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# EXOTIC MINERALOGY:

OR,  
*COLOURED FIGURES*  
OF  
FOREIGN MINERALS,  
AS A  
SUPPLEMENT  
TO  
BRITISH MINERALOGY.

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VOL. II.

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DESIGNER OF ENGLISH BOTANY AND EXOTIC BOTANY, AUTHOR  
OF ENGLISH FUNGI, THE BRITISH MISCELLANY, NEW ELU-  
CIDATION OF COLOURS, MINERAL CONCHOLOGY,  
A BOTANICAL DRAWING BOOK, ETC.

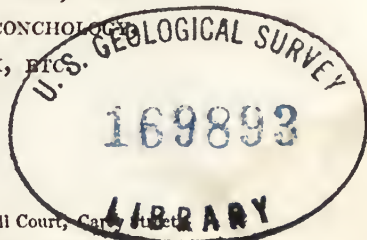
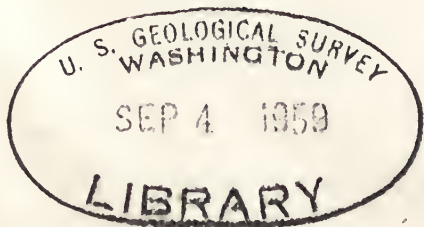
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MDCCCXVII.



DIS 26

ERRATA.

Preface to Vol. I. p. 1, line 4 from the bottom, for 'supersede' read 'supersedes.'

## *PREFACE.*

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It was under the impression that about 100 plates of Minerals not known in Great Britain would have been a sufficient Appendix to British Mineralogy, for the student, that I commenced this work ; but since 1811 so many new species and strongly marked varieties have crowded upon me, and so anxious have my friends been to see every thing extraordinary commemorated, that after the completion of 100 figures I still find many species not even noticed in either work ; the probability therefore is, that it may be necessary to double that number, which I do not hesitate to do, knowing that the work must be proportionally more complete. For the sake of convenience I divide it into two volumes ; but as that will probably be the utmost extent, I shall reserve the Index for the second.

I trust that, the utility of the work having been acknowledged by the reception the first volume has met with, the subjects contained in the second will render it equally interesting, and make the extension acceptable.

JAMES SOWERBY.

2, MEAD PLACE,  
1817.







## TAB. LXXIV.

SODA sulphata magnesifera.

*Magnesian Sulphate of Soda.*

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**I**N British Mineralogy I have had the pleasure of giving the figure and locality of the Satin Spar, which is likely to be lost to posterity except in the figure. This salt, with a so singularly beautiful satiny lustre, puts me in mind of it;—how far it may be permanently preserved I do not know; it however is likely to be possessed but by few except in the figure; we are therefore thankful for an opportunity of publishing it by favour of Mr. Heüland, in whose valuable collection the specimen is to be placed. It is from Calatayud in Arragon.

The same salt is found crystallized in flat six-sided prisms, and as a mealy efflorescence of a snow-white and yellowish white, in the country around Sedlitz and Saidsechutz, and also at Pilln near Brün, and named Reussite. See Jameson's Syst. of Mineralogy, ed. 2. Vol. I. p. 319.









## TAB. LXXV.

## MAGNESIA hydrata.

*Hydrate of Magnesia.*

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SYN. Native Magnesia. *Bruce in American Min. Journal* 1. 26.

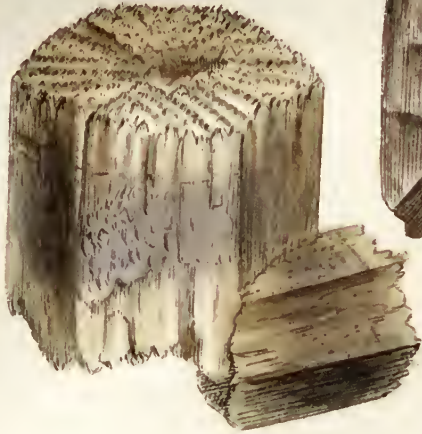
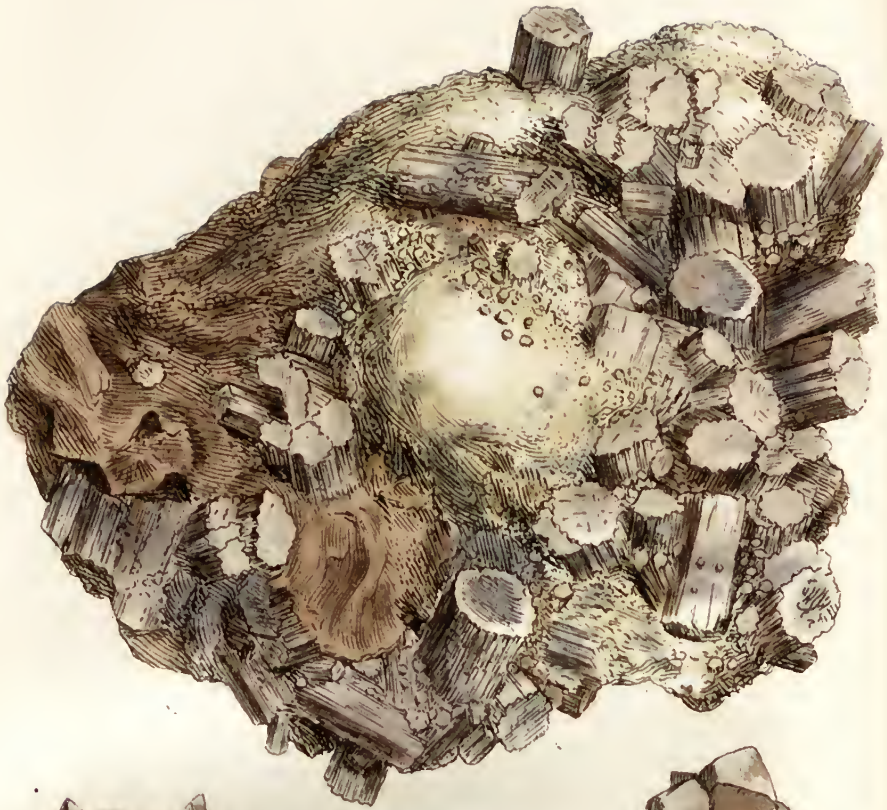
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THIS mineral was discovered forming veins in Serpentine at Hoboken in New Jersey, by Dr. Bruce of New York. It somewhat resembles Tale, but has more transparency; it is soft enough to yield to the pressure of the finger nail, but feels harsh to it when compared with Tale: by exposure to the air it loses a great part of its pearly lustre: its solubility in acids at once distinguishes it.

The free access every scientific person is allowed to the British Museum, and the polite attention of the Professors there, has enabled me to procure drawings of many choice minerals for publication, among which is the present, presented to the Museum by the discoverer.







## TAB. LXXVI.

## CALX arragonensis.

*Arragonite.*


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SYN. Arragonite. *Haiiy, Traité 4. 337. Tabl. 6.*  
*Bournon Traité de la Chaux*  
*carbonatée 2. 119.*

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THE varieties of Arragonite, figured in British Mineralogy, tab. 147, are externally very different in appearance from that one from which the species derives its name, and which I here figure: the crystals are hexahedral prisms produced by the grouping of several tetrahedral ones: two varieties of these have been fully explained by the Count de Bournon, in his elaborate work upon Carbonate of Lime. The small crossed crystals I have shown at the bottom of the plate, some of which are selected from the Count's collection, partly illustrate the most common kind of compounded hexahedral prisms, having four angles of  $117^{\circ} 2'$  and the other two of  $125^{\circ} 56'$ . The Count's explanation of these corresponds nearly with that given by Haiiy: it is very probable that there are several other prisms produced by various arrangements of the rhomboidal prisms. Haiiy describes one composed of four, according to him it has three angles of  $128^{\circ}$  ( $125^{\circ} 56'$  of Bournon) two of  $116^{\circ}$  (corresponding with the obtuse angles of the primitive or  $117^{\circ} 2'$  of Bournon) and one differing from all the others, being  $104^{\circ}$ . Bournon describes one composed

of three primitive prisms, modified so as to meet together and produce three angles of  $122^{\circ} 58'$ , leaving the other three primitive or  $117^{\circ} 2'$ : this cannot be referred to Haüy's, but I conceive that if angles taken from the concave faces of which these aggregates are composed, could be relied upon, several other compounds would be found. I have given a rough sketch of a white one composed of five very irregularly arranged, but yet producing an hexahedral prism, tolerably neat for a part of its length: this is taken from among a number of others upon a matrix of common Carbonate of Lime, with Grey Silver, Galena, and Copper pyrites, from the Leogang, Salzburg, in the Tyrol. The other specimens are from Molina, in the kingdom of Arragon, Spain, where the substance is abundant, imbedded in Clay, and frequently attached to masses of amorphous Gypsum: minute opaque red crystals of Quartz are often partly imbedded in the crystals of Arragonite. The three upper specimens are from Mr. Heüland's, late Mr. Forster's, splendid collection.

Since his *Traité de Mineralogie*, Haüy has considered a rectangular octohedron (three such compose the middle right hand figure) two of whose faces meet over the base at  $115^{\circ} 56'$  and two others at  $109^{\circ} 28'$  (the terminal ones in the figure) as the primitive: but Bournon thinks it to be a prism of  $117^{\circ} 2'$ , differing  $1^{\circ} 6'$  from two of the faces of Haüy's primitive and parallel to which indications of laminæ often occur; but the other faces of the octohedron he considers secondary.

Analysis by Stromeyer.

Carbonate of Lime . . .	94.5757
Carbonate of Strontian . .	3.9662
Hydrate of Iron . . . . .	0.7060
Water of crystallization .	0.3000

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99.5479







## TAB. LXXVII.

## CALX Gehleni.

*Gehlenite.*

SYN. Gehlenite. *Prof. Fuchs in Schweigger's Journal*, xv. 377.  
*Thomson's Annals*, ix. 71.

THIS new mineral is so different in its characters from any other, and they are so easily represented in the figure, that there can be no difficulty in recognizing it. Its crystals appear to be primitive: they are short rectangular prisms, which may be fractured in directions parallel to their sides; indications of laminae may also be discovered parallel to their base: the edges of the crystals are rounded, and their surface uneven, as if they had been subjected to the action of some solvent: the internal lustre is dull waxy, and the cross fracture uneven: it is hard enough to scratch glass. Spec. Grav. 2.98.

