, is that which the product of the antecedents of two or more ratios has to the product of their consequents. Thus, 6 to 72 is in a ratio compounded of 2 to 6, and of 3 to 12.

COMPOUND (substantive), the result or effect of a composition of different things; or a mass formed by the union of many ingredients.

COMPREHENSION, in English church-history, denotes a scheme proposed by Sir Orlando Bridgman in 1667-8, for relaxing the terms of conformity in behalf of Protestant dissenters, and admitting them into the communion of the church. A bill for this purpose was drawn up by Lord Chief-Baron Hale, but disallowed. The attempt was renewed by Tillotson and Stillingfleet in 1674, and the terms were settled to the satisfaction of the nonconformists; but the bishops refused their assent. This sentence was likewise revived again immediately after the Revolution; the king and queen expressed their desire of an union; however, the design failed after two attempts; and the act of toleration was obtained.

COMPREHENSION, in *Metaphysics*, is that act of the mind whereby it apprehends or knows any object that is presented to it, on all the sides whereon it is capable of being apprehended or known. To comprehend a thing is defined by the schoolmen, *rem aliquam totam et totaliter cognoscere*.

COMPREHENSION, in *Rhetoric*, a trope or figure whereby the name of a whole is put for a part; or that of a part for a whole; or a definite number of any thing for an indefinite.

COMPRESS, in *Surgery*, a bolster of soft linen cloth, folded in several doubles, frequently applied to cover a plaster, in order not only to preserve the part from the external air, but also the better to retain the dressings or medicines.

COMPRESSION, the act of pressing or squeezing some matter together, so as to set its parts nearer to each other, and make it possess less space. *Compression* properly differs from *condensation*, in that the latter is performed by the action of cold, the former by some external violence.

COMPROMISE, a treaty or contract, whereby two contending parties establish one or more arbitrators to judge of and terminate their difference in an amicable manner.

COMPTON, HENRY, bishop of London, was the youngest son of Spencer earl of Northampton, and born in 1632. After the restoration of Charles II. he became cornet of a regiment of horse; but soon after quitting the army for the church, he was made bishop of Oxford in 1674; and about a year after translated to the see of London. He was entrusted with the education of the two princesses Mary and Anne, whom he also afterwards married to the princes of Orange and Denmark; and their firmness in the Protestant religion was in a great measure owing to their tutor, to whom when Popery began to prevail at court, it was imputed as an unpardonable crime. He was suspended from his ecclesiastical function by James II. but was restored by him again on the prince of Orange's invasion. He and the bishop of Bristol made the majority for filling the vacant throne with a king: he performed the ceremony of the coronation; was appointed one of the commissioners for raising the liturgy; and laboured with much zeal to reconcile dissenters to the church. His spirit of moderation made him unpopular with the clergy, and in all probability checked his further promotion. He died in 1713; but living in busy times, did not leave many writings behind him.

COMPTROLLER. See CONTROLLER.

COMPULSOR, an officer under the Roman emperors despatched from court into the provinces, to compel the payment of taxes, &c. not paid within the time prescribed. The word is formed of the verb *compellere*, "to oblige, constrain." These were charged with so many exactions, under colour of their office, that Honorius cashiered them by a law in 412.

The laws of the Visigoths mention military compulsors; which were officers among the Goths, whose business was to oblige the tardy soldiers to go into the fight, or to run to an attack, &c.

Cassian mentions a kind of monastic compulsors, whose business was to declare the hours of canonical office, and to take care the monks went to church at those hours.

COMPUNCTION, in *Theology*, an inward grief in the mind for having offended God. The word comes from *compungere*, of *pungere*, "to prick."—The Romanists own their confession insignificant unless attended with compunction or pricking of heart.

Among spiritualists, compunction bears a more extensive signification; and implies not only a grief for having offended God, but also a pious sensation of grief, sorrow, and displeasure, on other motives.—Thus, the miseries of life, the danger of being lost in the world, the blindness of the wicked, &c. are to pious people motives of compunction.

COMPURGATOR, one that, by oath, justifies another person's innocence. Compurgators were introduced as evidences in the jurisprudence of the middle ages. Their number varied according to the importance of the subject in dispute, or the nature of the crime with which a person was charged.

COMPUTATION, in a general sense, the manner

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ner of estimating time, weights, measure, moneys, or quantities of any kind.—The word is sometimes also used among mathematicians in the like sense as calculation.

COMUM, in *Ancient Geography*, a town of the Orobii, of an ancient standing, and formerly powerful, daring to dispute with the Romans: *Comenses*, the people; *Comensis Ager*, the epithet. It became afterwards no inconsiderable municipium, to which Julius Cæsar added 5000 new colonists (Strabo); whence it was generally called *Novocomum*, and the people *Novocomenses*. But in time it recovered its ancient name, *Comum*; Pliny the younger, a native of that place, calling it by no other name. Now *Como*, in the duchy of Milan, at the south end of the lake of that name. E. Long. 9. 37. N. Lat. 46. It is about 80 miles N. E. of Turin.

COMUS, in *Mythology*, the god of jollity or festivity. There is great reason to believe he was the Chamos of the Moabites; Beel-Phegor, Baal-Peor, Priapus, and Bacchus. He is represented under the appearance of a young man, with an inflamed red countenance, his head inclined, and crowned with flowers; his air drowsy; leaning on a huntsman's spear in his left hand, and holding an inverted torch in his right. His statue was placed at the chamber doors of new married persons; his pedestal crowned with flowers.

CON, or COND. See COND.

CONANT, DR JOHN, a learned English divine, born in 1608. He took his degrees at Exeter College Oxford; was, by the parliament, constituted one of the assembly of divines, though he seldom, if ever, sat with them; and in 1657 was admitted vice-chancellor of the university. On the restoration he was one of the commissioners, and assisted at the conferences in the Savoy; but was deprived by the act of uniformity; after eight years he was confirmed, and was made archdeacon of Norwich, and prebendary of Worcester. In 1686 he lost his sight; and died in 1693; leaving a number of admired sermons, afterwards published in six volumes.

CONARION, or CONOIDES, a name for the pineal gland. See ANATOMY *Index*.

CONATUS, a term frequently used in philosophy and mathematics, defined by some to be a quantity of motion, not capable of being expressed by any time or length; as the *conatus recedendi ab axe motus*, is the endeavour which a body, moved circularly, makes to recede, or fly off from the centre or axis of its motion.

CONCA, SEBASTIAN, called *Cavalier*, a celebrated history and portrait painter, was born at Gaeta in 1679, and placed as a disciple with Francesco Solimena, an incomparable master. Under his direction Conca exerted his utmost industry to obtain a proper knowledge of the true principles of the art of painting; nor did he permit any kind of amusement to withdraw his attention from his studies. Solimena soon perceived in his disciple such talents, and such a disposition, as would qualify him to make a very great progress; and on that account he conceived so strong an affection for him, that he not only afforded him the best instructions, but often employed him to sketch after his own designs; took him along with him to

Monte Cassino, where he was to paint a chapel in fresco; and there made Conca acquainted with every thing relative to that manner of painting. At his return to Naples with Solimena, he was, if possible, still more assiduous to improve himself to the utmost; and entered on a project that might at once advance his income, and add to his expertness in his profession. That project was, to paint portraits in a small size and at a low rate; by which scheme all ranks of persons crowded to him; and beside the pecuniary advantages resulting from it, he acquired an extraordinary freedom of hand in penciling and colouring; a good habit of imitating nature with an elegant choice; and likewise great diversity of airs of heads, which were of extraordinary use to him in his future beautiful compositions. As he had a great desire to see Rome, he obtained permission from Solimena to indulge his inclination; and although he was near thirty years of age when he visited that city, yet he spent eight years in constant study after the antiques, after Buonaroti, Raphael, and the Carracci, and perfected himself in every part of his profession. The fame of his works soon spread throughout Rome, and procured him the patronage of Cardinal Ottobuoni, who was a princely encourager of artists; and Conca having shown an elegant proof of his abilities in a composition representing Herod inquiring of the wise men the place of the birth of the Messiah, the figures being as large as life, the Cardinal thought it so excellent a performance, that he rewarded him in a munificent manner, entertained him in his own palace, and introduced him to Pope Clement XI. who appointed Conca to paint the picture of the prophet Jeremiah in the church of St John Lateran; which he executed with universal applause. On that occasion the pope was desirous to give him some particular mark of his esteem; and therefore, in a general assembly of the academicians of St Luke, he conferred on him the order of knighthood, and the cardinal presented him with a rich diamond cross, which Conca, out of respect to his patron, always wore at his bosom. From that time he was incessantly employed, and his works were solicited by most of the princes of Europe. The churches and chapels of every part of Italy are enriched with some of his compositions; of which he painted an incredible number, as he lived to a very advanced age, and never discontinued his labours. He was earnestly invited by Philip V. of Spain to visit his court, but he could not be prevailed on to leave Rome. He painted two admirable pieces for the king of Poland, with figures as large as life; in one was represented Alexander presenting Bucephalus to Philip, after he had managed him; a grand composition, with a multitude of figures, correctly designed, and charmingly grouped and disposed; the whole being adorned with most elegant architecture, in true and beautiful perspective. The other was the marriage of Alexander with Roxana, the daughter of Darius, which was in every respect equal to the former. He was as last so strongly pressed to go to Naples, that he undertook the journey; and was received in that kingdom with all the respect and honour due to his merit; and there he finished several noble designs, as also at Gaeta his native city. While he continued at Naples, he received in the royal presence a snuff-box of very great value, presented.

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presented to him in the king's name by the marquis of Tanucci, at that time prime minister; and in the year 1757, the king was pleased to ennoble him and all his descendants. At that time he was 78, and it is confidently said, that he died in 1761 aged 82, which is very probable, though not positively certain. He understood perspective and architecture thoroughly, and added to it a fine understanding of the chiaro-scuro. His style of composition is grand and elegant; his design very correct; his disposition ingenious; his attitudes and expression full of truth, nature, and variety; and his colouring is excellent. The history of Diana and Actæon, by Conca, is in the possession of the earl of Pembroke at Wilton.

CONCALE BAY, is on the coast of France in Brittany, where the British forces landed in June 1758, in order to go to St Maloes; which they did, and burnt all the ships in that harbour, which were above 100, of all sorts. Concale is the town which gives name to the bay, and is famous for oysters. It is 18 miles east of St Maloes, and 197 west of Paris. W. Long. 1. 47. N. Lat. 48. 41.

CONCARNEAU, a town of France, in the department of Finisterre, with a harbour and a castle. E. Long. 4. 2. N. Lat. 47. 46.

CONCATENATION, a term chiefly used in speaking of the mutual dependence of second causes upon each other.

CONCAVE, an appellation used in speaking of the inner surface of hollow bodies, but more especially of spherical ones.

CONCAVE Glasses, such as are ground hollow, and are usually of a spherical figure, though they may be of any other, as parabolical, &c. All objects seen through concave glasses appear erect and diminished.

CONCENTRATION, in general, signifies the bringing things nearer a centre. Hence the particles of salt, in sea-water, are said to be concentrated; that is, brought nearer each other, by evaporating the watery part.

CONCENTRIC, in *Mathematics*, something that has the same common centre with another: it stands in opposition to *excentric*.

CONCEPTION, in *Logic*, the simple apprehension or perception which we have of any thing, without proceeding to affirm or deny any thing about it. Some writers, as Lord Kames, distinguish between conception and perception; making the latter to denote the consciousness of an object when present, or to include the reality of its object; whereas conception expresses the forming an idea of an object whether present or absent, or without any conviction of its reality.

CONCEPTION, in *Medicine*, denotes the first formation of the embryo, or fœtus, in the womb.

Conception is no other than such a concurrence and commixture of the prolific seed of the male with that of the female, in the cavity of the uterus, as immediately produces an embryo.

The symptoms of conception or pregnancy are, when, in a few days after the conjugal act, a small pain is perceived about the navel, and is attended with some gentle commotions in the bottom of the abdomen; and within, one, two, three, or even four, months, the menses cease to flow, or prove in less quantity than usual. Upon the first failure of this

kind, the woman begins to count the series of her weeks, without taking any notice of the time before elapsed; after this, or between the second or third months, but generally about the third, the motions of the embryo become perceivable to the mother; who hereupon becomes troubled with a nausea, vomiting, loathing, longing, &c. About this time the breasts begin to swell, grow hard and painful, and contain a little milk; the nipples also become larger, firmer, and darker coloured, a livid circle appearing round them; the eyes seem sunk and hollow. During the two first months of pregnancy, the woman grows thinner and slenderer; the abdomen being also depressed; though it afterwards distends, and grows gradually larger.

The manner wherein conception is effected is thus laid down by the modern writers: In the superficies of the ovaries of women, there are found little pellucid spherules, consisting of two concentric membranes filled with a lymphatic humour, and connected to the surface of the ovaria, underneath the tegument, by a thick calyx, contiguous to the extremities of the minute ramifications of the Fallopian tubes.

These spherules, by the use of venery, grow, swell, raise and dilate the membrane of the ovary into the form of papillæ; till, the head propending from the stalk, it is at length separated from it; leaving behind it a hollow cicatrix in the broken membrane of the ovary; which, however, soon grows up again.

Now, in these spherules, while still adhering to the ovary, fœtuses have been frequently found; whence it appears, that these are a kind of ova, or eggs, deriving their structure from the vessels of the ovary, and their liquor from the humours prepared therein.

Hence also it appears, that the Fallopian tubes being swelled and stiffened by the act of venery, with their muscular fimbriæ, like fingers, may embrace the ovaries, compress them, and by that compression expand their own mouths: and thus the eggs, now mature, and detached as before, may be forced into their cavities, and thence conveyed into the cavity of the uterus; where they may either be cherished and retained, as when they meet with the male seed: or, if they want that, again expelled.

Hence the phenomena of false conceptions, abortions, fœtuses found in the cavity of the abdomen, the Fallopian tubes, &c. For in coition, the male seed, abounding with living animalcules, agitated with a great force, a brisk heat, and probably with a great quantity of animal spirits, is violently impelled through the mouth of the uterus, which on this occasion is opener, and through the valves of the neck of the uterus, which on this occasion are laxer than ordinary, into the uterus itself; which now, in like manner, becomes more active, turgid, hot, inflamed, and moistened with the flux of its lymph and spirits, by means of the titillation excited in the nervous papillæ by the attrition against the rugæ of the vagina.

The semen thus disposed in the uterus, is retained, heated, and agitated, by the convulsive constriction of the uterus itself; till meeting with the ova, the finest and most animated part enters through the dilated pores of the membranula of the ovum, now become glandulous; is there retained, nourished, dilated; grows to its umbilicus, or navel; stifles the other less lively animalcules; and thus is conception effected.

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Hence it appears, that conception may happen in any part where the semen meets with an ovum: thus whether it be carried through the Fallopian tube to the ovary, and there cast upon the ovum; or whether it meet with it in some recess of the tube itself; or, lastly, whether it join it in the cavity of the uterus, it may still have the same effect, as it appears from observation actually to have had. But it is probable, that conception is then most perfect when the two, viz. the semen and ovum, are carried at the same time into the uterus, and there mixed, &c.

According to other physiologists the male seed is taken up, before it arrives in the uterus, by the veins which open into the vagina, &c. and thus mixed with the blood; by which, in the course of circulation, it is carried, duly prepared, into the ovary, to impregnate the eggs.

It has been advanced by several writers, that women may possibly conceive in their sleep, and be with child without any knowledge of the occasion of it. As ridiculous and absurd as this doctrine may appear to the generality of the world, no less an author than Genili has thought it worthy a particular dissertation.

CONCEPTION, *Immaculate, of the Holy Virgin*, is a feast established in honour of the holy virgin, particularly with regard to her having been conceived and born *immaculate*, i. e. without original sin, held in the Romish church on the 8th of December. The immaculate conception is the great head of controversy between the Scotists and Thomists; the former maintaining, and the latter impugning it. In the three Spanish military orders, of St James of the sword, Calatrava, and Alcantara, the knights take a vow at their admission to defend the immaculate conception. This resolution was first taken 1652. Peter d'Alva has published 48 huge volumes in folio on the mysteries of the conception.

CONCEPTION, an episcopal town of Chili in South America. It is situated in W. Long. 72. 50. S. Lat. 36. 40; and is the oldest European settlement in Chili, and the second in point of dignity. On their first settlement here, the Spaniards were repeatedly driven off by the Indians, so that they were obliged to take up their residence at St Jago. Since that time both the cities of Conception and St Jago have been frequently destroyed by earthquakes. In the year 1751 both of them were laid in ruins by a dreadful shock, the first concussions of which were attended with an unusual swelling of the sea, that overturned the few houses which had escaped the ravages of the earthquake. The harbour is good and pretty much frequented; on which account the city is regarded as a place of consequence. The king allows annually 350,000 pieces of eight for the support of a garrison of 3500 men; a

corps that is seldom complete. None of the fortifications are considerable; but those towards the land are wretched. The Spaniards now live in tolerable security with respect to the Indians, and have no notion of any attack from the land side. It is said indeed, that not only this but all the settlements in Chili and Peru would fall an easy prey to the attacks of a foreign enemy; the fortifications being in ruins, and the garrisons scarce half the number required by the king: owing to the avarice, ignorance, and supine negligence of the governors, who study nothing but to enrich themselves.

CONCEPTION, a town of North America, in New Spain, and in the audience of Guatemala. It is seated near the sea-coast, 100 miles west of Porto-bello, and a small river that runs into the sea. W. Long. 81. 45. N. Lat. 10. 0.

CONCERT, or CONCERTO, in *Music*, a number or company of musicians, playing or singing the same piece of music or song at the same time.

CONCERTATO intimates the piece of music to be composed in such a manner, as that all the parts may have their recitativos, be it for two, three, four, or more voices or instruments.

CONCERTO GROSSI, the grand chorus of a concert, or those places where all the several parts perform or play together.

CONCESSION, in general, signifies either the act of granting or yielding any thing, or the thing itself which is so granted or yielded.

CONCESSION, in *Rhetoric*, a figure, whereby something is freely allowed, that yet might bear dispute, to obtain something that one would have granted to him, and which he thinks cannot fairly be denied, as in the following concession of Dido, in Virgil:

"The nuptials he disclaims, I urge no more;
"Let him pursue the promis'd Latian shore.
"A short delay is all I ask him now;
"A pause of grief, an interval from wo."

CONCHA, in *Zoology*, a synonyme of the MYTILUS, SOLEN, and other shell-fish.

CONCHES, a town of Normandy, with a Benedictine abbey, which carries on a considerable trade. It is seated on the top of a mountain, in the territory of Ouche, 45 miles north-west of Paris. E. Long. 0. 51. N. Lat. 48. 58.

CONCHITES MARMOR, a name given by the ancients to a species of marble dug near Megara, and remarkable for containing a great number of sea-shells, and other marine bodies, immersed in it.

CONCHOID, in *Geometry*, the name of a curve, given to it by its inventor Nicomedes. See FLUXIONS.

Concep-
tion
||
Conchoid.

C O N C H O L O G Y,

Introduc-
tion.

IS that department of natural history which treats of testaceous animals. In the Linnæan arrangement it constitutes the third order of the class of Vermes. This is the order *testacea*, of which we propose to lay
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before our readers a pretty full view in the present treatise. The peculiarity and extent of this order of animals have induced us to consider it in a separate treatise, by which means we shall avoid swelling out to

¹History. an inconvenient magnitude, the class of Vermes which will be treated of in its proper place in the course of the work.

²Importance of conchology.

The fine polish, splendid colours, and elegant form of shells, have been long admired, and have procured for them a conspicuous place in the cabinets of the curious. Indeed in this respect, mankind have discovered no small degree of folly and extravagance, in the high price which has been given for rare and beautiful shells, and often only on account of their rarity. But the study of conchology acquires a higher degree of importance and utility in another view. In many parts of the world, different kinds of testaceous animals are employed as an excellent and nutritious food; and some tribes supply the table with a delicate luxury. Different shells furnish employment to ingenuity and art, in the manufacture of mother-of-pearl for various purposes; and the pearl itself, so much sought after as an ornament of dress, and often the rival of the richest

gems, in the estimation of mankind, is the production of testaceous animals. Its nature and mode of formation, therefore, cannot fail to be objects of curious investigation. But testaceous animals and their productions, are not only beneficial and ornamental; some are found to be highly pernicious. The snail ravages the garden and the field, and marks its progress with the destruction of some of the fairest of the vegetable tribes; while the ship-worm is justly the dread of the mariner; secure, as it were, in its insignificance, humbles the glory and pride of man; and labouring in secret, demolishes the noblest efforts of ingenuity. In these views, then, the economy and habits of testaceous animals, which at first sight might appear a barren and useless pursuit, become an important and beneficial subject of investigation. The following chapters, therefore, shall be occupied in the classification and natural history of this tribe of animals.

¹History.

CHAP. I. HISTORY OF CONCHOLOGY.

³Cultivated by the ancients.

THE few scattered fragments concerning the natural history of shells, or testaceous animals, which are to be found in the writings of the ancients, when compared with the more extended and systematic labours of the moderns, are so unimportant and inaccurate, that it would be altogether superfluous to trouble our readers with an account of the information which they contain. It appears, however, from the works of Aristotle and Pliny, the great naturalists of Greece and Rome, that the study of conchology was not entirely neglected in their time. It appears too, that admirers and collectors of shells were not then wanting. Scipio and Lælius, we are informed, found a relaxation from the toils and cares of war and government, by indulging in this elegant amusement (A).

⁴By the moderns.

Nor will it be attended with much advantage, to give a particular account of the works of the earlier writers on this subject, among the moderns. These are Gesner, Johnston, Rondeletius, Aldrovandus, Bellonius, Wormius, and some other authors, who cultivated this department of natural history, and accompanied their descriptions with figures, illustrative of the objects which they described.

The first author who attempted a systematic division of shells, according to their external form and characters, was John Daniel Major, professor of medicine in the university of Kiel in Holstein. His method is published at the end of his curious and interesting remarks on the treatise concerning the *purpura* of Fabius Columna, printed at Kiel in 1675. The system of the German naturalist was followed by that of our countryman Dr Lister, on a more extended and improved plan, which was published ten years after. Succeeding naturalists turned their attention to the study of conchology, and to the improvement of the classification of the numerous objects of this department of natural hi-

story. Such were Buonanni, Rumphius, Langius, Brey-nius, Tournefort, Gualtieri, D'Argenville, Klein, Lin-næus, Adanson, Geoffroy, and Muller.

We shall here exhibit some of the most celebrated systems of conchology which have been proposed by writers on this subject. This, we trust, will not be unacceptable to our readers, and particularly as the works of these authors are in few hands, and therefore become less accessible.

I. The first general arrangement of shells is that published by Dr Lister in a work with the following title. *Martini Lister, M. D. Historia sive Synopsis methodicæ Conchyliorum libri quatuor, continentes 1057 figuras ære nitidissime insculptas, a Susanna et Anna Lister depictas.* Londini, 1685—1688, folio. A second edition of the same work was published at Oxford in 1770, with additional figures.

⁵System of Lister.

SYSTEM OF LISTER.

LIB. I. De Cochleis Terrestribus.

PARS I. De Buccinis et Turbinibus terrestribus.

- SECT. 1. De Buccinis terrestribus a sinistra dextrorsum tortilibus, lævibus, edentulis.
 SECT. 2. De Buccinis terrestribus a sinistra dextrorsum tortilibus, edentulis, striatis.
 SECT. 3. De Buccinis terrestribus a sinistra dextrorsum tortilibus, apertura dentata.
 SECT. 4. De Buccinis terrestribus a dextra sinistrorsum tortilibus, apertura plana.
 SECT. 5. De Buccinis terrestribus a dextra sinistrorsum tortilibus, apertura dentata.
 SECT. 6. De Turbinibus terrestribus cochleæformibus, id est compactiore figura.

SECT.

(A) Lælium et Scipionem conchas et umbilicos ad Cajetam et ad Laurentum legere consueffe, et ad omnem animi remissionem ludumque descendere. *Cic. de Orat.* lib. ii.

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- Seçt. 7. Trochilus.
 Seçt. 8. De Turbinibus terrestribus, compressis edentulis, ipso ambitu acuto.
 Seçt. 9. De Turbinibus compressis, ambitu obtusiore, apertura edentula.
 Seçt. 10. De Turbinibus terrestribus compressis, a sinistra dextrorsum tortilibus, apertura dentata.
 Seçt. 11. De Turbinibus terrestribus compressis, apertura dentata, a dextra sinistrorsum tortilibus apice inverso ex ipsa apertura parte.

PARS II. Cochleæ nudæ terrestres, limaces quibusdam dictæ.

LIB. II. De Turbinibus et Bivalvibus aque dulcis.

PARS I. De Turbinibus.

- Seçt. 1. De Buccinis fluviatilibus.
 Seçt. 2. De Cochleis fluviatilibus.
 Seçt. 3. De Cochleis fluviatilibus compressis.

PARS II. De Testaceis bivalvibus fluviatilibus.

- Seçt. 1. De Musculis fluviatilibus, cardine dentato.
 Seçt. 2. De Musculis fluviatilibus, cardine lævi.
 Seçt. 3. De Pectunculis fluviatilibus.

LIB. III. De Testaceis bivalvibus marinis.

PARS I. De Testaceis bivalvibus, imparibus testis.

- Seçt. 1. Cap. 1. De Pectinibus ex utraque parte æqualiter auritis, striatis. Cap. 2. De Pectinibus æqualiter auritis, lævibus. Cap. 3. De Pectinibus inæqualiter auritis, non dentatis. Cap. 4. De Pectinibus inæqualiter auritis, dentatis.
 Seçt. 2. Cap. 1. De Ostreis apophysi plana longa recurva, angulo acuto desinente. Cap. 2. De Ostreis apophysi brevi, subter et quasi in occulto posita.
 Seçt. 3. De Spondylis.

PARS II. De Testaceis bivalvibus, paribus testis.