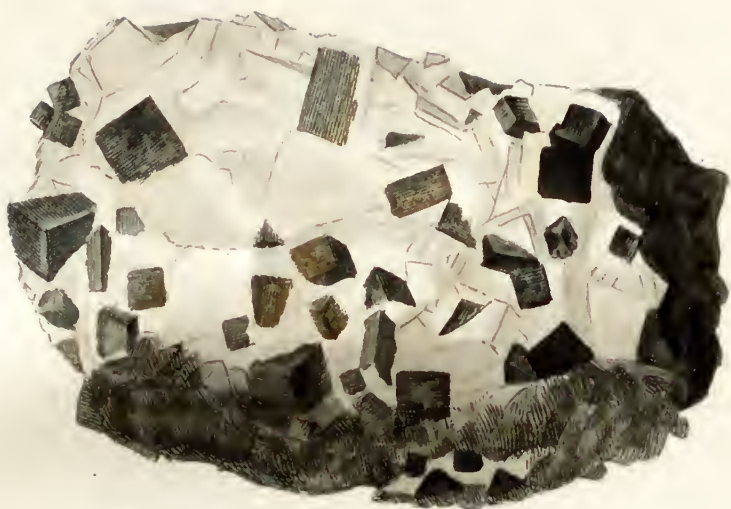
Mr. Heiland received the specimen here figured from Salzburgh, and through his liberality I am enabled to make it public. It is accompanied by Carbonate of Lime, with strong diagonal striae, such as belongs to the Trap rocks.

Analysis by Prof. Fuchs.

Lime . . . . .	35.30
Silex . . . . .	29.64
Alumine . . . . .	24.80
Oxyde of Iron . . . . .	6.56
Water . . . . .	3.30
	<hr/>
	99.60
	<hr/>







## TAB. LXXVIII.

## SILEX Bergmanni.

*Bergmannite.*


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SYN. Bergmannite. *Haiiy Tabl. 59.*

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**T**HIS mineral has been considered by some as a variety of Scapolite, tab. 68: it is so compact that the structure of its fibres cannot be discovered; its fusibility into a white enamel and some of its other characters agree with those of Scapolite, but several of our best mineralogists still class them separate. The specimen figured is in the British Museum; it is from Friedrichswärn in Norway; the Feldspar accompanying it is chatoyant.

Another specimen, lent me for examination by Mr. Heüland, who received it from Norway under the name Spreüstein, shows some minute fasciculi of acicular crystals, which under the magnifying glass appear to be hexahedral prisms, two of the angles of which are nearly rectangular, and two of their terminal edges more or less deeply replaced by a single face each placed at a very obtuse angle upon the side of the prism.

A specimen purchased at the sale of Dr. Lettsom's minerals is marked "from Homerberg, in the parish of Kylling, near Stavern, Norway," has also some minute crystals of a similar form upon it.









TAB. LXXIX.  
YENITE.

SYN. *Lievrit.* *Werner.*

I AM happy in being enabled to present figures of perfectly crystallized Yenite, which I had to regret not having seen when I published the scopiform variety in tab. 29. I am indebted to the liberality of the Countess of Aylesford for the loan of the upper tender specimen: its matrix is acicular Epidote, accompanied by a little Quartz in minute crystals upon the surface: the lower specimen, showing two larger crystals upon the same matrix, was lent me by Mr. Heüland; they are both from Rio la Marine in the island of Elba. Half of one of the crystals of the lower specimen has been broken off for Haüy to examine, and the measures given by that able crystallographer in his Tableaux are as follow: the angles of the prism  $112^{\circ} 36'$  and  $67^{\circ} 24'$ , and the incidence of the four triangular terminal faces upon it  $128^{\circ} 29'$ ; the prism, however, is so much modified by triangular faces, that it approaches a rectangular one in appearance, or one of about  $97^{\circ}$  and  $83^{\circ}$ .

It is strongly suspected, even by Le Lievre, that what he called a scopiform variety, which I have figured at tab. 29. is a variety of Epidote mixed with more Iron than usual; and Bournon's observation that it is transparent, and that the black appearance arises from the intensity of the green colour, favours this opinion; for the genuine crystals seem to be perfectly opaque and black. The specific gravity of a small piece of the scopiform variety in well defined square prisms, which I have examined, was only 3.000, while that of the crystals rises as high as 4.061: it is to be hoped, that when a greater supply is obtained this question will be clearly settled.







## TAB. LXXX.

## ARGILLA TOPAZIUS, var.

*Pyrophysalite.*

SYN. Pyrophysalith. *Hisenger and Berzelius, Bournon Catal. 44.*

Silice fluatée alumineuse prismatoïde. *Haüy Tabl. 18.*

Topaz ( $\alpha$ ) pyrophysalite. *Aikin 191.*

VARIOUS have been the opinions respecting the identity of Topaz, Pycnite, and Pyrophysalite: Haüy considers the two latter as varieties of the former; other eminent mineralogists have considered them all distinct species; Bournon looks upon Pyrophysalite and Pycnite as varieties, but distinct from Topaz; unfortunately the analyses of Topaz have differed so much from each other, that a difference in the proportions of the constituent parts did not appear sufficient to constitute a distinguishing character, while their physical characters might justly be supposed to vary according to the more or less perfect union of the particles or the purity of the substance. The Pyrophysalite lies between Topaz and Pycnite approaching in form to the crystal of Topaz and in opacity and softness to Pycnite. From some recent analyses by Berzelius it appears that Topaz and Pyrophysalite agree very nearly in the proportion of their constituents, while Pycnite contains less alumine, and may therefore be considered as another species; but Pyrophysalite resembling Topaz in its analysis, in the form

of its crystal, and in possessing the laminated structure peculiar to it, must be considered as a variety of the same species. They bear the same relation to each other as the Emerald or Beryl that accompanies the Pyrophyssalite does to the Beryl of Siberia, found with the Topaz. The same circumstances have probably contributed to the opacity or imperfection, if I may so say, of the two minerals.

The back figure exhibits the irregular elongated form in which the Pyrophyssalite generally penetrates the granite of Finbo; it is covered with Mica, partly foliated, and partly so compact as to resemble Serpentine. The granite contains a peculiar variety of Feldspar, composed of radiating laminae. The front figure is from a fragment of a very large prism; in some parts it is semi-transparent: I much regret that so large a crystal should have been broken. The upper figure is taken from the end of a crystal remarkable for the regularity of its form, and instructive, from the resemblance it bears to Topaz, which is particularly manifested in the modifications upon the prism. This valuable specimen was lent me by H. J. Brooke, Esq. Secretary to the Geological Society.

The following is the analysis of Pyrophyssalite by Prof. Berzelius, compared with the Brazilian and Saxon Topazes and the Pycnite.\*

	Alumine.	Silex.	Fluoric acid.	Total.
Pyrophyssalite . . .	57.74	34.36	7.77	99.87
Brazilian Topaz . . .	58.38	34.01	7.79	100.18
Saxon Topaz . . .	57.45	34.24	7.75	99.44
Pycnite . . . . .	51.00	38.43	8.84	98.27

As these analyses agree very nearly with the atomic theory they must approach closely to perfection, and Pycnite† must be a distinct species.

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\* See Thompson's Annals ix. 76.

† Exotic Mineralogy, tab. 31.







## TAB. LXXXI.

CALX Scheelata.

*Scheelate of Lime.*

SYN. Wolfram de couleur blanche. *Romé D' Lisle*  
iii. 264.

Tungsten. *Kirwan* ii. 314.

Scheelin calcaire. *Haüy Traité* iv. 320.  
*Tabl.* 118. *Bournon Catal.* 438.

Schwerstein. *Werner.*

Tungstate of Lime. *Thoms. Syst. Chem.*  
*ed.* 3. iv. 543.

**T**UNGSTATE of Lime is one of those minerals that had long been known before its real nature was understood: thus it had passed for a white ore of Tin, an ore of Iron, &c. when Scheele discovered the new metal it contains in the state of oxide combined with Lime. Its weight and its frequently accompanying Tin ores led to its being confounded with them, but its softness and inferior lustre readily distinguishes it.

It seldom occurs massive, although it is sometimes found in large masses of more or less perfect crystals, but is generally dispersed in small crystals, which are often collected in globose groups, upon the surface of Quartz crystals or Mica in large hexahedral plates: sometimes it is dispersed through masses composed of Tin, Quartz, Chlorite, &c. the form of the crystals is most commonly that of an octohedron, approaching nearly to a regular one, its angles being  $107^{\circ}26'$  and  $113^{\circ}36'$ ; but the primitive is according to Bournon and Haüy, an acute

octohedron, of which the angle of incidence of one pyramid on the other is  $130^{\circ}20'$ ; laminae are easily discernable parallel to both the octohedrons, but those parallel to the latter are the most brilliant, and are therefore adopted for indications of the primitive, the others may arise from concentric coats upon small crystals. Haiiy formerly described the fractures, leading to the primitive, as parallel to the faces of a cube, with which, at first sight they appear to coincide, when they are not very regular, and only some of them are visible.

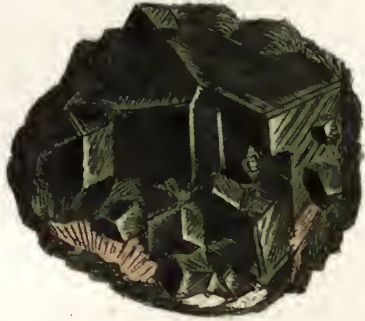
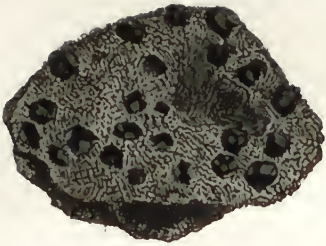
The specimen copied in the lower figure, is preserved in the British Museum, it is from Schönfeld, in Bohemia; the other figure exhibits the more common appearance in small octohedrons upon quartz. The outlines shew on one hand the primitive, and on the other the secondary octohedron, with small remains of the primitive upon its edges, and a modification between them. The cube within shews the direction of the fracture formerly attributed to it by Haiiy.

Scheelate of Lime was found by Klaproth to contain,

	From Schlackenwald.	From Cornwall.
Acid of Scheelium . . . . .	77.75	75.25
Lime . . . . .	17.60	18.70
Silex . . . . .	3.00	1.56
Oxyde of Iron . . . . .		1.25
Oxyde of Manganese . . . . .		0.75
	<hr/>	<hr/>
	98.35	97.71

I have never met with any specimen from Cornwall, nor am I aware that there exists one in any English cabinet, or I should have been anxious to have exhibited it in my British Mineralogy before it was concluded.