- Seçt. 1. Cap. 1. De Pectinibus margaritifera. Cap. 2. De Pectinibus, binis apophysibus longis conjunctis. Cap. 3. De Pectinibus margaritifera polyginglymis.
 Seçt. 2. Cap. 1. De Pectunculis polyleptoginglymis, margine ex altera parte productiore. Cap. 2. De Pectunculis polyleptoginglymis, margine rotunda, striatis. Cap. 3. De Pectunculis polyleptoginglymis, margine rotunda, lævibus.
 Seçt. 3. Cap. 1. De Pectunculis lævibus, triquetris fere, cervice angustiore. Cap. 2. De Pectunculis lævibus, triquetris, cervice latiore. Cap. 3. De Pectunculis lævibus, rostro recurvo.
 Seçt. 4. Cap. 1. De Pectunculis fasciatis, lunula notatis margine striata. Cap. 2. De Pectunculis fasciatis, lunula quadam notatis, margine lævi. Cap. 3. De Pectunculis fasciatis, ad rostrum integris.
 Seçt. 5. Cap. 1. De Pectunculis striatis productioribus, striis a rostro ad medium usque dorsum concurrentibus. Cap. 2. De Pectunculis striatis diversimode exaratus, sive dissimilibus. Cap. 3. De Pectunculis striatis, striis similibus, dorso ad alterum latum paululum eminente. Cap. 4. De Pectunculis striatis, dorso in aciem compresso. Cap. 5. De Pectunculis striatis, muricatis asperisve. Cap. 6. De Pectunculis striatis, striis a rostro tantum deductis lævibus. Cap. 7. De Pectunculis cancellatis.

Cap. 8. De Pectunculis striatis, ex latere multo magis diffusis, latioribus. Cap. 9. De Pectunculis striatis, ex latere diffusis angustioribus. Cap. 10. De Pectunculis striatis imbricatis.

Seçt. 6. Cap. 1. De Musculis marinis, cardine lævi minimeque dentato. Cap. 2. De Musculis marinis polyleptoginglymis.

Seçt. 7. Cap. 1. De Pinnis, margine velut præcisâ obtusave. Cap. 2. De Pinnis, margine producta et auctiore.

Seçt. 8. Cap. 1. De Tellinis, id est conchis fere cuneiformibus, ambitu ferrato. Cap. 2. De Tellinis quibus ambitus ex interna parte lævis est.

Seçt. 9. De Solenis, id est conchis tenuibus longissimisque ab utraque parte naturaliter hiantibus.

Seçt. 10. Cap. 1. De Chamis, ab altero tantum latere fere naturaliter hiantibus. Cap. 2. De Chamis pholadibus.

PARS II. De Testaceis multivalvibus.

Seçt. 1. Cap. 1. De Pholadibus triumve testarum conchis, cardinibus loculis quibusdam quasi perforatis. Cap. 2. De Pholadibus, cardine integro.

Seçt. 2. De Conchis quinque testarum anatifera ple-risque dictis.

Seçt. 3. De Balanis, id est, duodecim testarum conchis præter operculum mitratum.

Seçt. 4. Sive appendix ad librum tertium de conchitis iisve lapidibus, qui quandam similitudinem cum conchis marinis habeant.

LIB. IV. De Buccinis marinis, quibus etiam vermiculi dentalia et patellæ, numerantur.

Seçt. 1. Cap. 1. De Patellis, vertice perforato. Cap. 2. De Patellis, vertice integro, lævibus. Cap. 3. De Patellis, vertice integro, striatis, margine quasi radiata. Cap. 4. De Patellis, vertice adunco, margine æquali. Cap. 5. De Patellis, vertice adunco, margine obliqua. Cap. 6. De Patellis, vertice adunco, quibus ex interna parte cavitas quædam quasi arcuata, longis compressis. Cap. 7. De Patellis, vertice acuto, stilo quodam interno donatis.

Seçt. 2. De Dentalibus.

Seçt. 3. De Vermiculis.

Seçt. 4. Cap. 1. De Nautilus caudatis, sive e plurimis tabulatis confectis. Cap. 2. De Nautilus vacuis, sive non tabulatis.

Seçt. 5. Cap. 1. De Cochleis marinis, apice brevi, umbilicatis, sinu aurito. Cap. 2. De Cochleis marinis, apice brevi, umbilico simplici. Cap. 3. De Cochleis marinis, apice brevi, centro minime sinuato. Cap. 4. De Cochleis marinis, basi brevi, apice ad oris initium parum elato. Cap. 5. De Cochleis marinis, apice mediocriter producto, ore dentato. Cap. 6. De Cochleis marinis, apice mediocriter producto, ore edentulo, lævibus. Cap. 7. De Cochleis marinis, apice mediocriter producto, striatis. Cap. 8. De Cochleis marinis, clavicula tenui et longissima, striatis. Cap. 9. De Cochleis marinis, clavicula tenui et longissima, lævibus.

Seçt. 6. Cap. 1. De Neritis dentatis, clavicula paululum prominente. Cap. 2. De Neritis dentatis, clavicula compressa, striatis. Cap. 3. De Neritis dentatis, clavicula compressa, lævibus. Cap. 4. De Neritis ad columellam dentatis, labio productiore edentulo.

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edentulo. Cap. 5. De Neritis edentulis lævibus.
Cap. 6. De Neritis edentulis muricatis.

Seçt. 7. De Auribus marinis.

Seçt. 8. Cap. 1. De Trochis pyramidalibus, apertura five basi leviter tumida. Cap. 2. De Trochis pyramidalibus, basi paululum cava five sinuata. Cap. 3. De Trochis, apertura five basi plana. Cap. 4. De Trochis brevioribus, umbilicatis, dentatis. Cap. 5. De Trochis cochleæformibus, umbilicatis, edentulis. Cap. 6. De Trochis clavicula brevioris, columella paulo erectiore integra. Cap. 7. De Trochis, basi media leviter tumida, quasi altera clavicula. Cap. 8. De Trochis, unico dente ad columellam acuto.

Seçt. 9. Cap. 1. De Conchis venereis unicoloribus. Cap. 2. De Conchis venereis, lineis nigris secundum longitudinem depictis. Cap. 3. De Conchis undatim depictis. Cap. 4. De Conchis venereis fasciatis, immaculatis; et de conchis venereis fasciatis et maculatis, aut alias cum fasciis variegatis. Cap. 5. De Conchis venereis, punctis nigris distinctis. Cap. 6. De Conchis venereis, maculis albis nigrisve interspersis insignitis; et de conchis venereis maculis albis quasi reticulatim depictis. Cap. 7. De Conchis venereis, striis eminentibus conspicuis. Cap. 8. De Conchis venereis, punctis elatis exasperatis, nodisve inæqualibus. Cap. 9. De Conchis venereis, apertura non dentata, basi integra. Cap. 10. De Conchis venereis, basi umbilicata cochleata.

Seçt. 10. Cap. 1. De Rhombis cylindraceis columella dentata, crassis, unius coloris. Cap. 2. De Rhombis cylindraceis dentatis, maculosis. Cap. 3. De Rhombis cylindraceis dentatis, fasciatis. Cap. 4. De Rhombis cylindraceis dentatis, undatis. Cap. 5. De Rhombis cylindraceis dentatis, dorso gibboso. Cap. 6. De Rhombis cylindraceis eduntulis, ore strictiore. Cap. 7. De Rhombis edentulis tenuibus, ore patulo, clavicula paululum exserta. Cap. 8. De Rhombis edentulis, ore patulo, clavicula compressa.

PARS II. Cap. 1. De Rhombis cylindrico-pyramidalibus, unius coloris. Cap. 2. De Rhombis cylindrico-pyramidalibus, quibus lineæ maculatæ circum injiciuntur. Cap. 3. De Rhombis cylindrico-pyramidalibus, striatis. Cap. 4. De Rhombis cylindrico-pyramidalibus, undatis. Cap. 5. De Rhombis cylindrico-pyramidalibus, fasciatis. Cap. 6. De Rhombis cylindrico-pyramidalibus, reticulatis. Cap. 7. De Rhombis cylindrico-pyramidalibus, dentatis.

Seçt. 11. Cap. 1. De Buccinis percicis dictis. Cap. 2. De Buccinis muscicis dictis. Cap. 3. De Buccinis columella dentata, clavicula longissima et tenuissima.

Seçt. 12. Cap. 1. De Buccinis bilinguibus, lævibus. Cap. 2. De Buccinis bilinguibus, striatis. Cap. 3. De Buccinis bilinguibus, asperis et muricatis. Cap. 4. De Buccinis bilinguibus, digitatis.

Seçt. 13. Cap. 1. De Buccinis ampullaceis lævibus, aut certe minus asperis. Cap. 2. De Buccinis ampullaceis, muricatis. Cap. 3. De Buccinis ampullaceis, ad sinistram convolutis.

Seçt. 14. Cap. 1. De Buccinis utrinque productioribus, lævibus. Cap. 2. De Buccinis utrinque productioribus, striis densis et tenuioribus exasperatis. Cap. 3. De Buccinis utrinque productioribus, striis pauciori-

bus donatis, labro simplici. Cap. 4. De Buccinis utrinque productioribus, striis paucioribus, labro duplicato donatis. Cap. 5. De Buccinis utrinque productioribus, muricatis.

Seçt. 15. Cap. 1. De Buccinis brevirostris, nodosis. Cap. 2. De Buccinis brevirostris, striatis. Cap. 3. De Buccinis brevirostris, lævibus, fere clavicula productiore. Cap. 4. De Buccinis brevirostris, labro repando, tenuibus. Cap. 5. De Buccinis brevirostris, labro repando, crassis. Cap. 6. De Buccinis brevirostris, compressis. Cap. 7. De Buccinis auritis, five rostro recurvo donatis, ventriculosis. Cap. 8. De Buccinis brevirostris, sinu reflexo, lævibus. Cap. 9. De Buccinis brevirostris, rostro reflexo, clavicula productiore.

Seçt. 16. Seu appendix de buccinitis, iisve lapidibus que buccina omnigena valde referant.

II. In 1722, Langius presented to the world the following work on conchology. *Caroli Nicolai Langii Lucernen. Helvet. Phil. et Med. &c. Methodus nova, et facilis testacea marina pleraque, quæ huc usque nobis nota sint, in suas debitas et distinctas classes, genera, et species, distribuendi, nominibusque suis propriis, structuræ potissimum accommodatis nuncupandi, &c. Lucernæ, 1722. 4to. p. 102.*

SYSTEM OF LANGIUS.

PARS PRIMA. *Testacea marina univalvia non turbinata.*

CLASSIS PRIMA. *Testacea marina univalvia non turbinata, et in se non contorta.*

Seçt. 1. *Testacea marina univalvia non turbinata, et in se non contorta nullo modo, vel solummodo in summo apice tantillum incurvata.* Gen. 1. Patellæ. Gen. 2. Balani.

Seçt. 2. *Tubuli marini, seu testacea marina univalvia, non turbinata, et in se non contorta, elongata tubuli instar concava.* Gen. 1. Penicilla. Gen. 2. Dentales. Gen. 3. Tubuli radiceformis. Gen. 4. Tubuli vermiculares.

CLASSIS SECUNDA. *Testacea marina univalvia, non turbinata, sed ita in se contorta, ut eorum spiræ non promineant.*

Seçt. 1. *Testacea marina univalvia ita in se transverfim, vel oblique secundum longitudinem contorta, ut eorum circumvolutiones vix appareant.* Gen. 1. Nautili. Gen. 2. Nuces marinæ.

Seçt. 2. *Porcellanæ, seu testacea marina univalvia non turbinata.* Gen. 1. Porcellanæ vulgares. Gen. 2. Porcellanæ fimbriatæ. Gen. 3. Porcellanæ spirales. Gen. 4. Porcellanæ thoracicæ. Gen. 5. Porcellanæ minores integræ.

Seçt. 3. *Divis. 1. Cornua ammonis, quæ sunt testacea marina univalvia non turbinata, et serpentum in modum in se contorta, ut eorum circumvolutiones nulla ex parte promineant, et tamen ex utroque latere omnes appareant.* Gen. 1. Cornua ammonis unita. Gen. 2. Cornua ammonis anomala. *Divis. 2.* Gen. 1. Cornua ammonis simpliciter divisa. Gen. 2. Cornua ammonis integre divisa.

PARS

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PARS SECUNDA. *Cochleæ marinæ, seu testacea marina univalvia turbinata, quæ unica tantum constant valva et figura sua cochlearum in modum intorta sunt, ita ut intima eorum spira aliquo saltem modo promineat et producat.*

CLASSIS PRIMA. Cochleæ marinæ longæ, seu cochleæ marinæ ore admodum elongato et superius aperto.

SECT. 1. Cochleæ marinæ longæ ore labiis rectis. Gen. 1. Cochleæ pyramidales. Gen. 2. Cochleæ cylindroidæ.

SECT. 2. Cochleæ longæ pyriformes, seu cochleæ marinæ longæ ore labiis leviter incurvatis, ideoque etiam leviter ventricosæ. **DIVIS. 1.** Cochleæ longæ pyriformes minores. Gen. 1. Cochleæ longæ pyriformes minores, vulgares. Gen. 2. Cochleæ longæ pyriformes minores intortæ integræ. Gen. 3. Cochleæ longæ pyriformes minores intortæ et infulcatæ. **DIVIS. 2.** Cochleæ longæ pyriformes majores. Gen. 1. Cochleæ longæ pyriformes majores vulgares. Gen. 2. Cochleæ longæ pyriformes majores, intortæ integræ. Gen. 3. Cochleæ longæ pyriformes majores intortæ cylindroidæ.

CLASSIS SECUNDA. Cochleæ canaliculatæ, seu cochleæ marinæ ore elongato et superius in canaliculum abeunte.

SECT. 1. Cochleæ marinæ canalicula recta. Gen. 1. Cochleæ canaliculatæ rectæ tenuiores. Gen. 2. Cochleæ canaliculatæ rectæ crassiores. Gen. 3. Purpuræ rectirostræ.

SECT. 2. Cochleæ marinæ canaliculatæ incurvatæ. Gen. 1. Cochleæ canaliculatæ introrsum incurvatæ. Gen. 2. Cochleæ canaliculatæ extrorsum incurvatæ. Gen. 3. Murcius. Gen. 4. Cochleæ muriciformes insigniter incrispatæ. Gen. 5. Purpuræ curvirostræ. Gen. 6. Cochleæ cassidiformes umbilicatæ. Gen. 7. Cassidæ.

CLASSIS TERTIA. Buccina sunt cochleæ marinæ ore et mucrone simul elongatis, primaque spira notabiliter ventricosa.

SECT. 1. Buccina parva mucrone mediocriter elongato et tenuiter acuminato. Gen. 1. Buccina parva pruni-formia acuminata. Gen. 2. Buccina parva pruni-formia canaliculata. Gen. 3. Buccina parva curvirostra. Gen. 4. Buccina parva fulcata. Gen. 5. Buccina parva fulcata et canaliculata. Gen. 6. Buccina parva integra ore perpendiculari. Gen. 7. Buccina parva integra ore obliquo.

SECT. 2. Buccina majora, quæ sunt buccina mucrone admodum elongato et acuminato. Gen. 1. Buccina majora canaliculata rostrata, ore simplici. Gen. 2. Buccina majora canaliculata, ore labioso. Gen. 3. Buccina majora canaliculata rostrata, ore labioso, fimbriata. Gen. 4. Buccina majora canaliculata et fulcata.

CLASSIS QUARTA. Strombi, qui sunt cochleæ marinæ ore et mucrone simul insigniter elongatis, et prima spira notabiliter angustiore quam in buccinis.

SECT. 1. Strombi ore superius aperto. Gen. 1. Strombi

canaliculati acuminati. Gen. 2. Strombi canaliculati rostrati, ore simplici. Gen. 3. Strombi canaliculati rostrati, ore anguloso. Gen. 4. Strombi canaliculati rostrati, ore labioso. Gen. 5. Strombi fulcati vulgares. Gen. 6. Strombi fulcati, ore labioso.

SECT. 2. Strombi integri, ore superius clauso, seu integro. Gen. 1. Strombi integri vulgares, ore simplici. Gen. 2. Strombi integri, ore labioso. Gen. 3. Strombi integri, ore fimbriato et dentato.

CLASSIS QUINTA. Cochleæ marinæ, ore admodum brevi seu parvo, mucrone vero insigniter elongato.

SECT. 1. Turbines aperti, seu cochleæ marinæ ore admodum brevi seu parvo superius aperto, mucrone longissimo. Gen. 1. Turbines apertilati. Gen. 2. Turbines aperti acuminati. Gen. 3. Turbines aperti canaliculati recte rostri. Gen. 4. Turbines aperti canaliculati oblique incurvati. Gen. 5. Turbines aperti fulcati.

SECT. 2. Turbines integri, ore superius clauso seu integro. Gen. 1. Turbines integri vulgares. Gen. 2. Turbines integri acuminati. Gen. 3. Turbines integri fimbriati.

SECT. 3. Trochi seu cochleæ marinæ ore admodum brevi, seu parvo e basi lata et quasi plana in mucronem quasi rectilineam conoideum insigniter elongatum abeuntes. Gen. 1. Trochi ore angusto et horizontaliter compresso. Gen. 2. Trochi ore ampliore et subrotundo.

CLASSIS SEXTA. Cochleæ marinæ breviores, seu cochleæ marinæ ore et mucrone brevioris magisque contracto.

SECT. 1. Cochleæ breviores proportionatæ. Gen. 1. Cochleæ trochiformes breviores proportionatæ et mucronatæ. Gen. 2. Cochleæ marinæ terrestri-formes breviores proportionatæ. Gen. 3. Cochleæ depressæ.

SECT. 2. Cochleæ marinæ breviores perpendiculariter anomalæ. Gen. 1. Neritæ. Gen. 2. Cochleæ umbilicatæ foramine spirarum semicirculari. Gen. 3. Cochleæ umbilicatæ foramine spirarum rotundo.

SECT. 3. Cochleæ marinæ breviores horizontaliter anomalæ. Gen. 1. Cochleæ planæ. Gen. 2. Aures marinæ.

SECT. 4. Varia hucusque enarratarum cochlearum opercula quæ aut propter usum aut propter singularem structuram, magis nota sunt. Gen. 1. Opercula cochlearum marinarum subrotunda. Gen. 2. Ungues marini, seu opercula cochlearum marinarum oblonga.

PARS TERTIA. *Conchæ marinæ, id est testacea marina bivalvia quæ duabus constant valvis in cardine, articulatione quadam inter se conjunctis, ut commode claudi et aperiri queant.*

SECT. 1. Conchæ marinæ notabiliter umbonatae et recta incurvatæ. Gen. 1. Conchæ marinæ valvis æqualibus æquilateræ. Gen. 2. Conchæ cordiformes umbone cardinum deducto. Gen. 3. Conchæ marinæ cordiformes æquilateræ, umbone cardinum unito. **SECT. 2.** Conchæ marinæ valvis æqualibus æquilateræ leviter umbonatae. Gen. 1. Conchæ crassæ. Gen. 2. Pectines

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Pectines tenues. Gen. 3. Pectuncul. Gen. 4. Conchæ pectiniformes æquilateræ subrotundæ. Gen. 5. Conchæ pectiniformes æquilateræ.

Sect. 3. Conchæ marinæ valvis æqualibus æquilateræ, notabiliter umbonatæ et oblique incurvatæ. Gen. 1. Conchæ marinæ incurvatæ subrotundæ vulgares. Gen. 2. Chamæ æquilateræ.

Sect. 4. Conchæ marinæ, valvis æqualibus æquilateræ leviter umbonatæ et oblique incurvatæ. Gen. 1. Conchæ marinæ valvis æqualibus subrotundæ. Gen. 2. Tellinæ æquilateræ.

Sect. 5. Pinnæ, seu conchæ marinæ valvis æqualibus æquilateræ, cardine umbone destituto. Gen. 1. Pinnæ rectæ. Gen. 2. Pinnæ incurvatæ.

CLASSIS SECUNDA. Conchæ inæquilateræ, seu conchæ marinæ valvis æqualibus ex utroque cardinis latere inæqualiter effusæ.

Sect. 1. Conchæ marinæ valvis æqualibus inæquilateræ notabiliter umbonatæ, et recta incurvatæ. Gen. 1. Conchæ marinæ valvis æqualibus inæquilateræ subrotundæ. Gen. 2. Conchæ marinæ cordiformes inæquilateræ, umbone cardine deducto. Gen. 3. Conchæ marinæ cordiformes inæquilateræ, umbone cardinum unito.

Sect. 2. Conchæ marinæ valvis æqualibus inæquilateræ, leviter umbonatæ et rectæ incurvatæ. Gen. 1. Conchæ marinæ leviter umbonatæ et recta incurvatæ subrotundæ.

Sect. 3. Conchæ marinæ valvis æqualibus inæquilateræ, notabiliter umbonatæ et oblique incurvatæ, subrotundæ vulgares. Gen. 1. Chamæ inæquilateræ. Gen. 2. Conchæ rhomboidales.

Sect. 4. Conchæ marinæ valvis æqualibus inæquilateræ leviter umbonatæ et oblique incurvatæ. Gen. 1. Conchæ marinæ, &c. subrotundæ. Gen. 2. Conchæ pectiniformes inæquilateræ triangulares. Gen. 3. Tellinæ inæquilateræ. Gen. 4. Conchæ tellinæformes. Gen. 5. Musculi. Gen. 6. Conchæ longæ rugosæ. Gen. 7. Conchæ soleniformes. Gen. 8. Mytili.

Sect. 5. Conchæ marinæ valvis æqualibus inæquilateræ, leviter umbonatæ et oblique incurvatæ, structura et striis peculiaribus. Gen. 1. Conchæ imbricatæ. Gen. 2. Pholades. Gen. 3. Dactyli. Gen. 4. Hysteroconchæ. Gen. 5. Conchæ alæformes. Gen. 6. Conchæ quadratæ.

Sect. 6. Conchæ inæquilateræ non umbonatæ, seu conchæ marinæ valvis æqualibus inæquilateræ, cardine umbonæ destituto. Gen. 1. Solenes. Gen. 2. Conchæ marinæ, &c. structura peculiari.

CLASSIS TERTIA. Conchæ anomalæ, seu conchæ marinæ valvis inæqualibus.

Sect. 1. Conchæ marinæ anomalæ umbonatæ et auritæ. Gen. 1. Pectines anomali. Gen. 2. Spondyli.

Sect. 2. Ostreæ, seu conchæ marinæ anomalæ omnino non vel irregulariter tantum umbonatæ rugosæ. Gen. 1. Ostrea vulgaris. Gen. 2. Ostrea denticulata. Gen. 3. Ostrea rostrata. Gen. 4. Ostrea peculiaris.

III. A different system was proposed for the classification of testaceous animals by Breynius, in the following work, which was published in the year 1732.

7
Of Breynius.

History.

Joannis Philippi Breynii dissertatio physica de polythalamis, nova testaceorum classe, cui quædam præmittuntur de methodo testacea in classes et genera distribuendi: huic adjicitur commentatiuncula de belemnitis prussicis, tandemque sbediasma de Echinis methodice disponendis; Gedani, 1732, 4to.

SYSTEM OF BREYNIUS.

In this system the author has divided shells into the eight following classes, viz. 1. Tubulus. 2. Cochlidium. 3. Polythalamium. 4. Lepas. 5. Concha. 6. Conchoides. 7. Balanus. 8. Echinus.

1. *Tubulus*, est testa tubulosa monothalamia, vel in lineam rectam extensa, vel incurva, vel contorta, vel aliquando ad spiram, sed irregulariter, accedens. Huic pertinent dentalia, entalia, solenes univalvi, &c.

2. *Cochlidium*, est testa tubulosa, monothalamia, conica, inspirans constanter regularem, convoluta aliquando opercula prædita, sepius vero eo destituta. Ad hanc classem spectant nautili tenues sive vacui vulgo dicti; aures marinæ, neritæ, cochleæ, buccina, murices, cassides, cylindri, volutæ, porcellanæ, et omnes testæ turbinatæ, exceptis nautilo et anomia, ad classem tertiam referendis.

3. *Polythalamium*, est testa tubulosa polythalamia, conica, recta, vel in spiram regularem convoluta, cum syphunculo thalamos transeunte: huic reducendi nautili, anomia, litui, et orthocerata.

3. *Lepas*, est testa vasculosa, simplex, referens vasculum magis minusve cavum, orificio multum patenta, ut patellæ similesque.

5. *Concha*, est testa vasculosa composita, bivalvis, id est quæ ex duabus componitur valvis, sive vasculis magis minusve concavus in cardine articulatione quadam inter se junctis ut aperiri et claudi queant; ut chamæ, mytili, tellinæ, pinnæ, ostreæ, pectines anomie.

6. *Conchoides*, est testa vasculosa composita bivalvis, sed quæ præterea et aliquot minoribus portiunculis testaceis componitur, ut pholades anatifere.

7. *Balanus*, est testa vasculosa composita, quæ præter unicam testam majorem alias portiones minores habet ex quibus componitur, ut balanus vulgo dictus.

8. *Echinus*, est testa vasculosa composita undique clausa; magis minusve concava, duobus tantum foraminibus seu aperturis pro ore et ano perforata, externe aculeis vel claviculis mobilibus testaceis armata.

IV. The system of Tournefort appeared for the first time, and was published from the author's manuscript in the treatise on conchology by Gualtieri. In this system shells are divided into three classes, viz. Monotoma, Ditoma, and Polyotoma.

SYSTEM OF TOURNEFORT.

Testacea dicuntur quorundam animalium integumenta, quæ testæ seu lateris duritiem habent, et in quibus tantum, in testa animalia vivant.

Testacea autem omnia quæ hucusque in musæis curiosorum adversari et congeri solent, ad tres classes facile revocari possunt. Hæc enim vel monotoma sunt, vel ditoma, vel polyotoma.

Monotoma testacea appellantur ea quorum testa indivisa est; ditoma quæ geminis constant testis ad cardinem

History. *dinem connixis; polytoma vero quæ ex pluribus simul adnexis compinguntur.*

CLASSIS PRIMA. Quæ testacea monotoma complectitur. Testacea monotoma quorum testa indivisa est, in tres familias abeant: alia enim univalvia sunt, alia spiralia, alia fistulosa.

Familia I. *Testaceorum univalvium.* Monotoma univalvia dicimus quorum testa simplex est in os amplius effusa. Gen. 1. Lepas. Gen. 2. Eruca.