## TAB. LXXXII.

SILEX *Aploma*.*Aplome*.

---

SYN. *Aplome*. *Haiiy Traité, IV. 336. Tabl. 58.*  
*Bournon's Catal. 42. Aikin, 226.*

---

**T**HIS was first described as a species by Haiiy : it bears a considerable resemblance to common Garnet, but is distinguished from it by striæ along the short diagonals of the faces of the rhomboidal dodecahedrons, in which it crystallizes : it has also an indistinct foliated structure parallel to the faces of a cube, with less lustre, and an inferior specific gravity. There are two principal varieties ; one in small crystals of a more or less dull green or yellowish green colour, from the Bannat ; the other in larger crystals of a brown colour, from Schwarzenberg in Saxony : this latter is the variety I have selected from the British Museum, as it exposes its characters best in a figure. I have also added a sketch from the British specimen mentioned by Bournon in his catalogue. I am informed by Mrs. Mawe, from whom the Count obtained it, that it was found in digging a well in some part of North Wales.\* The crystals want the characteristic striæ ; but this defect is supplied by truncations upon some of the solid angles, indicating the same pri-

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\* When I completed British Mineralogy I had not ascertained this fact.

mitive : the black substance in which they are imbedded is Oxide of Manganese.

Laugier gives us the following analysis :

Silex . . . . .	40
Alumine . . . . .	20
Lime . . . . .	14.5
Oxyde of Iron . . . . .	14.5
Oxyde of Manganese . . . . .	2
Ferruginous Silex . . . . .	2
Loss by calcination . . . . .	2
Loss . . . . .	5
	<hr/>
	100.0
	<hr/>







## TAB. LXXXIII.

SILEX cinnamomeus.

*Cinnamon Stone.*


---

SYN. Kanelstein. *Klaproth. Werner. Haiiy, Tabl. 62.*

Hyacint. *Mohs, Journal des Mines, No. 130. p. 139.*

Cinnamon stone. *Aikin, 227.*

Cinnamon stone and Hyacinth of Lapidaries.

---

THE Hyacinth of the Lapidaries is sometimes Cinnamon stone, and sometimes orange-brown Zircon, and Mineralogists have often confounded them together; but Klaproth's analysis has shewn them to be perfectly distinct, and that Cinnamon stone is nearer related to common Garnet. The crystal of Cinnamon stone which I have been fortunate enough to obtain, appears, although not very perfect, to be the same dodecahedron with the edges rounded, and the surface not striated but smooth and shining, with a slight greasy lustre. The specific gravity of Cinnamon stone is about 3.6 that is, rather lower than that of Garnet, but very considerably lower than the specific gravity of the true Hyacinth or Zircon. Garnet is so variable in its composition and character, that it would be premature to pronounce that Cinnamon stone is only a variety of it, before more perfect crystals are examined. Haiiy seems inclined to consider with Mohs, that it is only a variety, but he has observed an indistinct foliated structure parallel to the

faces of a rhomboidal prism, measuring a few degrees above 100. My specimens are from Ceylon. The lower one consists of rounded and fractured crystals, among which are several faces indicating rhomboidal dodecahedrons: they are surrounded in part by Schaalstein.

Analysis by Klaproth.

Silex . . . . .	38.8
Alumine . . . . .	21.2
Lime . . . . .	31.25
Oxyde of Iron . . . . .	6.5
Loss . . . . .	2.25



84.



## TAB. LXXXIV.

## ZINCUM oxygenizatum.

*Oxide of Zinc.*


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SYN. Zinc oxydé. *Bournon's Catal.* 367. *Dr. Bruce's American Min. Journal*, 96.

---

**F**IRST discovered in the Iron mines of Sussex, New Jersey, by Dr. Bruce: it accompanies grains and crystals of Magnetic Oxyde of Iron, imbedded in a greyish foliated Limestone, and is found in considerable abundance.

It may be distinguished by the following characters: its specific gravity is 6.220; it is readily scratched with a knife, affording a dull yellowish orange powder; it gives a colourless solution with muriatic acid, and is infusible alone before the Blowpipe; its colour is attributable to the Iron and Manganese it contains:

Analyzed by Dr. Bruce it gave—

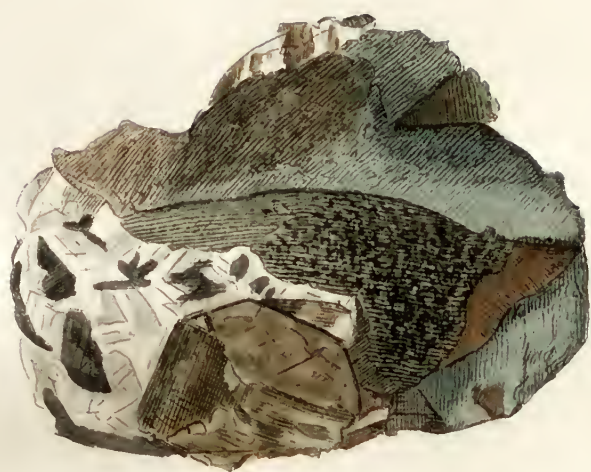
Zinc . . . . .	76
Oxygen . . . . .	16
Oxides of Manganese and Iron	8
	<hr/>
	100
	<hr/>

The specimen figured is in the British Museum.









## TAB. LXXXV.

## FERRUM muriatum.

*Muriate of Iron.*


---

SYN.	Fer muriaté.	<i>Hall in Lucas, II. 418.</i>
	Pyrodmalite.	<i>V. Moll's Eph. IV. s. 390.</i>
	Pyrosmalith.	<i>Karsten Tabel. s. 103.</i>
	Pyrosmalite.	<i>Jameson, Ed. 2. III. 311.</i>

---

THESE have been two specimens of this curious mineral brought to England by Dr. Gmelin of Wurtemberg; the largest was presented by him to the British Museum, whence I have obtained the figure. It is a Muriate of Iron, combined with a small portion of Silix, which defends it from the action of water, although it is soluble in muriatic acid: before the blowpipe chlorine is liberated in pungent fumes, whence it has been called Pyrosmalite, leaving a magnetic globule. It was discovered in Bjelke's mine, in Nordmark, Wermeland, in a bed of Magnetic Oxide of Iron, accompanied by Carbonate of Lime and Hornblende. The specimen in the Museum is about half of an hexahedral prism, lying upon its side among foliated Carbonate of Lime upon a greenish earthy stone, in the fissures of which are minute crystals of Hornblende. The end of the prism is fractured; it has a pearly lustre resembling pinité, and exhibits laminæ perpendicular to the sides: the cross fracture is splintery; in some parts it is semi-transparent, and rather browner than in the opaque parts.







TAB. LXXXVI.  
 CARBO dusosmus.\*  
*Dysodile.*

- SYN. Dusodile. *Cordier, Journal des Mines* xxiii.  
 271. (*Prem. sem.* 1808.)  
 Houille papyracé, *Dysodile. Haiiy Tabl.* 71.  
 Terre foliée Bitumineuse de Mèlilli, vulg.

**DYSODILE** was brought before the mineralogical world by Cordier who published an account in 1808, from specimens found at Mèlilli, near Syraeuse, in Sicily, by Dolomieu, some ten years before. From this account it appears that it had been known by the inhabitants of the country where it occurs, a long while, and that they had worked the mine, but without profit, for there is only a thin stratum of it, and that between strata of secondary Limestone.

At first sight it might be taken for a mass of paper that had lain a number of years under ground, and become of a dark colour, its structure is so perfectly foliated; the folia are brittle, easily separated from each other, and possess some elasticity even when dry; when heated in water they separate spontaneously, become more easily pliable, and are softened, but still elastic: they give no colour or taste to the water, but it acquires an earthy smell, and earthy particles separate from between the lamina, leaving them slightly translucent. It is highly inflammable, burning with a bright flame until a white ash is left of the same form, except a few blisters and equal to above a third of its weight: if the flame be extinguished a fœtid smoke is evolved of a dif-

\* From *δδς* male and *σμοσ* olens.

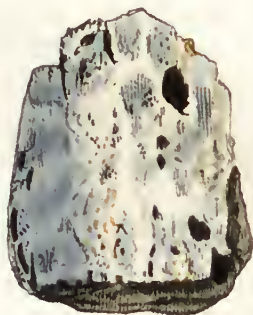
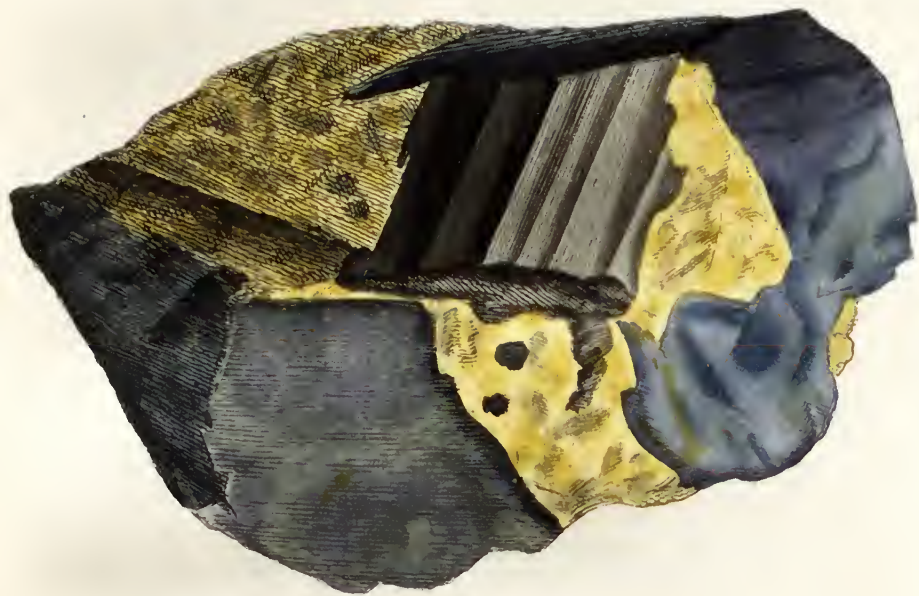
ferent scent from either that of Bitumen, Wood-Coal, or Bituminous Coal: I think it may be compared to a mixture of true Bitumen and Peat, free from the resinous smell sometimes found in Wood-Coal, but with a portion of animal matter: the scent was so intolerable to Cordier, who named it from it, that he says it is necessary to burn but a very small fragment to poison a room for an hour. The specific gravity, according to him, is 1.146. I understand a variety has been found in France, but I have not seen specimens.

The sports of nature are always admired, either from the great dissimilarity they bear to her usual productions, or from the resemblance things of perfectly different kinds exhibit in some characters to each other; thus the varieties of Asbestos, Dentrines, &c. are esteemed by every one: when nature produces any thing resembling the works of art, an additional gratification is felt, as if man were flattered by the imitation; thus, dysodile from its resemblance to paper or parchment, Soap-rock, leather-like Asbestos, graphic Granite, &c. are highly appreciated, even by persons wholly unacquainted with mineralogy. The present substance has its characters, as a mineral, so much disguised by the folded as well laminated structure, that it is difficult for those not conversant with the subject to believe it is one; a similar structure may, however, be traced through Gneiss, Slate, and other stratified rocks.

The liberality of G. B. Greenough, Esq. in presenting me with a handsome specimen for figuring, is one of the many proofs he has given of his zeal in promoting the distribution of knowledge. One specimen in this Gentleman's collection has the impression of a small fish upon it: probably some remains of the animal substance might be traced by an attentive analysis, to be the cause of the difference between Dysodile and elastic Bitumen.







TAB. LXXXVII.  
SILEX dichroma.

*Dichroite.*

---

- SYN. Iolith. *Werner and Karsten.*  
Iolithe. *Haily Tabl. 61.*  
Dichroïte. *Cordier, Journal des Mines,*  
*xxv. 129. Bournon Catal. 51.*  
Iolite. *Aikin, 194.*  
Steinheilite. *Berzelius, &c.*
- 

THE leading variety of this mineral was found near 30 years ago, in the neighbourhood of the Cape de Gate, in Spain, in grains dispersed through gneiss, in a decomposing slate that contained many garnets: after a while the French Mineralogists suspected, that what has often been called blue Quartz by authors, and Water Sapphire by jewellers, was a variety of Iolite; Cordier, discovering that different colours were transmitted through it in different directions, rendered this opinion more plausible, and named the substance Dichroite:---hitherto it had occurred in grains or ill defined prisms of either 6 or 12 sides, but it has since been discovered in large prismatic masses, among Copper Pyrites, at Orrayervi, in Finland, and named Steinheilite, after Count Steinheil, Governor-General of that district, who has contributed much towards the progress of Mineralogy in the north: the analyses given below, prove all three to be varieties of one species, if the substance be a distinct species itself.

Cordier has described a cleavage parallel to a 12-sided prism, but this is very indistinct, and may arise only from an aggregation of plates around a prism of that form, without indicating the integrant molecule: upon a careful examination of the Sapphire d'eau, and the Steinheilite, a fibrous structure may be discerned, or at least they appear to be penetrated by fibres, and it is in the longitudinal direction of these fibres that the blue colour is conspicuous; but while looking through their side, in which direction they of course are most visible, the mineral appears of a light dull yellowish brown; the direction of the fibres also corresponds with the axis of the prism. Is it not possible that this substance may be Quartz, penetrated by transparent blue Tourmaline, in fine

capillary crystals? it is well known that Tourmaline possesses the same character of transmitting different coloured light, or different quantities of light in different directions. A capillary variety of the exact colour is found in Cornwall, and exhibited on tab. 483, in my

W.P.H.

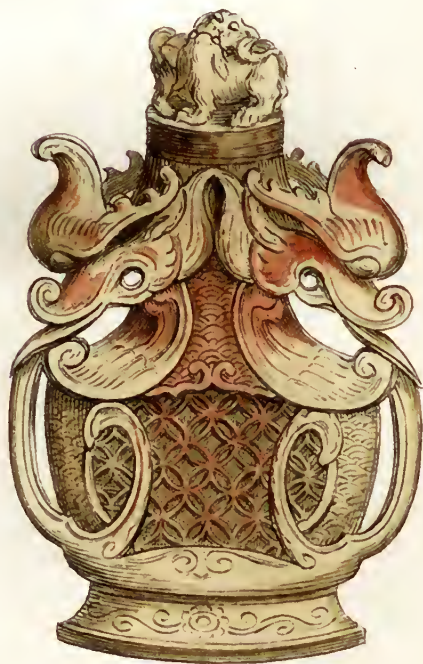
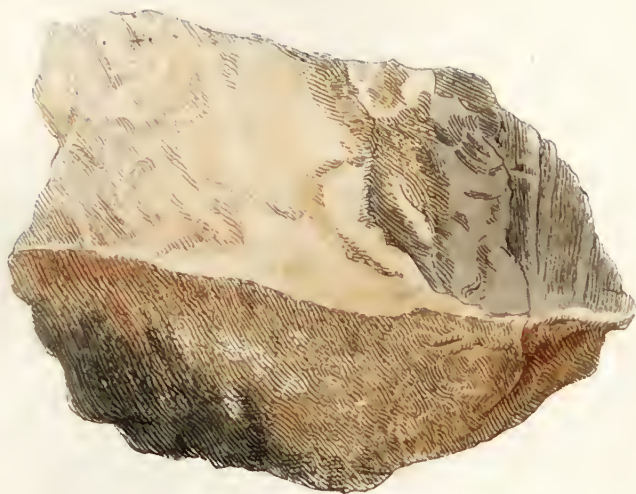
British Mineralogy. The variety from the Cape de Gate is rare. I have been enabled to give but a small figure of it, from a specimen in the collection formerly possessed by the Count de Bourbon, and with the use of which I was so freely indulged by him. I have given two views of the variety called Water Sapphire, from a specimen lent me by my kind friend Mrs. C. Codrington; it had been polished and perforated before it was broken: it shews the fibres in the interior very distinctly. The exact locality of this variety does not seem to be known: it is by some said to come from India, and by others from Macedonia. The largest figure is from a Swedish specimen in the British Museum; it shews the sections of two prisms, and the side of a third: they all appear to be rectangular, with their longitudinal edges replaced by three planes of various extent: should this prove, from the examination of more perfect crystals, to be the real form, it will militate strongly against the idea of their being Quartz, either with or without Tourmaline. That it is not pure Quartz has been proved by Gadolin, who found it to contain a large quantity of Alumina. The prisms are coated with a black substance firmly united to them.

Dr. Leopold Gmelin has favoured us with the following analyses:

The Iolite, from the Cape de Gate, contains	The Sapphire d'Eau.
Silicia . . . . . 42.6	. . . . . 43.6
Alumina . . . . . 34.4	. . . . . 37.6
Magnesia . . . . . 5.8	. . . . . 9.7
Lime . . . . . 1.7	. . . . . 3.1
Potash? . . . . .	. . . . . 1.0
Oxide of Iron . . . . . 15.0	. . . . . 4.5
Oxide of Manganese . . . . . 1.7	a trace.
101.2	99.5

Dichroite has a specific gravity of about 2.56, and is difficultly fusible by the blow-pipe into a greyish green enamel.





## TAB. LXXXVIII.

SILEX glaphicus.

*Bildstein.*

- 
- SYN. Pierre de Lard. *Romé de Lisle, II. 520.*  
 Bildstein. *Brochant, Werner, &c.*  
 Agalmatolithe. *Klaproth, &c.*  
 Talc glaphique.\* *Haüy Traité, III. 256.*  
*Tabl. 68.*  
 Agalmatolite. *Aikin, 202.*
- 

VARIOUS are the conjectures respecting this substance; but so little is known of it, or even the substances to which it is nearest related, except what is in itself contradictory, that no decision can be made respecting it. The non-existence of Magnesia in it distinguishes it from Steatite; nevertheless they have both been considered as compact varieties of Talc, first by Haüy, and more lately by Bournon: its analysis approaches more nearly to that of Mica, or Lepidolite, as it seems to bear the same relation in external characters to Mica that Steatite does to Talc, but agrees better in the constituent parts. It has hitherto been brought from China, carved into various utensils, or grotesque figures, which are commonly said to be formed of boiled rice. It has also been found at Nagyag in Transylvania. Aikin mentions its occurrence at Glyder Bach in Caernarvonshire, but upon what authority I know not. It may be distinguished from Steatite by its not being acted upon

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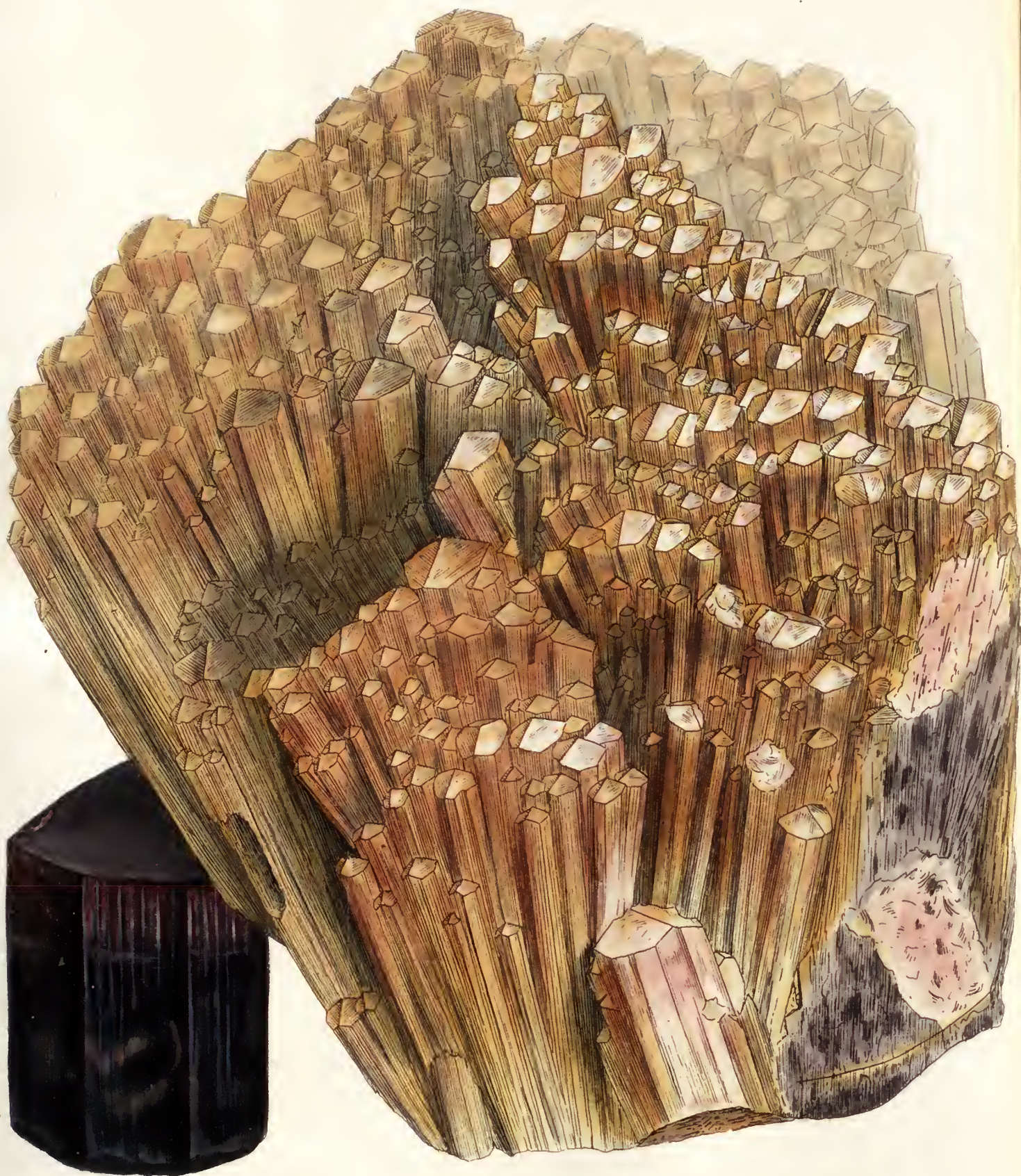
\* Derived from γλαφω and signifies fit for carving or sculpture; distinct from *glaphique*, which has been quoted for Haüy's word.