Familia II. *Testaceorum spiralem.* Monotoma spiralia dicimus testacea quorum pars inferior in spiram contorquetur: horum autem spiræ seu helices exterius patent, et simpliciter spiralia dicuntur, vel eorum spiræ intus reconditur, et convoluta dicuntur.

Divis. 1. Testacea monotoma simpliciter spiralia, seu quorum spiræ exterior est. Gen. 1. Murex. Gen. 2. Murex alatus. Gen. 3. Murex aporrhais. Gen. 4. Murex venereus. Gen. 5. Murex pyramidalis. Gen. 6. Buccinum. Gen. 7. Buccino-murex. Gen. 8. Purpura. Gen. 9. Buccino-purpura. Gen. 10. Peribolus. Gen. 11. Turbo. Gen. 12. Verticillus. Gen. 13. Cochlea. Gen. 14. Cochlea terrestris. Gen. 15. Ceratites. Gen. 16. Cochlea marina. Gen. 17. Nerita. Gen. 18. Auris marina.

Divis. 2. Testacea monotoma spiralia convoluta, quæ cochleam interiorem habent vix foris conspicuam. Gen. 1. Concha venerea. Gen. 2. Concha persica. Gen. 3. Nautilus. Gen. 4. Conchilium.

Familia III. *Testaceorum fistulorum.* Testacea monotoma fistulosa seu tubulosa, ut ex nomine patet, fistulæ in modum tenuantur. Gen. 1. Dentale. Gen. 2. Entale. Gen. 3. Tubuli marini.

CLASSIS SECUNDA, quæ testacea ditoma continet. Testacea ditoma semper ex duabus testis ad cardinem articulatis compinguntur, et vel arcte undique clauduntur, vel utrinque hiant; unde in duas familias dividi possunt.

Familia I. Testaceorum ditomorum quæ arcte clauduntur. Gen. 1. Concha. Gen. 2. Conchula. Gen. 3. Ostreum. Gen. 4. Mytilus. Gen. 5. Pinna. Gen. 6. Perna. Gen. 7. Pholas. Gen. 8. Pecten. Gen. 9. Pectunculus.

Familia II. Testaceorum ditomorum quæ semper hiant. Gen. 1. Chamæ. Gen. 2. Solen.

CLASSIS TERTIA, quæ testacea polytoma continet. Polytoma testacea dicuntur quorum testæ ex pluribus partibus vel articulatis, vel per cartilaginem connexis compinguntur; unde in duas familias abeunt.

Familia I. Eorum quorum partes articulantur. Gen. 1. Echinus.

Familia II. Eorum quorum partes per cartilaginem connectuntur. Gen. 1. Balanus.

the engravings, which are 80 in number, and are executed with great accuracy and elegance. But the descriptions of the genera and species only reach the 19th plate; so that the work which was published in 1780 is still unfinished.

History.

SYSTEM OF D'ARGENVILLE.

In this system shells are divided into four parts. I. Sea-shells. II. Fresh-water-shells. III. Land-shells. IV. Fossil-shells.

PART I. Sea-shells are divided into 3 Classes. 1. Univalves. 2. Bivalves. 3. Multivalves.

Class I. contains 15 families; viz. 1. Lepas. 2. Oreilles de mer. 3. Tuyaux et Vermisseaux de mer. 4. Nautilus. 5. Limaçons à bouche ronde. 6. Limaçons à bouche demi-ronde. 7. Limaçons à bouche aplatie. 8. Cornets ou Volutes. 9. Olives ou Cylindres. 10. Rochers ou Murex. 11. Tonnes. 12. Porcelaines. 13. Buccins. 14. Pourpres. 15. Vis.

Class II. contains 7 families, viz. 1. Huitres. 2. Cames. 3. Tellines. 4. Moules. 5. Cœurs. 6. Peignes. 7. Manches de couteaux.

Class III. consists of 7 families, viz. 1. Oscabrions, ou lepas à huit pieces. 2. Ourfins. 3. Glands de mer. 4. Pouffe-pieds. 5. Conques anatifères. 6. Pholades. 7. Tuyaux de mer multivalves.

PART II. Fresh water-shells are divided into 2 Classes. 1. Univalves. 2. Bivalves.

Class I. contains 8 families, viz. 1. Lepas. 2. Nautilus ou cornes d'amon. 3. Limaçons à bouche ronde. 4. Limaçons à bouche demi-ronde. 5. Limaçons à bouche triangulaire. 6. Tonnes. 7. Buccins. 8. Vis.

Class II. is composed of two families. 1. Cames. 2. Tellines.

PART III. Land-shells, constituting a single class, viz. Univalves, which contains 6 families; viz. 1. Lepas. 2. Limaçons à bouche ronde. 3. Limaçons à bouche demi-ronde. 4. Limaçons à bouche aplatie. 5. Buccins. 6. Vis.

PART IV. Fossil shells, which consist of 3 classes. 1. Univalves. 2. Bivalves. 3. Multivalves.

Class I. is composed of 15 families, having the same names as the first class of sea-shells.

Class II. contains 7 families similar to the 2d class of sea-shells.

Class III. consists of 5 families, viz. 1. Ourfins. 2. Glands de mer. 3. Pouffe-pieds. 4. Pholades. 5. Tuyaux multivalves.

VI. A system of Conchology was published by Klein¹⁰ in 1753, and illustrated with engravings. In the same work the author enters into an investigation concerning the formation, increase, and colours of shells. The following is an abridged view of this arrangement.

SYSTEM

⁹
Of D'Ar-
genville.

V. M. D'Argenville in 1742, published at Paris a treatise on Conchology with 33 plates. A second edition of the same work appeared at Paris in 1757. In this edition the number of the plates was increased to 41. A more splendid edition was published after the death of the author, by M. M. de Favanne de Montcerville father and son. This edition is extended to 3 volumes, two of which consist of letter press, and the 3d contains

SYSTEM OF KLEIN.

In this system, shells are divided into 6 parts.

PART I. which is entitled Cochlis, is divided into 2 sections, viz. Cochlis simplex, and Cochlis Composita.

SECT. I. consists of 8 classes, viz. 1. Cochlis plana, containing 4 genera. 2. Cochlis convexa, 6 genera. 3. Cochlis fornicata, 5 genera. 4. Cochlis elliptica, 6 genera. 5. Cona-cochlis, 16 genera. 6. Cochlea, 8 genera. 7. Buccinum, 5 genera. 8. Turbo, 14 genera.

SECT. II. Consists of five classes, viz. 1. Cochlis rostrata, 7 genera. 2. Voluta longa, 15 genera. 3. Voluta ovata, 8 genera. 4. Alata, 6 genera. 5. Murex, 2 genera.

PART. II. Concha is also divided into 2 sections, viz. Monoconchæ and Diconchæ æquales.

SECT. I. contains 2 classes, viz. 1. Patella, 2 genera. 2. Anata, 4 genera.

SECT. II. consists of three subdivisions, viz. 1. Diconchæ conniventes. 2. Diconchæ interruptæ. 3. Diconchæ inæquales.

Subdiv. 1. is composed of 6 classes, viz. 1. Diconchæ figuratæ, 4 genera. 2. Ostreum, 6 genera. 3. Musculus, 3 genera. 4. Cyclas. 5. Diconcha aurita, 9 genera. 6. Diconchæ cordiformes, 3 genera.

Subdiv. 2. consists of 5 classes, viz. 1. Diconcha fulcata. 2. Diconchæ umbilicatæ, 3 genera. 3. Diconchæ finu profundo, feu chamæ, 3 genera. 4. Diconchæ finu prominulo, feu tellinæ, 6 genera. 5. Pyloris, 9 genera.

Subdiv. 3. Diconchæ inæquales, 7 genera.

PART III. Polyconchæ consists only of one genus.

PART IV. Niduli Testacei comprehends one class, viz. Balanus, which includes 4 genera.

PART V. Echinus marinus, feu echinodermata, is divided into 3 sections, viz. 1. Anocyfii. 2. Cato-cyfi. 3. Pleurocyfii.

SECT. I. contains 2 classes, viz. 1. Cidaris, 9 genera. 2. Clipeus, 1 genus.

SECT. 2. is composed of four classes, viz. 1. Fibula, 2 genera. 2. Clafis, 2 genera. 3. Scutum, 2 genera. 4. Placenta, 3 genera.

SECT. III. consists of 3 classes, viz. 1. Arachnoides, 1 genus. 2. Cor marinum, 2 genera. 3. Ovum marinum, 2 genera.

PART VI. Tubulus marinus is composed of 11 genera.

In the systems of Conchology which we have now exhibited, the characters are taken from the shells. In the three following, the marks of discrimination are derived from the animal as well as from the shell. The first by M. Adanson was published in 1757.

SYSTEM OF ADANSON.

This system consists of 3 classes, viz. 1. Limaçons. 2. Les conques. 3. Les conques multivalves.

CLASS I. Limaçons. SECT. I. Limaçons univalves. SECT. II. Limaçons operculés.

SECT. I. Famille. 1. Les limaçons univalves qui n'ont ni yeux ni cornes. Gen. 1. La gondole, *cymbium*. Famille 2. Les limaçons univalves qui ont deux cornes, et les yeux placés à leur racine et sur leur côte interne. Gen. 2. Le bulin, *bulinus*. Gen. 3. Le corret, *coretus*. Gen. 4. Le pietin, *pedipes*. Famille 3. Les limaçons univalves qui ont quatre cornes, dont les deux extérieures portent les yeux sur leur sommet. Gen. 5. Le limaçon, *cochlea*. Gen. 6. L'ormier, *balotis*. Famille 4. Les limaçons univalves qui ont deux cornes, et les yeux placés à leurs racines, et sur la côte externe, ou par derrière. Gen. 7. Le lepas, *lepas*. Gen. 8. L'yet yetus. Gen. 9. La vis, *terebra*. Famille 5. Les limaçons univalves qui ont deux cornes et les yeux posés un peu au-dessus de leur racine, et sur leur côte externe. Gen. 10. La porcellaine, *porcellana*. Gen. 11. Le pucelage, *cypræa*. Gen. 12. Le mantelet, *peribolus*.

SECT. 2. Famille 1. Limaçons operculés qui ont deux cornes, avec un renflement, et qui portent les yeux ordinairement au-dessus de leur racine, et à leur côté externe. Gen. 1. Le rouleau, *strombus*. Gen. 2. La pourpre, *purpura*. Gen. 3. Le buccin, *buccinum*. Gen. 4. Le cerite, *ceritium*. Famille 2. Limaçons operculés, qui ont deux cornes sans renflement, et les yeux placés à leur racine, et sur leur côté externe. Gen. 5. Le vermet, *vermetus*. Gen. 6. La toupie, *trochus*. Gen. 7. La natic, *natica*. Famille 3. Les limaçons operculés, qui ont quatre cornes, dont les deux extérieures portent les yeux sur leur sommet. Gen. 8. Le sabot, *turbo*. Gen. 9. La nerite, *nerita*.

CLASS II. Les conques. SECT. I. Les conques bivalves. Famille 1. Les conques bivalves, qui ont les deux lobes du manteau séparés, dans tout leur contour. Gen. 1. L'huitre, *ostreum*. Famille 2. Les conques bivalves dont les deux lobes du manteau forment trois ouvertures sans aucun tuyau. Gen. 2. Le jataron, *jataronus*. Gen. 3. Le jambonneau, *perna*. Famille 3. Les conques bivalves dont les deux lobes du manteau forment trois ouvertures dont deux prennent la figure d'un tuyau assez long. Gen. 4. La came, *chama*. Gen. 5. La telline, *tellina*. Gen. 6. Le peçoncle, *pectunculus*. Gen. 7. Le solen, *solen*.

CLASS III. Les conques multivalves. Famille 1. Les conques multivalves, dont aucune des pièces de la coquille ne prend la forme d'un tuyau. Gen. 1. La pholade, *pholas*. Famille 2. Les conques multivalves, dont une des pièces de la coquille prend la forme d'un tuyau qui enveloppe entièrement toutes les autres. Gen. 2. Le taret, *teredo*.

VIII. The method of Geoffroy, formed on similar principles with the last, was published at Paris in 1767, in a work entitled "A Summary Treatise on the testaceous Animals found in the vicinity of Paris." The following is a view of this method.

SYSTEM OF GEOFFROY.

SECT. I. Coquilles univalves. Gen. 1. Le limax, *cochlea*. Quatre tentacules, dont deux plus grands portent des yeux à leur extrémité. Coquille univalve en spirale.

Gen.

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Gen. 2. Le buccin, *buccinum*. Deux tentacules plats en formes d'oreilles. Les yeux placés à la base des tentacules du côté intérieur. Coquille univalve en spirale et conique.

Gen. 3. Planorbe, *planorbis*. Deux tentacules filiformes. Les yeux placés à la base des tentacules du côté intérieur. Coquille univalve en spirale, et ordinairement applatie.

Gen. 4. La nerite, *nerita*. Deux tentacules. Les yeux placés à la base des tentacules du côté extérieur. Opercule à la coquille. Coquille univalve en spirale et presque conique.

Gen. 5. Ancile, *ancylus*. Deux tentacules. Les yeux placés à la base des tentacules du côté inférieur. Coquille univalve concave et unie.

SECT. II. Coquilles univalves.