or disintegrating when wetted. The following are the analyses most to be relied upon :

	By Vanguelin,	Of the Chinese, by Klaproth,	Of that from Nagyag by do.
Silica . . .	56 . . .	54.50 . . .	55.0
Alumina . . .	29 . . .	34. . . .	33.0
Lime . . .	2		
Potash . . .	7 . . .	6.25 . . .	7.0
Iron . . .	1 . . .	0.75 . . .	0.5
Water . . .	5 . . .	4. . . .	3.0
	<hr/>	<hr/>	<hr/>
	100	99.50	98.5

I have represented a fragment of the stone, and beneath it an essence bottle carved out of it, as it may be cut nearly as easily as chalk, with an appearance something like Ivory.





## TAB. LXXXIX.

ARGILLA electrica, var. purpurea.

*Tourmaline, var. Rubellite.*


---

SYN. Rubellite, red schorl of Siberia. *Kirwan*,  
I. 288.

Tourmaline Apyre? *Haiiy*, IV. 401.

Tourmaline rouge de Sibérie. *Bournon*, 69.

Siberite, red schorl, &c.

---

ALTHOUGH Rubellite is only a variety of Tourmaline, it is such an interesting ore, that I have thought a figure of the most famous specimen yet known in the world, would be acceptable: it is that presented to Col. Symes by the King of Ava, in whose territories it was found. From Col. Symes it passed into the Grevillian collection, with which it was purchased, having been valued at £500,\* for the British Museum, where it now stands, the pride of the mineral collection. It consists of a scopiform group of 9-sided prisms, terminated by trihedral pyramids, the prism in the centre of the group is the longest; on three sides of this the surrounding crystals are gradually shorter, forming a rugged trihedral pyramid, so obtuse as to resemble the corner of a cube: the edges of this pyramid are strongly defined by three rows diverging from the apex of more closely connected crystals than those upon the sides. The interior of the mass is of a deep reddish purple colour, and so intense as to be almost opaque; but the surface is of a yellowish brown colour; and between the two the crystals are transparent, and of a pink colour. I have added a crystal of a less rare variety of Rubellite from Siberia.

---

\* I was told that it was once valued by an eminent Oryctogonist at 1000 guineas.







## TAB. XC.

## SILEX Fahlunensis.

*Fahlunite.*


---

SYN. Fahlunite. *Bournon* 99.

Hard Fahlunite. *Hisinger*, see *Thompson's Annals of Philosophy*, ix. 79.

---

THE name Fahlunite has been applied to the variety of Spinnelle called Automalite, by Karsten, and subsequent authors; but English collectors have long distinguished by that name a mineral from the same place that resembles precious Serpentine, but is foliated: it is generally of a brown colour, yet varieties occur of different shades of green and greenish black. The brown translucent varieties are often crystallized in large hexahedral prisms, in which the foliated structure is perpendicular to the axis; the crystals are imbedded in a dull grey talcose rock or Potstone, accompanied by Galæna, Copper, and Iron Pyrites. The green varieties are disseminated through a similar rock, but possess less transparency, are more waxy, and shew the foliated fracture less distinctly. The hardness of both varieties is greater than that of Carbonate of Lime, but less than that of Fluor. The surfaces of the laminæ are smooth and shining; the cross fracture presents an uneven dull waxy surface, and is rather splintery; as the colour becomes more intense, the waxy appearance is stronger, the opacity increased, and the hardness diminished. It was first brought to England from Fahlun in Sweden, by Dr. E. D. Clarke.

The analysis of a yellowish brown variety, by Hisinger, gives---

Silica . . . . .	45.90
Alumine . . . . .	31.10
Magnesia . . . . .	13.50
Oxide of Iron . . . . .	3.00
Oxide of Manganese . . . . .	0.50
Lime, Zinc . . . . .	0.20
Volatile matter . . . . .	3.00
	<hr/>
	97.20
	<hr/>





91.



## TAB. XCI.

## MANGANESIUM sulphureum.

*Sulphuret of Manganese.*

SYN. Manganglanz. *Karsten.*

Manganèse sulfuré. *Haüy, Tabl. 111.*

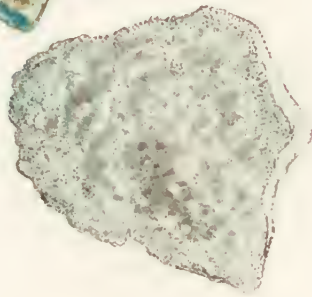
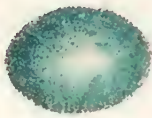
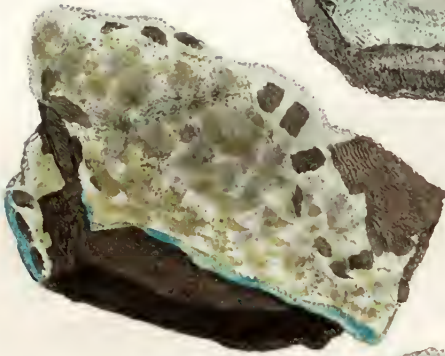
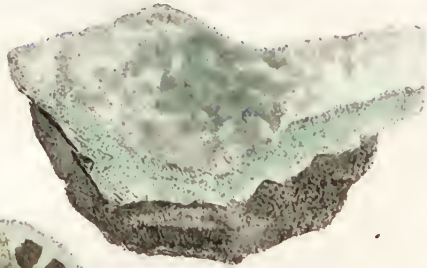
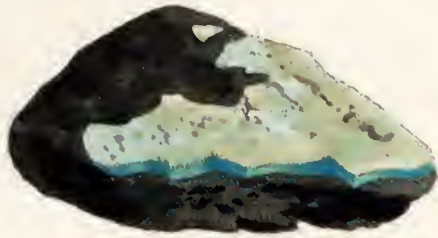
Sulphuret of Manganese. *Aikin, 132.*

THIS ore of Manganese is found in largish grains among Blende and Copper Pyrites in the rose-coloured Carbonate of Manganese of Nagyag, that serves as a matrix for the ores of Tellurium and Gold. It may be distinguished from other grey metallic minerals by its powder, which is greener than the mass, and by its behaviour under the blow-pipe, giving out Sulphur, then becoming rusty black without melting; it tinges nitrous borax purple; its specific gravity is 3.950: it is said by Haüy to be divisible into a rhomboidal prism, which may be subdivided in the direction of the diagonals of its transverse section. Klaproth and Vauquelin have both analyzed this ore, and both mention Oxide of Manganese as a constituent part of it; but it appears inconsistent with the present ideas of the combination of Sulphur with metals, that there should be oxygen present in a sulphuret, and the metallic lustre of the fresh fracture speaks also against the probability of its being an oxyde.

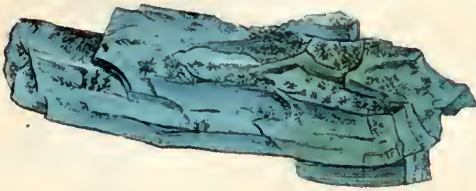
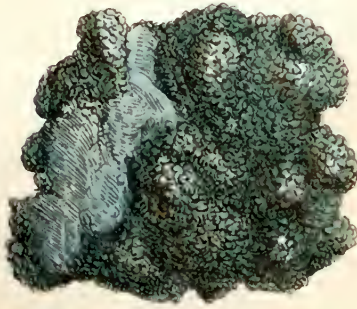
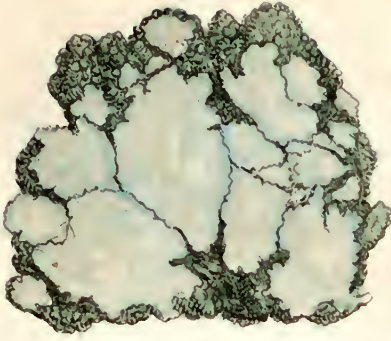
Analysis	by Klaproth, by Vauquelin.	
Oxide of Manganese	82.0	. . 85
Sulphur . . . .	11.5	. . 15
Carbonic acid . . . .	5.0	
	98.5	90.0











*From a publication by J. S. Sowerby, London.*

TAB. XCII. & XCIII.  
 ARGILLA Birusia.  
*Birjusa (Turquoise).*

- SYN. Turquoise of Persia, or Oriental Turquoise  
 of Mineralogists, English Jewellers, &c.  
 Vieille Roche of European Jewellers.  
 Birjusa of the Russians and the Turkish  
 Merchants.  
 Turquoise, the cut specimen. *Bournon's*  
*Cat.* 320.  
 Turkis. *Reuss. Vol. III. part ii. p.* 511.  
 Turquois, &c. *König Synops. of Brit.*  
*Mus. ed.* 1817, *p.* 16.

ORIENTAL Turquoise was formerly esteemed, and very deservedly, the most beautiful of opaque gems, but the substitution of fossil bones or teeth, without their having been generally distinguished, and numerous imitations, have lessened its value in Europe: still, however, it is a principal article of commerce\* among the Persians, Russians and Turks. Mineralogists have for a long time considered both the occidental and oriental Turquoise, or the Nouvelle and Vieille Roche, as fossil teeth and bones, penetrated by Calx or Carbonate of Copper; and, notwithstanding Reaumur and others have pointed out differences between them, most modern Mineralogists have either wholly excluded Turquoise from their systems, or spoken very slightly about it. It appears that Lowitz was acquainted with the true oriental Turquoise, and found in it a good deal of Argill, with a little Copper and Iron; and that Bruckman considering this, and the situation of the substance from Korosan (or Chorossan) was induced to think it a distinct mineral: however, the prevalence of coloured fossil bone among collectors, has misled others; and Bouillon Lagrange having analysed this, determined later Mineralogists in favour of the opinion, that all the Turquoise was either fossil bone or the enamel of the teeth of some large animal, coloured by Phosphate of Iron, and not Copper as had been previously supposed. Mr. König informs me that John has

\* A good blue stone, free from specks, half an inch in diameter, may now fetch three or four hundred pounds.



given the analysis of Turquoise, from Korosan, which confirms Bruckman's opinion; he has himself placed it in the Museum collection, and Synopsis among the hydrates of Alumine.

Jewellers and Turkish merchants distinguish between the fossil bone and the true Turquoise; the latter being known by the epithet *Vieille Roche* or called *Birjusa*: it occurs in veins and tuberose masses, in a greyish black stone, resembling the silicious schistus, in which the *Hydrargillite* of *Barnstaple* is found\*. There are probably several mines that are worked for it, all situated in Korosan, in the north east part of Persia, *Bouillon Lagrange*† mentions two: one is three days journey from *Meched*, called the *Old Rock*, which is only dug on account of the King of Persia; the other, five days journey from the same place, produces Turquoises of a pale colour, that are sold at a very low price. The specimen I have represented on tab. 93. is from a mine at *Nischassur*, in Korosan, although of a poor colour, it was purchased at a high price by Mr. *Heuland*, to whom I am indebted for the Russian name, and who assures me that the genuine oriental Turquoise or *Birjusa*, is found in no other country; but that stained fossil bone is frequently understood by the name Turquoise among the Jewellers of the continent, in opposition to that of *Vieille Roche*. The figures upon tab. 92. are from several specimens presented to me by Mrs. *Liston*, whose kindness in collecting illustrative minerals from the east, I must be allowed to express my gratitude for. They are from a new mine, in which, when the works are more advanced, it is expected that fine stones will be found, many of those already obtained being of a good colour and texture, but defective in thickness. Sir *Charles Giesecké* upon examining some of these and others communicated by Mr. *Heuland*, has found them to consist principally of Alumina, with a little water, coloured by Copper, thus further confirming *Lowitz's* analysis, and *Bruckman's* opinion. I have given for illustration, a figure of the bone Turquoise, from a fine specimen belonging to Mr. *Walker*, of *Arno's Grove*; its laminated structure will distinguish it from the mineral Turquoise; I suspect it would not retain its colour so well as the genuine.

Analysis of Oriental Turquoise by <i>Johnst.</i>	Analysis of Bone Turquoise by <i>Lagrange.</i>
Alumine . . . . . 73.0	Phosphate of Lime . . . . . 80
Water . . . . . 18.0	Carbonate of Lime . . . . . 8
Oxide of Copper . . . . . 4.5	Phosphate of Iron . . . . . 2
Oxide of Iron . . . . . 4.0	Phosphate of Magnesia . . . . . 2
	Phosphate of Manganese, a trace —
	Alumine . . . . . 1.5
	Water and Loss . . . . . 6.5
	—————
	100.0

\* One of the specimens has a small vein of ferruginous Calcareous Spar, running through it.

† See his paper, translated in *Phil. Mag.* 26, 220, from *Annales de Chimie*, 59, 180.

‡ In the *Journal de la Société d'histoire naturelle de Moscou*, Vol. II and in *Gehlen's Journal*, Vol. III.





TAB. XCIV.  
SPINELLANE.

---

SYN. Spinellane. *Nose Etudes Mineralogiques*,  
p. 109. *Haüy Tabl.* 66.

---

WE know but little more respecting this inconspicuous mineral than what is related of it by Nose and Haüy : it is sufficiently distinguished from Spinelle, with which Nose compared it, by its inferior hardness, as it may be scratched by a knife, and easy fusibility into a white frothy enamel. Haüy describes the nucleus to be an obtuse rhomboid, whose faces measure upon each other  $117^{\circ}23'$  and  $62^{\circ}37'$ , which is divisible into six tetrahedrons, by planes parallel to the lateral edges ; its crystals being six-sided prisms, terminated by three-sided pyramids, with truncated edges, have much the appearance of dodecahedrons, with rhomboidal planes and truncations parallel to the faces of cubes ; but Haüy has observed a difference of about two degrees in the measure : the faces upon the edges of the pyramid are the primitive ones, the faces of the pyramid being analogous to those of the cube. The structure Haüy has observed, is nearer that of Garnet than of Spinelle ; and it is to be remembered that Haüy gives his measures with some degree of doubt. Spinellane has hitherto been found only upon the borders of the lake of Laach, in the department of the Rhine and Moselle, in imperfect crystals dispersed among white semitransparent almost tabular crystals of Feldspar, loosely aggregated together, and accompanied by Magnetic Oxide of Iron : Haüy mentions also Quartz, Hornblende and black Mica.







## TAB. XCV.

## SILEX orthitus.

*Orthite.*


---

SYN. Orthite. *Berzelius in Afhand. i fysik, &c.*  
*see Thomson's Annals, ix. 160.*

---

THE only account at present published in England of the Orthite is that above quoted, where the following analysis is given :

Silica . . . . .	32.00
Lime . . . . .	7.84
Alumina . . . . .	14.80
Protoxide of Cerium .	19.50
Protoxide of Iron . .	12.44
Protoxide of Manganese .	3.44
Yttria . . . . .	3.44
Water . . . . .	5.36
	<hr/>
	98.82

Before the blow-pipe it loses its blackness, and is fused with a slight ebullition ; it is hard enough to scratch glass, but yields to the knife, producing a light brown powder.

Berzelius and Gahn discovered it in 1816, when examining the neighbourhood of Fahlun, in Sweden, in a vein of Granite that traverses Gneiss, and in which the mine of Finbo is situated.

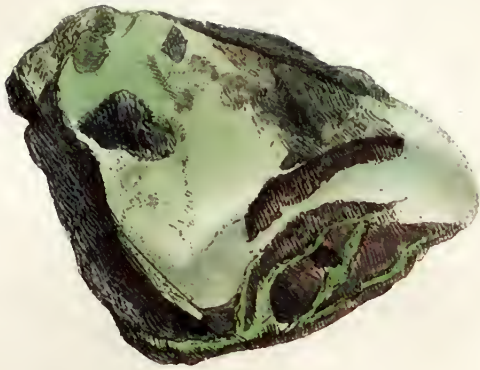


“ At Kararfvet, situated on the opposite side of Falun, there is another vein of Granite, which contains crystallized Gadolinites, some Ytthro-tantalites, and a variety of Orthite, which has the curious property of taking fire before the flame of the blow-pipe, and of continuing to burn for some moments. It has received the name of Pyrorthite: besides the same constituents as the other Orthite, it contains 25 per cent. of carbon.”—(*Thompson's Annals.*)

I am indebted to the freedom with which novelties are communicated from the British Museum, for early figures of this new mineral: the specimens were sent by Prof. Berzelius himself.

The lower figure represents the Pyrorthite from Kararfvet.





## TAB. XCVI.

## NICKOLUM arseniatum.

*Arseniate of Nickel.*


---

SYN. Nickelocker. *Werner.*

Nickel ochre. *Kirwan II. 283. Aikin 131.*

Nickel oxydé. *Hallé Traité III. 516.*

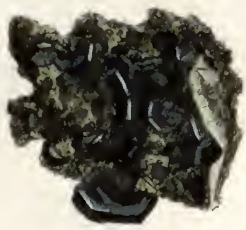
*Tabl. 84.*

---

OXIDE of Nickel, as this mineral has generally been termed, has been known a long time encrusting in a pulverulent form, or compact in veins, among Arsenical Nickel, and seems to be formed by the oxygenization of that ore, in which case it is hardly probable that it can be either a pure hydro-oxide, or a mixture of the oxides of Nickel and Arsenic, but must be a real Arseniate, as some have supposed; its insolubility in cold nitric acid tends to confirm this idea. The specimen figured is from Siberia: Scotland is said to produce it, but I have not met with specimens.







## TAB. XCVII.

ARGENTUM sulphureum, fragile.

*Brittle Sulphuret of Silver.*SYN. Sprödglaserz. *Werner.*Antimoniated Silver ore. *Kirwan 2, 118.*Argent Antimonié sulfuré noir. *Haiüy Tab. 76.*Argent sulfuré fragile. *Bournon's Cat. 207.*Brittle Sulphuretted Silver. *Aikin 78.*

Roschgewachs of the Hungarians.

THE oldest Mineralogists have recognized this species of Silver ore, but it has of late years become so rare, that it appears to have been unknown to Haiüy when he wrote his Treatise, and but imperfectly known when he published his Tables; this circumstance, as Bournon well observed, has caused him and other French Mineralogists to consider it as a variety of the dark red silver ore, which sometimes assumes a metallic lustre, and in a state of decomposition, may produce a black powdery mass, (the Argent noir of Haiüy's *Système* 111,416).

The analyses of the metallic sulphurets have in general been performed under circumstances that have rendered them questionable, especially the older ones, and even now it appears to be a matter of dispute, whether metals can unite to sulphur and oxygen at the same time; however, the metallic lustre of the present mineral exempts it from the suspicion of containing oxygen, at the same time that it distinguishes it from the red Antimonial Sulphuret of Silver, which probably contains an additional portion of Sulphur, combined. The tabular



form of the crystals of brittle Sulphuret and their being transversely striated upon their lateral planes, not longitudinally, joined to their perfect opacity and less degree of brittleness, will at once point it out to a Mineralogist. Bournon states the hexahedral prism to be the primitive form, and describes three modifications upon the terminal edges; the lower specimen in the plate contains one of these. In the red Silver the terminal faces of the crystals are generally in threes resulting from decrements upon the rhomb similar to those of Carbonate of Lime, in the brittle Silver ore they are in sixes, like those of the Phosphate of Lime; the former is also generally prismatic; the latter tabular: these observations tend to prove that they do not result from an alteration of the red Silver, as some have supposed. What the quadrilateral tables or rhomboids are, that have been mentioned as belonging to this substance I do not know, but I suspect they belong to the flexible sulphuret which often accompanies it. Sulphuret of Iron, red Silver ore, native Arsenic, Galena, &c. often occur with it in a matrix of Quartz and Carbonate of Lime. Klaproth's analysis is as follows:

Silver . . . . .	66.50
Sulphur . . . . .	12.00
Antimony . . . . .	10.00
Iron . . . . .	5.00
Copper and Arsenic .	0.50
Earthy substances .	1.00
	<hr/>
	95.00

Mr. Henry Heuland has assisted me with specimens for figures and examination; they are from the Neuen Morgenstern mine (new Morning Star mine) at Freyberg, in Saxony. The crystals in the larger one, of an uncommon size, are planted among arborescent flexible Sulphuret, with Iron pyrites; the other has only the pyrites.