Gen. 1. La càmè, *chama*. Deux siphons simples et alongées. Charniere de la coquille dentelle. Coquille arrondée.

Gen. 2. La moule, *mytilus*. Deux siphons courts et frangés. Charniere de la coquille membraneuse et sans dents. Coquille alongée.

13
Of Muller.

IX. The system of Muller first published in 1773, and afterwards extended in a different work which appeared in 1776, arranges testaceous animals into three families. The following is a view of this arrangement taken from the latter work on the zoology of Denmark and Norway.

SYSTEM OF MULLER.

FAMILIA I. *Testacea Univalvia*.

SECT. I. Testacea univalvia, testa pervia.

Gen. 1. *Echinus*. Testa crustacea, ano verticali, tentaculis simplicibus.

Gen. 2. *Spatagus*. Testa crustacea, ano infero, tentaculis penicillatis.

Gen. 3. *Dentalium*. Testa calcarea, testa rudi, tentaculis nullis.

SECT. II. Testacea univalvia, testa patula.

Gen. 4. *Akera*. Apertura effusa, tentaculis nullis.

Gen. 5. *Argonauta*. Apertura profunda, tentaculis binis.

Gen. 6. *Bulla*. Apertura repanda, tentaculis binis setaceis, colliculo extrinfecus oculatis.

Gen. 7. *Buccinum*. Apertura ovata, tentaculis binis triangularibus, angulo intrinfeco oculatis.

Gen. 8. *Carychium*. Apertura ovata, tentaculis binis truncatis conspicuis, angulo intrinfeco oculatis.

Gen. 9. *Vertigo*. Apertura subquadrata, tentaculis binis sublinearibus, apice oculatis.

Gen. 10. *Turbo*. Apertura orbiculari, tentaculis binis setaceis, conspicuis, angulo extrinfeco oculatis.

Gen. 11. *Helix*. Apertura lunari, tentaculis quatuor linearibus, apice oculatis.

Gen. 12. *Planorbis*. Apertura semilunari, tentaculis binis setaceis, angulo intrinfeco oculatis.

Gen. 13. *Ancylus*. Apertura totali tentaculis binis truncatis, occultis, angulo extrinfeco oculatis.

Gen. 14. *Patella*. Apertura totali, tentaculis binis setaceis, occulto angulo, extrinfeco oculatis.

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Gen. 15. *Haliotis*. Apertura repanda, poris pertusa.

SECT. III. Testacea univalvia, testa operculata.

Gen. 16. *Tritonium*. Libera, apertura canaliculata, tentaculis duobus linearibus, angulo extrinfeco oculatis.

Gen. 17. *Trochus*. Libera, apertura sub-tetragona, tentaculis duobus setaceis, colliculo extrinfeco oculatis.

Gen. 18. *Nerita*. Libera, apertura lunari, tentaculis duobus setaceis, angulo extrinfeco oculatis.

Gen. 19. *Valvata*. Libera, apertura circinnata, tentaculis duobus setaceis, angulo postico oculatis.

Gen. 20. *Serpula*. Adnata, apertura orbiculari, tentaculis pinnatis.

FAMILIA II. *Testacea Bivalvia*.

SECT. I. Testacea bivalvia cardine dentata.

Gen. 1. *Mya*. Testa altera extremitate hiantè; cardine dente crasso solitario.

Gen. 2. *Solen*. Testa utraque extremitate hiantè; cardine dente reflexo, sæpe gemino.

Gen. 3. *Tellina*. Siphone duplici murico; cardine dentibus utrinque tribus alternis.

Gen. 4. *Cardium*. Siphone duplici, cirrato, pedeque falciformi; cardine dentibus mediis alternis, remotis penentralibus.

Gen. 5. *Venus*. Siphone duplici, cirrata, pedeque laminæformi; cardine dentibus tribus approximatis, lateralibus divergentibus.

Gen. 6. *Mastra*. Cardine dente medio complicato, adjacente foveola.

Gen. 7. *Donax*. Cardine dentibus duobus, lateralique solitario.

Gen. 8. *Arca*. Cardine dentibus numerosis, alternis, penetrantibus.

Gen. 9. *Terebratula*. Branchiis circinnatis; cardine dentibus alterius uncinatis, valvula superiore deorsum perforata.

SECT. II. Testacea bivalvia, cardine edentulo.

Gen. 10. *Anomia*. Branchiis simplicibus; valvula inferiore perforata.

Gen. 11. *Ostrea*. Branchiis simplicibus, pede nullo; cardines fossula cava.

Gen. 12. *Pecten*. Branchiis cirratis, pede juxta auriculam cardine fossula ovata, byssum emittens.

Gen. 13. *Mytilus*. Siphone duplici brevi; fossula lineari, byssum emittens.

FAMILIA III. *Testacea Multivalvia*.

Gen. 1. *Gbiton*. Valvulæ dorsales, tentacula nulla.

Gen. 2. *Lepas*. Valvulæ erectæ, tentacula bipartita.

Gen. 3. *Pholas*. Valvulæ ad cardinem minores.

X. To this account of the different methods of arranging shells we shall only add the system proposed by Da Costa in his Elements of Conchology. In this system the author adopts the usual general division into Univalves, Bivalves, and Multivalves.

I. UNIVALVES are distributed into 16 families which are divided into four orders.

Order I. Simple; consists of four families. 1. Patella. 2. Haliotis. 3. Vermiculi. 4. Dentalia. Order II. includes only one family. 5. Polythalamia. Order III. Revolved. Fam. 6. Turbinata involuta. Order IV. Turbinated

Animals which inhabit shells. binated. Fam. 7. Cymbium. Fam. 8. Auris cochlea. 9. Cylindri. Fam. 10. Voluta. Fam. 11. Globosa. Fam. 12. Cassides. Fam. 13. Trochi. Fam. 14. Cochleæ. Fam. 15. Buccina. Fam. 16. Murex.

II. BIVALVES composed of 3 orders.

Order I. With unequal valves, and shut close. Fam. 1. Pecten. Fam. 2. Spondylus. Fam. 3. Ostreum. Fam. 4. Anomia. Ord. II. With equal valves,

and shut close, is divided into three sections. Sect. 1. Mult-articulate. Fam. 5. Pectinoides. Fam. 6. Pectunculi. Fam. 7. Arca. Sect. 2. Articulate. Fam. 8. Pectunculus. Fam. 9. Tellina. Fam. 10. Placenta. Sect. 3. Inarticulate. Fam. 11. Margaritifera. Fam. 12. Mufculus. Ord. III. With valves that never shut close. Fam. 13. Chama, *Gapers*.

Animals which inhabit shells.

III. MULTIVALVES contains one order. Fam. 14. Pholas. Fam. 15. Anatiferae. Fam. 16. Balani.

CHAP II. OF THE ANIMALS WHICH INHABIT SHELLS.

15
Generic characters of testaceous animals.

BEFORE we proceed to the classification of shells, we shall here give a short description of the animals which inhabit them. Of these, however, a minute and accurate anatomical description is not to be expected; for little more is known of the structure of these animals than what has been given by naturalists concerning their external characters.

Some of the animals, which inhabit shells, are also found in the *mollusca* state; that is, without any testaceous covering. Such, for instance, is the *limax*, or snail.

The animals which have been found inhabiting shells, are the following; viz. *Doris*, *Triton*, *Ascidia*, *Tethys*, *Limax*, *Spio*, *Amphitrite*, *Terebella*, *Nereis*.

Doris.—The body is creeping, oblong, and flat beneath; the mouth is placed below, on the forepart; vent behind on the back, and surrounded by a fringe. Feelers two or four, situated on the upper part of the body in front, and retractile within their proper receptacles.

The animal which inhabits the chiton belongs to this genus.

Triton.—The body is oblong, and the mouth is furnished with an involute spiral proboscis: tentacula or arms 12, six on each side, divided nearly to the base. The hind ones cheliforous.

The triton inhabits different species of lepas.

Ascidia. The body is fixed, roundish, and apparently issuing from a sheath; apertures two, generally placed near the upper end, one beneath the other. The animals are found in the sea, and adhere by their base to rocks, shells, and other submarine substances: they are more or less gelatinous. The only powers of motion which they possess seem to be that of contracting and dilating themselves alternately; by which means they are enabled to throw out the water which they take in with considerable force.

This animal inhabits the pholas, solen, some species of the mya, maetra, and other bivalves.

Tethys.—The body is detached, rather oblong, fleshy, without peduncles: the mouth is furnished with a terminal cylindrical proboscis, under an expanded membrane or lip: apertures two, on the left side of the neck.

The tethys inhabits a great proportion of bivalve

shells, as many species of tellina, cardium, maetra, venus, ostrea, and others.

Limax.—The body is oblong, creeping, with a fleshy kind of shield above, and a longitudinal flat disc beneath: aperture placed on the right side within the shield: feelers 4, situated above the mouth, with an eye at the tip of each of the larger ones.

The animals belonging to this genus inhabit the turbinated univalve shells; but it appears that all the animals which inhabit these shells do not exactly correspond with the above generic characters.

Spio.—The body projecting from a tube, jointed and furnished with dorsal fibres; peduncles or feet rough with bristles, and placed towards the back; feelers 2; long, simple; eyes 2; long.

This animal inhabits some species of sabella.

Amphitrite.—Body projecting from a tube, and annulate; peduncles or feet small, numerous, with lateral fasciculi, and branchiæ; feelers 2, approximate, feathered; no eyes.

The amphitrite inhabits some species of sabella and serpula.

Terebella.—Body oblong, creeping, naked, furnished with lateral fasciculi, or tufts, and branchiæ; mouth placed before, furnished with lips, without teeth, and protruding a clavated proboscis; feelers numerous, ciliated, capillary, and placed round the mouth.

This animal is an inhabitant of many species of dentalium, serpula and sabella.

Nereis.—Body long, creeping, with numerous lateral peduncles or feet on each side; feelers simple, rarely none; eyes 2 or 4, rarely none. According to some naturalists, the nereis inhabits some species of sabella.

Sepia.—Body fleshy, receiving the breast in a sheath, with a tubular aperture at its base; arms 8, beset with numerous warts or suckers, and in most species 2 pedunculated tentacula; head short; eyes large; mouth resembling a parrot's beak.

The animal which inhabits the argonauta is considered by naturalists as belonging to this genus.

Clio.—Body oblong, natant, generally sheathed and furnished with two dilated membranaceous arms or wing-like processes; tentacula 3, besides 2 in the mouth.

According to some naturalists, it is an animal belonging to this genus, which inhabits the argonauta.

Terms employed in describing Shells.

Terms employed in describing Shells.

CHAP. III. OF THE TERMS WHICH ARE EMPLOYED IN DESCRIBING SHELLS.

16
Terms explained.

AS it will tend to facilitate our progress in the study of *Conchology*, clearly to understand the terms which are employed in describing shells, and the names by which the different parts have been distinguished by naturalists; we shall here give a few definitions of the principal terms. And that these definitions may be easily consulted, we shall observe the same order as in the classification which is to be adopted. They may be conveniently arranged, therefore, into the three divisions of multivalves, bivalves, and univalves.

1. Explanation of the Terms of Multivalve Shells.

17
Multi-valves.

MULTIVALVE shells are composed of more than two pieces.

Articulated (testæ articulatae), when the different pieces of which the shell is composed are so strongly united that they seem to form one shell.

Æquivalve shells (testæ æquivalves), when the valves of the two sides have the same form, size, and position.

A shell is said to *adhere* (testa adherens), when it is attached to solid bodies by some of the pieces of which it is composed: It is said to be *loose* (testa libera), when it is not attached by any point.

Pedunculated (testa pedunculata), when all the pieces of which it is composed, are supported by a tendinous peduncle which is fixed to solid bodies.

Tabular (testa tubulosa), when the greatest part of the shell is formed of a cylindrical tube.

Base of the shell (basis testæ), that part on which it is supported.

Ligament (ligamentum), is a membranous or tendinous substance which connects the valves together, and sometimes lines the cavity of the shells. Of this there are several varieties.

—— *scaly* (ligamentum squamatum), when the surface is covered with small granular scales.

—— *prickly* (ligamentum aculeatum), when the surface is furnished with small rough points.

—— *smooth* (ligamentum læve), when the surface has neither points, scales, nor tubercles.

—— *punctated* (ligamentum punctatum), when the surface is marked with small cavities.

Lid (operculum), is the name given to four small triangular valves articulated in the form of a cross, which shut up the superior orifice of some species of multivalve shells.

Peduncle (pedunculus) is the tendinous substance which supports some of the multivalve shells. It is flexible while the animal is alive, and is smooth or scaly.

Rays (radii); these are impressions on the external surface of some shells; they are of a conical form, having the vertex turned towards the base of the shell. They are only distinctly seen in adult shells.

—— *filiform* (radii filiformes) are long and narrow.

—— *smooth* (radii leves.)——

—— *striated* (radii transversim striati.)——

Valves (valvulae) are the different pieces of which multivalve shells are composed.

2. Explanation of the Terms applied to Bivalve Shells.

A BIVALVE shell is said to *adhere* (testa adherens), when it is fixed by any part of one of its valves to a solid body.

It is said to have *ears* (testa aurita), when it forms at its base, one or two compressed angles.

Gaping (testa hians), when the valves do not shut close.