## TAB. XCVIII.

## TANTALIUM oxygenatum.

*Tantalite.*

SYN. Tantalit. *Eckeberg.*

Tantale oxydé ferro-mangesifere. *Haiiy*  
*Tabl. 120.*

Tantalite. *Aikin 142.*

**T**ANTALITE is a variety of the same mineral as was named Columbite by Hatchet, which we have figured at tab. 6 : *Eckeberg* described it from a variety in grains and ill-defined crystals, imbedded in a reddish granite, found at *Brokärns Zinnsgate*, in the parish of *Kemito*, in *Finland* : a similar variety has been since found at *Broddbo*, in the same mine with the *Gadolinite*, which it very much resembles in external appearance, but may be distinguished from it by its infusibility. The most interesting variety is the one represented in the present plate, from specimens of *Mr. Heuland's*, as its crystals are pretty well defined, especially the large most magnificent one, an equal to which is not supposed to exist : one approaching it is in *Du Dree's* collection. It is a rectangular prism with two broad striated sides ; the narrow side is smooth and shining ; the solid angles and shorter horizontal edges are truncated : each of the vertical edges is also replaced by two almost linear facets. The rectangular prism is probably the primitive form. This variety is imbedded in a whitish friable Granite, the *Feldspar* in which is decomposing ; found in the *Bohmisch Waldgeberg*, not far from *Bodemmais* in *Bavaria*.

The following analyses have lately been published by Berzelius, (see Annals of Phil. 9, 74 and 76).

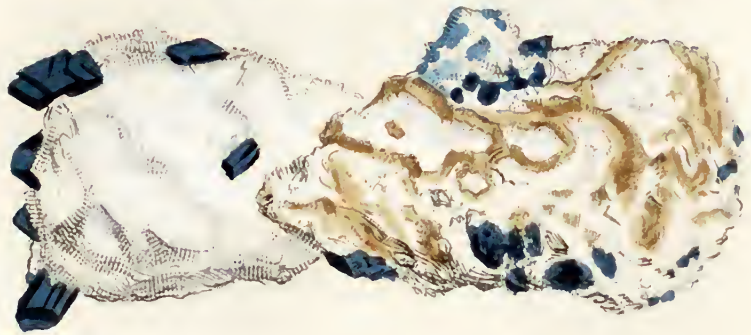
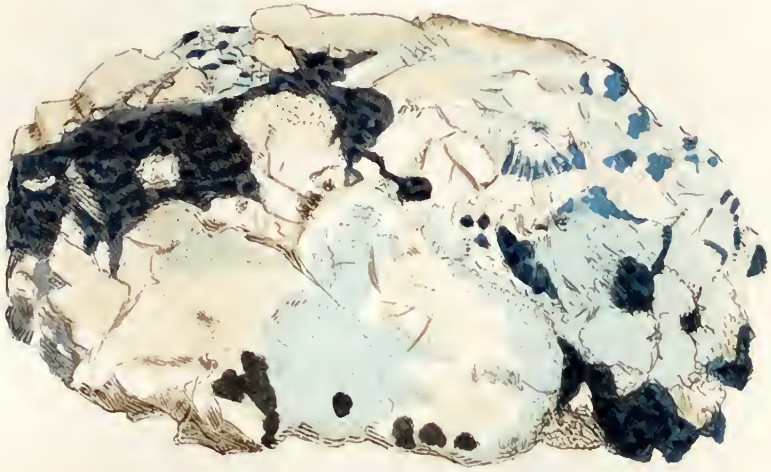
	Tantalite from Broddbo*	Ditto from Finland†.	
		Berzelius.	Wollaston‡.
Oxide of Tantalum . . . . .	68.22	83.2	85
Tungstic acid . . . . .	6.19		
Oxide of Tin . . . . .	8.26	0.6	
Oxide of Iron . . . . .	9.58	7.2	10
Oxide of Manganese . . . . .	7.15	7.4	4
Lime . . . . .	1.19	—	—
	<u>100.59</u>	98.4	99

\* Two other analyses are given; they show a slight variation in the proportions.

† Vauquelin and Klaproth have also analyzed the variety from Finland; their statements do not differ materially from Dr. Wollaston's.

‡ Phil. Trans. 1809.





## TAB. XCIX.

MAGNESIA carbonata.

*Carbonate of Magnesia.*

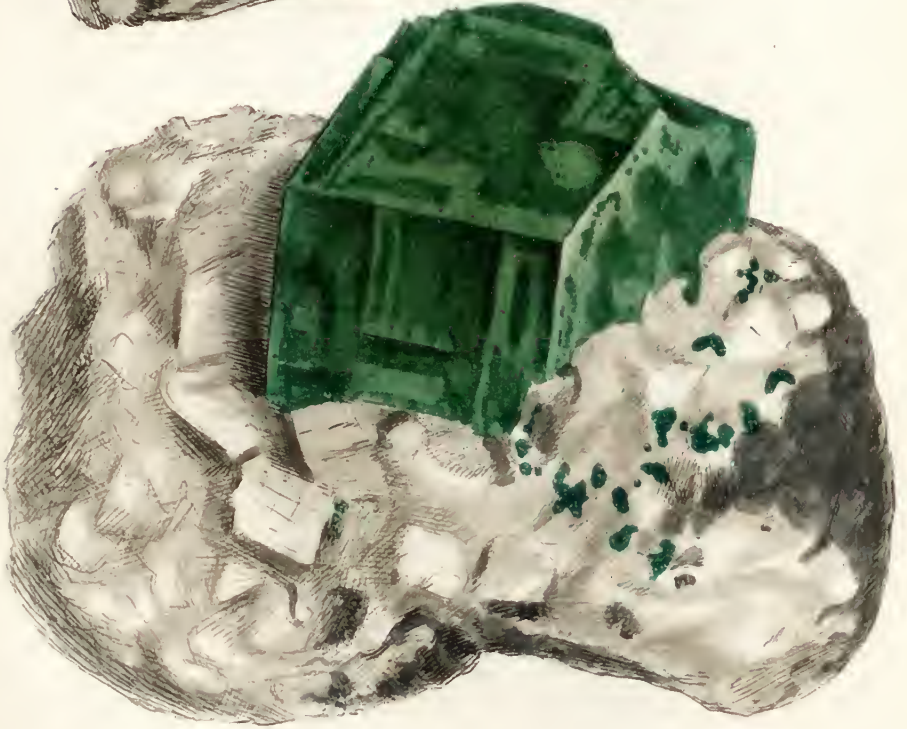
- 
- SYN. Magnésie native. *Broch.* 2, 499.  
 Reine Talkerde. *Germans.*  
 Magnesite de Mitchel. *Brongn.* 1, 490.  
 Magnésie carbonatée. *Haiiy Tabl.* 16.  
 Carbonate of Magnesia. *Aikin,* 163.
- 

**T**HERE has been found at various places, principally in veins in serpentine rocks, an opaque mineral of a more or less earthy texture, and consisting chiefly of Magnesia, sometimes combined with carbonic acid; this has been called Native Magnesia and Magnesite: the varieties holding most carbonic acid have been distinguished by the chemical name of Carbonate of Magnesia: the purest kind is that from Hrubshitz in Moravia: it is compact, and hard enough to scratch calcareous spar. Native Magnesia, free from carbonic acid, but united to 30 per cent of water, is found at Hoboken, in New Jersey. Haiiy says that in the present state of our knowledge we cannot easily decide whether the carbonate has been produced by the exposure of the native to the atmosphere; or whether they be originally distinct minerals. The substance exhibited in the present figure has been considered as Carbonate of Magnesia; it is, however, far from pure, but is rendered remarkable by being the matrix of beautiful insulated crystals, and groups, of blue Carbonate of Copper: it yields its Magnesia to sulphuric acid, in which it effervesces slightly: its texture is variable;



sometimes it is quite loose, at others it is so hard as to yield with difficulty to the finger nail: it commonly assumes an irregular mammillated surface, and is of a pure white, partially stained greenish by copper, or yellowish brown by iron. From Chessy, near Lyons.





## TAB. C.

SILEX Smaragdus (*var. pretiosus.*)*Emerald.*SYN. Smaragdus, *Auctorum.*Emerald. *Kirwan*, 1, 247. *Aikin*, 193.Schmaragd. *Werner*, &c.Emeraude. *Haiiy*, 2, 516. *Tabl. 32.**Bournon Catal. 39.*

OF all the precious stones the Emerald is acknowledged to be the most pleasing in colour; and although not equal in splendour or hardness to the others, is held in high estimation when clear and large. Good Emeralds are obtained at present from Santa Fé, in Peru, South America. The ancients must have been acquainted with some other part of the world in which they were to be procured, as there still remain several antique gems of this species.

The Emeralds described by the older classics were various kinds of green stone, such as Jasper, &c. It is probable that the true Emerald was imported into Europe from the interior of Africa.

The Aigue-marine, or Beryll, possesses all the properties of the Emerald except its colour, and they can only be considered as varieties, the latter being indebted to an admixture of oxide of Chrome for its beautiful hue. The crystals of Beryll have commonly striated sides, and this has been looked upon as a distinguishing character, but it is by no means constant. Other trifling distinctions

have been noticed, but they are such as are usually met with among acknowledged varieties of other minerals.