Bearded (testa barbata), covered externally with an epidermis composed of strong hair or bristles.

Compressed (testa compressa), when the valves are flat, forming a small cavity.

Heart-shaped (testa cordata), having the form of a heart; (*subcordata*) approaching to that form.

Toothless (edentula), without teeth at the hinge.

Equilateral (testa æquilatera) when the anterior and posterior part of the shell is equal in form and figure.

Equivalve (æquivalvis), when the two valves are similar in form and convexity.

Irregular (testa irregularis), when the form varies in the individuals of the species.

Lenticular (lenticularis), when the valves are round, and little elevated in the middle, and diminish gradually in thickness towards the edges.

Linear (testa linearis), when the length considerably exceeds the breadth, but without a cylindrical form.

Tongue-shaped (linguiformis), flat and oblong, having the two extremities round and obtuse.

Boat-shaped (navicularis) resembling the figure of a boat.

Pectinated (pectinata), when the valves being furnished with longitudinal ribs, have on their anterior surface ribs nearly transverse which form by their union with the first acute angles.

Radiated (radiata), when it is marked on the external surface with rays, ribs, or elevated striæ, which proceed from the extremity of the summits, and terminate in the circumference of the valves.

Beaked (rostrata), when one of its surfaces, either anterior or posterior, being contracted and elongated, terminates in form of a beak.

Base (basis). The situation in which Linnæus has described and considered bivalve shells, consists in placing the beaks of the shell turned downwards, in such a way that the ligament of the valves may be seen, so that the base of the shell is the region of its beaks.

Margin of the shell (margo testæ) signifies the whole circumference of the shell, parallel to the edge of the valves. It is divided into anterior, posterior, and superior.

—— *anterior* (margo anterior), when the shell is placed on the beak of the valves, commences at the side of the ligament, on the fore-part of the

Terms employed in describing Shells.

mits, and extends to one third of the whole circumference of the valves,

Margin posterior (*margo posterior*), extends to one-third of the circumference from the beaks of the valves behind.

— superior (*margo superior*), includes the upper part of the circumference of the valves comprehended between the superior extremity of the anterior margin, and the superior extremity of the posterior margin. Hence the whole circumference of the shell is divided into 3 equal parts.

Margins of the valves (*margines valvularum*), signify the whole interior circumference of the valves, including about the breadth of a line of the outer edge. They are divided into

— furrowed (*margines canaliculati*), having on some part of the anterior circumference, a small gutter parallel to it.

— notched (*margines crenulati*), furnished interiorly with rounded notches.

— toothed (*margines dentati*), provided with pointed teeth.

— folded (*margines plicati*), furnished with folds which reciprocally correspond with those of the opposite valve.

— simple (*margines simplices*) having neither folds, teeth, nor notches.

— striated (*margines striati*), having longitudinal striæ.

Hinge. The hinge of a shell is the most solid and thickest part of the circumference of the valves, constituting their base. It is almost always furnished with teeth of different proportions, which serve to fix the valves together. The hinge is

— compressed (*cardo depressus*), formed of one compressed tooth.

— lateral (*cardo lateralis*), when it is placed at one of the sides of the shell.

— oblong (*cardo oblongus*), when it occupies the whole base of the shell.

— reflected (*cardo reflexus*), when its edges are folded back externally towards the convexity of the valves.

— terminal (*cardo terminalis*), situated at the inferior extremity of the shell.

— truncated (*cardo truncatus*), when the base of the shell terminates transversely and suddenly, and the teeth of the hinge are fixed in this part.

Teeth (*dentes*), are solid protuberances, commonly pointed, with which the hinge of shells is usually furnished, and which are destined to fix the two valves together. They are divided into.

— alternate (*dentes alternati*) when they are placed in a line parallel to the edges of the hinge; and when the teeth of one valve are received into the interstices of the teeth of the other valve.

— articulated (*dens insertus*), when it is received in a corresponding cavity at the opposite valve.

— forked (*dens duplicatus seu bifidus*), having the point divided into two.

— cardinal (*dens primarius seu cardinalis*), is the tooth which is placed immediately opposite.

— compressed (*dens depressus*), which is very much flattened.

Teeth erect (*dens erectus*), when the valve is laid on the convex side, the tooth rises perpendicularly.

— longitudinal (*dens longitudinalis*), when it extends like a rib on the base of the valves.

The *disk* (*discus*), signifies the convex centre of the valves, which is usually situated between the belly of the shell and its limb.

Limb (*limbus*) is the circumference of the valves from the disk to their edges.

Belly of the shell (*testæ umbo*), is the most inflated part of the valves.

It is vaulted (*umbo fornicatus*) when in the interior of the valves it exhibits a cavity separated from the hinge by a vertical membrane.

Nates signify two protuberances of a conical figure, somewhat spiral, which accompany the external base of most bivalve shells. They are

— flattened (*nates depressæ*), when the surface is sensibly compressed.

— approximate (*nates approximatae*) meeting together, when the shell is shut.

— horned (*nates corniformes*), when the angles being considerable, and their direction waved or spiral, they resemble a horn.

— bent (*nates incurvatæ*), when the curvature of the one is directed towards that of the other.

— separated (*nates distantes*), when they are separated from each other, at least the distance of a line.

— distant (*nates remotissimæ*), when the interval is very great.

— reflected (*nates recurvæ*), when the curvature is directed towards the posterior surface of the shell.

— wrinkled (*nates rugosæ*), when the surface is marked with unequal lines.

— spiral (*nates spirales*), when the curvature exhibits more than one circumvolution.

Vulva, is situated at the lower part of the anterior margin of the valves. It is divided into

— hollowed (*excisa, seu canaliculata*), when it is marked with a groove during its whole length.

— distinct (*distincta*), marked by a perceptible difference of colour.

— lettered (*scripta seu literata*), when the surface is marked with lines resembling written characters.

— inflected (*inflexa*), when the edge of the lips is bent towards the inner surface of the valves.

Anus, signifies an impression usually hollow, placed at the lower part of the posterior surface. It is divided into.

— bordered (*marginatus*), when it is circumscribed by a distinct elevation.

— heart-shaped (*cordatus*), exhibiting the form of a heart.

— toothed (*dentatus*), furnished with teeth or notches.

— lanceolated (*lanceolatus*), when the length is greater than the breadth, and the extremities are pointed.

— open (*patulus seu hians*), forming by the separation of its edges, a considerable opening, which penetrates into the interior of the shell.

— oval (*ovatus*), of an elliptical figure.

Terms employed in describing Shells.

Valves,

Terms employed in describing Shells.

Terms employed in describing Shells.

Valves, of bivalve shells, are divided into right and left, equal and unequal, equilateral and inequilateral, superior and inferior.

— right valve (*dextra*), is distinguished from the left, by placing the shell on its base, having the cardinal ligament before, and the anus behind. In this position the right valve of the shell corresponds to the left of the observer, and the left valve (*sinistra*) to the right of the observer.

— equal (*equales*), when the right valve corresponds with the left in form, size, and other external characters.

— superior (*valvula superior*). In an irregular shell, such as the oyster, one of the valves is attached to solid bodies; the other in this case is superior. This valve is sometimes called by Linnæus, the lid (*operculum*): in some species it is flat and small, and in others more convex than the inferior valve.

— keel-shaped (*valvulæ carinatæ*), when one part of their convexity presents a sharp edge.

— chambered (*concameratæ*), when they exhibit in their cavity testaceous plates, detached and raised.

— spinous (*spinosæ*), when the whole surface is furnished with spines.

— banded (*fasciatæ*), exhibiting large coloured transverse stripes or bands.

— lamellated (*lamellosæ*), when the surface is furnished with plates more or less separated.

— radiated (*radiatæ*), exhibiting divergent or coloured rays.

— sinuated (*lacunosæ*), when one of the valves has a sensible depression at the middle of its margin, and a corresponding elevation of the opposite valve.

— striated (*striatæ*) when the surface is marked with striæ.

— transverse, when the striæ are parallel to the margin of the valves.

— longitudinal, when they run from the base to the circumference.

Muscular impressions (*impressiones*), are marks on the interior surface of the valves, where the muscles of the animal are attached.

— solitary (*solitariæ*), when the inner surface of each valve has only one.

— double (*duplicatæ*), two on the inner surface of each valve.

— triple or ternate (*ternatæ*), three in each valve.

Ligament (*ligamentum*), is a horny substance, of little flexibility, which unites the two valves near their base, and which in almost all bivalve shells is placed at the lower part of their anterior surface. It is divided into.

— gaping (*hians*), when its upper extremity is divided into two.

— double (*duplex*), when under the external ligament there appears a second, in a particular hollow of the hinge, which does not appear externally.

— internal (*internal*), when it unites the valves without appearing externally.

— profound (*retractum seu intractum*) when it is so deep in the future as scarcely to be seen when the valves are shut.

— truncated (*truncatum*) when shorter than its future.

Furrows (*falci*), are those impressions or interstices between the ribs or rays on the surface of the valves.

— square (*quadrati*), when the bottom is flat.

— lamellated (*lamellofi*), when the bottom is marked with small transverse scales.

— punctated (*excavato punctati*), when the whole surface is marked with small cavities or dots.

3. *Explanation of Terms applied to Univalve Shells.*

The *base*, (*basis*) is the most elevated part of the shell, opposite to the *spire*. It is divided into

— notched (*emarginata*), when it is accompanied with a deep notch.

— tubular (*tubulosa seu cordata*), when it is formed by a tube.

— simple or entire (*simplex aut integra*), without notch or tube.

Summit (*vertex*) signifies the top of some patellæ, and from its position is central, marginal, or submarginal.

The *shell* (*testa*) is divided with regard to its position into superior and inferior.

The *anterior part* (*pars antica*), is that which forms the spire of the shell; and it is also the superior part.

The form of shells is

— bordered (*marginata*), when the two sides of the opening are broader and thicker than the rest of the diameter.

— chambered (*polythalamia*), when it is internally divided by different partitions parallel to the opening.

— convoluted (*convoluta*), when the spires turn round a lengthened cone, nearly vertical to each other.

— rooted (*radicata*), when it is attached to a solid body by a ligament proceeding from its base.

— interrupted (*interrupta*), when the successive additions to the shell are marked with distinct rings.

— umbilicated (*umbilicata*), when the axis round which the sphere turns, being empty, forms a cavity at the base of the shell, whose diameter is at least a sixth part of that of the shell.

— imperforated (*imperforata seu exumbilicata*), when its inferior axis has neither hole nor umbilicus.

— oval or elliptic (*ovales*), the longitudinal diameter exceeding the transverse, and the two extremities equal and a little contracted.

— egg-shaped (*ovata*), the longitudinal diameter exceeding the transverse, and the extremities terminated by the segment of a circle.

— beaked (*rostrata*), when the two extremities, sometimes tubular, form a projection in form of a beak.

— imbricated (*imbricata*), when the surface is covered with parallel scales, so arranged as to cover each other.

— turbinated (*turbinata*), when the belly of the shell is large in proportion to the spires, which seem to proceed from its center.

Opening

Terms employed in describing Shells.

Opening or moub (apertura), is that part of the cavity of the shell which is visible. It is

— angular (angulata), when its circumference has several angles.

— gaping (dehiscens), when one of the extremities is wider than the other.

— bimarginated (bimarginata), when the right lip forms a double margin.

— compressed (coarctata), when it is distinctly flattened.

— semicircular (semiorbiculata), when it forms half a circle.

— linear (linearis), when it is narrow, and the length considerably exceeds the breadth.

— longitudinal (longitudinalis), when the length is greater than the breadth, and the greatest dimension is parallel to the axis of the shell.

— orbicular (orbicularis), forming an entire circle.

— striated (striata), when the cavity is marked with striæ, parallel to the direction of the convolutions.

— transverse (transversa), when the breadth is greater than the length.

Pillar (columella), is that part of the shell situated within the opening, near its axis, round which the spires turn. It is brought into view by dividing the shell its whole length. It is

— flattened (plana), when the surface is flat and smooth.

— caudated (caudata), when it is lengthened beyond the base of the shell.

— folded (plicata), marked with transverse and distinct folds.

— spiral (spiralis), proceeding from the base, and forming a small, twisted elongation.

— truncated (truncata), cut transversely at the base.

Convolutions (anfractus), are the turnings of the spire round the pillar, from the opening to the base of the shell. They are

— bifid (bifidi), when each is divided into two equal parts by a furrow or spiral line.

— grooved (canaliculati), when the superior edge is marked with a groove.

— keel-shaped (carinati), when the outer turn of the shell is marked with an angle more or less acute.

— crowned (coronati), when the upper surface is bordered at a little distance from the sutures, with a single row of tubercles or spinous scales.

— dextral (dextri), turning from the left to the right.

— sinistral (sinistri), turning from the right to the left.

— lettered (scripti), marked with characters.

— spinous (spinosi), having short spines on the surface.

— entire (simplices), without furrows or tubercles.

— banded (fasciati), when the surface is marked with broad coloured stripes.

— lamellated (lamellati), the surface marked with longitudinal or transverse excrescences, and laminated like membranes.

— lineated (lineati), marked with coloured lines.

— radiated (spinoso-radiati), having the circumference bordered with straight spines, separating and divergent.

— separated (disjuncti), having an interval between each convolution.

— furrowed (fulcati), having the surface marked with furrows, which are always broader than striæ.

— decussated (decussati), when the striæ cross each other at right angles.

Spire (spira), signifies all the convolutions taken together. It is

— pointed (acuta), when the convolutions joined together form an acute angle.

— flattened (depressa), forming a flat surface.

— convex (convexa), when it is rounded, and the point of the base has little elevation.

— convex (convexo-acuta), rounded at the outer edge, but elevated into an acute angle.

— convex and elevated (convexo-exserta), rounded at the outer edge, and elevated without forming an acute angle.

— convex and pointed (convexo-mucronata), obtuse and almost rounded at the outer edge, and terminated at the center with a pointed elevation.

— crowned (coronata), when the outer edges of each convolution are accompanied with a row of spines or tubercles.

— capitate (capitata), the convolutions united, forming a swelling resembling a head.

— obtuse (obtusa), the convolutions united, forming an obtuse angle.

— plano-concave (plano-concava), the convolutions forming no elevation, but are slightly grooved.

— pyramidal (pyramidata), of a conical form.

Sutures (futurae), signify the place of junction of the different convolutions, forming a spiral line. They are

— grooved (canaliculatae), when they are so deep as to form a small canal.

— notched (crenulatae), when the points of contact are marked with notches.

— double (duplicatae), accompanied with two striæ, which run parallel.

— effaced (obsoletae), when the place of junction is not perceptible.

Siphon (siphon), is a small canal situated in the internal part of the shell of the nautili, which penetrates into the divisions of which it is composed. It is

— central (centralis), when it is situated in the middle of the divisions.

— lateral (lateralis), situated at one side.

— oblique (obliquus), cutting the axis of the divisions obliquely.

Veins (varices) are elevations or ribs, running in the direction of the length of the shell, formed by the junction of the different additions which the shell has received. They cut the convolutions of the spire transversely. They are

— continued (continuatae), proceeding from the base of the spire to the convolution at the opening, without interruption.

— spinous (spinosae), furnished with strong spines.

— interrupted (decussatae), not corresponding with the different convolutions.

Terms employed in describing Shells.

CHAP. IV. CLASSIFICATION OF SHELLS.

20
Classifica-
tion.

SHELLS are divided by Linnæus into multivalve, bivalve, and univalve. In the following classification the same arrangement will be adopted; and we shall first exhibit in one view the characters of each genus, in the original language of Linnæus, with a translation opposite, for the sake of the English reader; so that the genus of any shell may be easily determined. In

describing the species, we shall observe the utmost brevity, giving such characters only as are necessary to afford precise marks of distinction. In arranging the species under each genus, the British species will be distinguished with an asterisk; so that, with the advantage of a general classification, this will answer the purpose of a British conchology.

GENERIC CHARACTERS.

I. MULTIVALVE SHELLS.

21
Generic
character
of multi-
valves.

1. CHITON. Animal doris. Testæ plures, secundum longitudinem sibi appositæ dorso incumbentes.
2. LEPAS. Animal triton. Testa basi affixa multivalvis: valvis inæqualibus erectis.
3. PHOLAS. Animal ascidia. Testa bivalvis divaricata, cum minoribus accessoriis difformibus: cardo recurvatus cartilagine connexus.

1. C. Animal inhabiting the shell a doris. Shell consisting of several segments or valves disposed down the back.
2. L. Animal a triton. Shell affixed at the base, and consisting of many unequal erect valves.
3. P. Animal an ascidia. Shell bivalve, divaricate, differently shaped; accessory valves: hinges bent back, united by a cartilage: beneath the hinge internally, is an incurved tooth.

II. BIVALVE SHELLS.

22
Of bivalves.

4. MYA. Animal ascidia. Testa bivalvis hians, ut plurimum, altera extremitate: cardo dente (plerisque uno) solido, crasso, patulo, vacuo; nec inserto testæ appositæ.
5. SOLEM. Animal ascidia. Testa bivalvis oblonga, utroque latere hians. Cardo dens subulatus reflexus, sæpe duplex, non insertus testæ appositæ, margo lateralis magis obsoletus.
6. TELLINA. Animal tethys. Testa bivalvis, antè hinc ad alterum latus flexa. Cardinis dentes ut plurimum tres: laterales plani alterius testæ.
7. CARDIUM. Animal tethys. Testa bivalvis subæquilatera, æquivalvis plerumque convexa, longitudinaliter costata, striata aut fulcata, margine dentata. Cardo dentibus mediis binis alternatis: altero ut plurimum incurvo; lateralibus remotis insertis.
8. MACTRA. Animal tethys. Testa bivalvis, inæquilatera, æquivalvis. Cardo dente medio complicato cum adjecta foveola, lateralibus remotis insertis.
9. DONAX. Animal tethys. Testa bivalvis, margine sæpe crenulato antico obtusissimo. Cardo dentibus duobus; marginalique solitario (rarius duplici, triplice, aut nullo) subremoto sub ano.
10. VENUS. Animal tethys. Testa bivalvis; labiis margine antico incumbentibus. Cardo dentibus tribus, omnibus approximatis, lateralibus apice divergentibus.

4. M. Animal an ascidia. Shell bivalve, generally gaping at one end. Hinge with broad, thick, strong teeth (seldom more than one), and not inserted into the opposite valve.
5. S. Animal an ascidia. Shell bivalve, oblong, open at both ends. Hinge with a subulate, reflected tooth, often double, and not inserted in the opposite valve, the lateral margin more effaced.
6. T. Animal a tethys. Shell bivalve, generally sloping on one side, in the fore part of one valve a convex, of the other a concave fold. Hinge usually with three teeth: the lateral ones in one shell being smooth.
7. C. Animal a tethys. Shell bivalve, nearly equilateral, æquivalve, generally convex, longitudinally ribbed, striated or grooved, with a toothed margin. Hinge with two teeth near the beak, and a larger remote lateral one on each side, each locking into the opposite.
8. M. Animal a tethys. Shell bivalve, of unequal sides, and æquivalve. Middle tooth of the hinge complicated, with a small hollow on each side, lateral ones remote and inserted into each other.
9. D. Animal a tethys. Shell bivalve, generally with a notched margin: the frontal margin very obtuse. Hinge with two teeth, and a single marginal one placed behind (rarely double, triple, or none).
10. V. Animal a tethys. Shell bivalve; the frontal margin flattened with incumbent lips. Hinge with three teeth, all approximate; the lateral ones divergent at the tip.

Classifica-
tion of
Shells.

Classifica-
tion of
Shells.

11. SPONDYLUS. Animal tethys. Testa inæquivalvis rigida. Cardo dentibus duobus recurvis, cum foveola intermedia.

12. CHAMA. Animal tethys. Testa bivalvis crassior, cardo callo gibbo, oblique inferto fossulæ obliquæ.

13. ARCA. Animal tethys? Testa bivalvis æquivalvis. Cardo dentibus numerosis, acutis alternis infertis.

14. OSTREA. Animal tethys. Testa bivalvis (plurimis inæquivalvis subaurita. Cardo edentulus, fossula cava, ovata, fulcisque (in plurimis) lateralibus transversis.

15. ANOMIA. Animal corpus ligula emarginata ciliata: ciliis valvæ superiori affixis: brachiis duobus linearibus corpore longioribus conniventibus porrectis, valvæ alternis utrinque ciliatis: ciliis affixis valvæ utriusque: testa inæquivalvis, valva altera planiuscula, altera basi magis gibba: parum altera basi sæpe perforata. Cardo cicatricula lineari prominente introrsum dente laterali; valvæ vero planioris in ipso margine. Radii duo offei pro basi animalis.

16. MYTILUS. Animal ascidia? Testa bivalvis, rudis, sæpius affixa bysso, ut plurimum, crassiori. Cardo in plurimis edentulus, distinctus, paucis exceptis, linea subulata, excavata longitudinali.

17. PINNA. Animal limax. Testa sub-bivalvis fragilis, erecta hians, emittens barbam byssinam. Cardo edentulus, coalitis in unam valvis.

11. S. Animal a tethys. Shell hard, solid, with unequal valves. Hinge with two recurved teeth, separated by a small cavity.

12. C. Animal a tethys. Shell bivalve, rather coarse. Hinge with a callous protuberance, obliquely inferted in an oblique hollow.

13. A. Animal a tethys? Shell bivalve equi-valve. Hinge with numerous sharp teeth, alternately inferted between each other.

14. O. Animal a tethys. Shell bivalve, generally with unequal valves, and slightly eared. Hinge without teeth, but furnished with an ovate cavity, and in most with lateral, transverse furrows.

15. A. Animal an emarginate, ciliated, strap-shaped body, with bristles attached to the upper valve; arms two, linear, longer than the body, projecting and approaching together, alternate on the valve, and ciliated on each side, with bristles affixed to each valve. Shell inequivalve, one of the valves flattish, the other protuberant at the base: one of the valves often perforated near the base. Hinge with a linear prominent cicatrix, and a lateral tooth placed within; but on the very margin of the flat valve there are two bony rays for the base of the animal.

16. M. Animal an ascidia? Shell bivalve, rough, generally affixed by a byssus or beard of silky filaments. Hinge mostly without teeth, and in most cases with a subulate, hollow, longitudinal line.

17. P. Animal a limax. Shell bivalve, brittle, gaping at one end, and having a byssus or beard. Hinge without teeth, the valves being united into one.

III. UNIVALVE SHELLS.

²³
Univalves.

18. ARGONAUTA. Animal sepia aut clio. Testa univalvis, spiralis, involuta, membranacea, unilocularis.

19. NAUTILUS. Animal? Testa univalvis, isthmis perforatis concamerata, polythalamia.

20. CONUS. Animal limax. Testa univalvis convoluta, turbinata; apertura effusa, longitudinalis, linearis, edentula, basi integra; columella levis.

21. CYPRÆA. Animal limax. Testa univalvis, involuta, sub-ovata, obtusa, lævis. Apertura utrinque effusa, linearis utrinque dentata longitudinalis.

22. BULLA. Animal limax. Testa univalvis convoluta, inermis. Apertura sub-coarctata, oblonga, longitudinalis, basi integerrima. Columella obliqua, lævis.

23. VOLUTA. Animal limax. Testa unilocularis spiralis. Apertura ecaudata, sub-effusa. Columella plicata: labio umbilicove (ut plurimum) nullo.

24. BUCCINUM. Animal limax. Testa univalvis, spiralis, gibbosa. Apertura ovata desinens in canaliculum (retusam lacunam) dextrum, cauda retusa. Labium interius explanatum.

25. STROMBUS. Animal limax. Testa univalvis, spiralis, latere ampliata. Apertura labro sæpius dilatato, desinens in canalem sinistrum.

26. MUREX. Animal limax. Testa univalvis, spiralis, exasperata futuris membranaceis. Apertura defi-

18. A. Animal a sepia or clio. Shell univalve, spiral, involute, membranaceous, one cell.

19. N. Animal? Shell univalve, divided into several chambers communicating with each other.

20. C. Animal a limax. Shell univalve, convolute, turbinate; aperture effuse, longitudinal, linear, without teeth; entire at the base. Pillar smooth.

21. C. Animal a slug. Shell univalve, involute, subovate, smooth, obtuse. Aperture effuse at each end, linear, extending the whole length of the shell, and toothed on each side.

22. B. Animal a limax. Shell univalve, convolute, without teeth. Aperture a little narrowed, oblong, longitudinal, quite entire at the base. Pillar oblique and smooth.

23. V. Animal a limax. Shell one cell, spiral. Aperture without a beak, and somewhat effuse. Pillar twisted or plaited: generally without lips or perforation.

24. B. Animal a limax. Shell univalve, spiral, gibbous. Aperture ovate, ending in a short canal, leaning to the right, with a retuse beak. Internal or pillar lip expanded.

25. S. Animal a limax. Shell univalve, spiral, enlarged at the side. Aperture dilated with the lip expanding, and ending in a groove towards the left.

26. M. Animal a limax. Shell univalve, spiral, rough, with membranaceous futures. Aperture oval,

Section 1. The purpose of this document is to provide a comprehensive overview of the project's objectives and scope.

Section 2. The project is designed to address the current challenges faced by the organization in the market.

Section 3. The primary goal is to increase operational efficiency and reduce costs across all departments.

Section 4. This will be achieved through the implementation of a new software system and the restructuring of workflows.

Section 5. The project timeline is set for completion by the end of the fiscal year, with regular progress reports.

Section 6. A dedicated team has been assigned to manage the project, with clear roles and responsibilities.

Section 7. The budget for this project is allocated from the general operating funds, with strict adherence to financial controls.

Section 8. The success of the project will be measured by key performance indicators (KPIs) such as cost savings and productivity gains.

SECTION 9: CONCLUSION

Section 9. In conclusion, the project is a strategic initiative that is essential for the organization's long-term growth.

Section 10. It is expected that the implementation of the project will result in significant improvements in performance.

Section 11. The project team is committed to ensuring a smooth transition and minimizing any disruption to operations.

Section 12. The project is subject to regular review and adjustment based on changing circumstances.

Section 13. The project is a high-priority initiative that requires the full support and cooperation of all staff.

Section 14. The project is a key component of the organization's strategic plan and is being closely monitored.

Section 15. The project is a critical path item and is being managed with the highest level of attention.

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