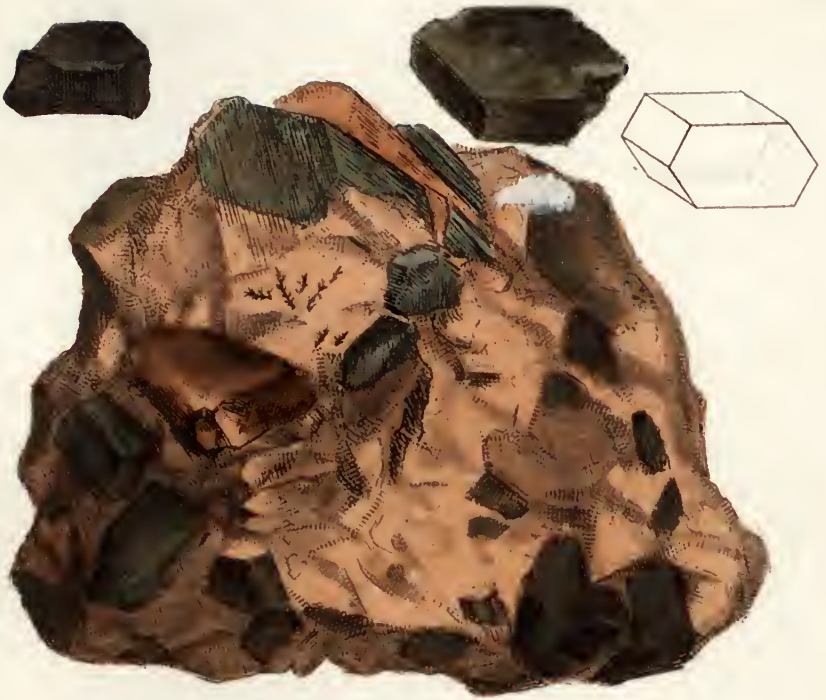
The fine specimens figured are the pride of the collection at the British Museum. The matrix is Carbonate of Lime, in rounded crystals among argillaceous Schistus.

The following is the analysis of Emerald given by Vanquelin :

Silica . . . . .	64.50
Alumina . . . . .	16.00
Glucina . . . . .	13.00
Oxide of Chrome . . . . .	3.25
Lime . . . . .	1.60
Water . . . . .	2.00
	100.35

The spec. grav. varies from 2.600 to 2.775: it is fusible, and rather harder than Quartz.





TAB. CI.  
 SILEX Gieseckeï.  
*Gieseckite.*

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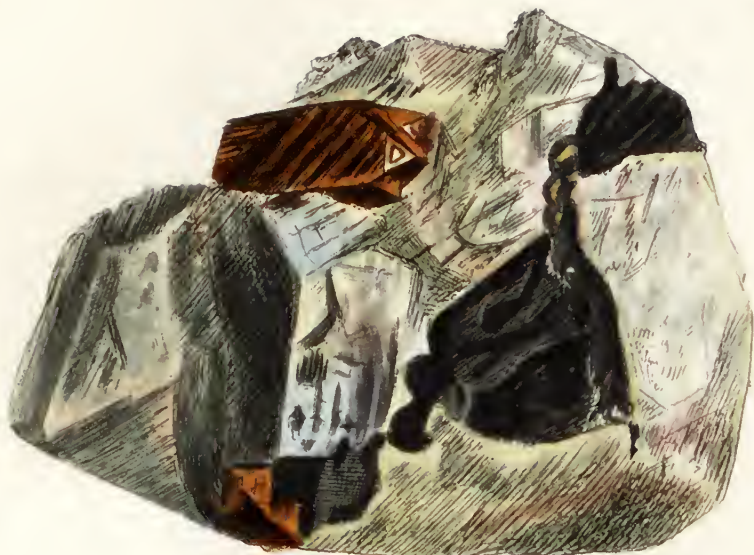
THE persevering researches of Sir Charles Giesecké, in Greenland, have been productive of several new and many rare Minerals, some of which a less intelligent Mineralogist would have passed over. The fortune of war had for some time deprived him of the honour due to his discoveries; but now his merit is every where fully admitted. By way of perpetuating his name in the list of persons who have made themselves conspicuous in science, it is desirable to name some mineral after him, and we would propose the substance before us, as it appears to be quite new, and was brought by him from Akulliarasiarsuk in North Greenland. It occurs crystallized in hexahedral prisms imbedded in a claystone Porphyry, accompanied by a few crystals of red Feldspar. The crystals are usually solitary, though two or three are sometimes attached together: two of their sides are constantly wider than the remaining four; the angles measure  $120^{\circ}$ . They break easily with an uneven shining surface and blunt edges, without shewing any tendency to a foliated structure: the lustre is dull, rather waxy, and they are possessed of some transparency: the colour is olive green, varying in intensity to almost black: the hardness is between Fluor and Calcareous Spar. When heated this substance hardens, loses its colour, and with some difficulty may be fused into an opaque enamel. The sp. grav. taken from a crystal of an intermediate colour, was found to be 2.787.



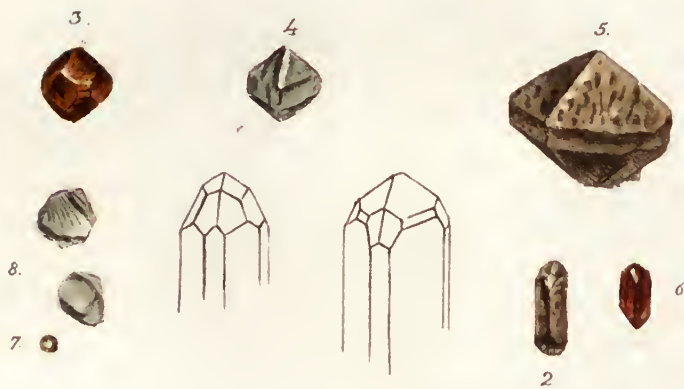
The mineral nearest related to Gieseckite is Pinite, but that is infusible, opaque, has a foliated fracture, and higher sp. grav.

It is to be hoped, that Sir Charles Giesecké, or some eminent chemist, will favour the scientific world with an analysis, and fuller mineralogical description than we have been able to compile from the few specimens which were in the possession of Mr. Heiland, that have come under our inspection. The one figured is placed in the cabinet of the Countess of Aylesford; it is illustrative of all the characters, except the size of the crystals, which is sometimes much greater,





1



## TAB. CII.

## ZIRCONIA Hyacinthus.

*Zircon, or Hyacinth.*

SYN. Zirkon and Hiacinth. *Kirwan*, 1, 257.

*Werner*.

Zircon. *Haiiy*, 2, 465. *Tabl. 28.* *Bour-*  
*non Catal. 24.* *Aikin.* 184.

Jargoon and Hyacinth of Jewellers.

THE Hyacinth has of late years been found in many places besides the Isle of Ceylon, from whence it is imported for Jewellers. Usually its crystals are very small, and found in the beds of rivers among sand that appears to be either the debris of trap-rocks, or volcanic, or mixed with iron-sand, as in Ceylon, (see figs. 3, 4, and 6,) where they are also accompanied with oriental Ruby, Spinell, Tourmaline, &c. Sometimes the crystals are minute, but very clear and brilliant;---such accompany the Platinum from South America.

Larger crystals of a redish brown colour, and imperfectly transparent, are found imbedded in Sienite at Friedrichschwärn in Norway, see figs. 1 and 2. Small crystals have been met with in Basalt, Trap, and Volcanic matter, in several parts, especially in Auvergne. In all these situations the crystals are perfect all round, and very rarely grouped together. The primitive form, according to Haiiy, in an octohedron (which is represented with the edges trunecated at fig. 5,) whose pyramids measure  $82^{\circ} 50'$  upon each other; this is frequently modified into a four or eight-sided prism, with a four-sided termi-

nation, or into a dodecahedron with unequal rhomboidal planes: the prism is sometimes terminated by acute eight-sided pyramids of which indications are shewn in fig. 2, and the outlines. Besides the crystallized form, Zircon is found in grains which are often colourless, or greyish, see fig. 8, with a peculiar smoky tinge that distinguishes them from Diamonds, in place of which Jewellers are tempted to use them by the play of colours they exhibit when cut. This variety is more particularly called *Jargoon* by the artizans. The coloured varieties loose their colour by being heated without the transparency being injured.

Fig. 1 is taken from a specimen in the British Museum; the matrix is a *Sienite*, composed of grey *Feldspar*, with an internal reflection of blue, and *Hornblende*; containing also *Pyrites* and *Molybdenum*.

Fig. 7, a red grain from *Expailly* in *France*.

The different varieties of *Zircon* afford nearly the same constituents as appears from the following analyses :

	From Ceylon, by Klaproth.		From Expailly, by Vanquelin.
<i>Zirconia</i>	69.0	70.0	66
<i>Silica</i>	26.5	25.0	31
<i>Oxide of Iron</i>	0.5	0.5	2
<i>Loss</i>	4.0	4.5	1.
	<hr/>	<hr/>	<hr/>
	100.0	100.0	100

*Zirconite* from *Norway*, by Klaproth :

<i>Zirconia</i>	. . . . .	65
<i>Silica</i>	. . . . .	33
<i>Oxide of Iron</i>	. . . . .	1
<i>Loss</i>	. . . . .	1
		<hr/>
		100.

The sp. grav. varies from 4261 to 4721.





TAB. CIII.  
ANTIMONIUM nativum.  
*Native Antimony.*

SYN. Native Antimony. *Kirwan*, 2, 245. *Aikin*, 56.  
Gediegen Spiesglas. *Emm. b.* 2, s. 464.  
Antimoine natif. *Haiiy*, 4, 252. *Tabl.* 112.

**N**ATIVE Antimony is possessed of all the characters of the pure metal obtained by art. It is of a laminated structure; the laminae crossing each other in ten different directions, four of them parallel to the faces of a regular octohedron, and six to the faces of a rhomboidal dodecahedron, form a very complicated arrangement. Its volatility, inflammability, and peculiar scent, are the striking features of its globule in the state of fusion. It is a rare mineral: it was first found by Swab, at Sahlberg in Sweden: it has been also found in the Hartz; the most magnificent specimens, however, have been brought from Allemont, in Dauphiny; they are large cellular masses, with compact white oxide of Antimony filling the hollows.\* The matrix is Quartz. A variety occurs at the same place, composed of minute foliated grains united into a largely laminated mass; it contains a variable portion of Arsenic; it is excessively brilliant.

For the figures given of these two varieties I am indebted to Mr. H. Heüland.

Klaproth's analysis of Antimony from the Hartz gave,

Antimony . . . . .	98.00
Silver . . . . .	1.00
Iron . . . . .	0.25
	99.25

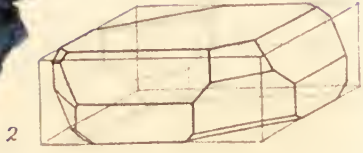
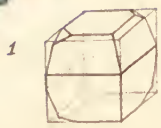
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\* When fresh broken they are so brilliant that it is impossible to give any idea of the lustre in a figure.









## TAB. CIV.

CUPRUM carbonatum, cœruleum.

*Blue Carbonate of Copper.*


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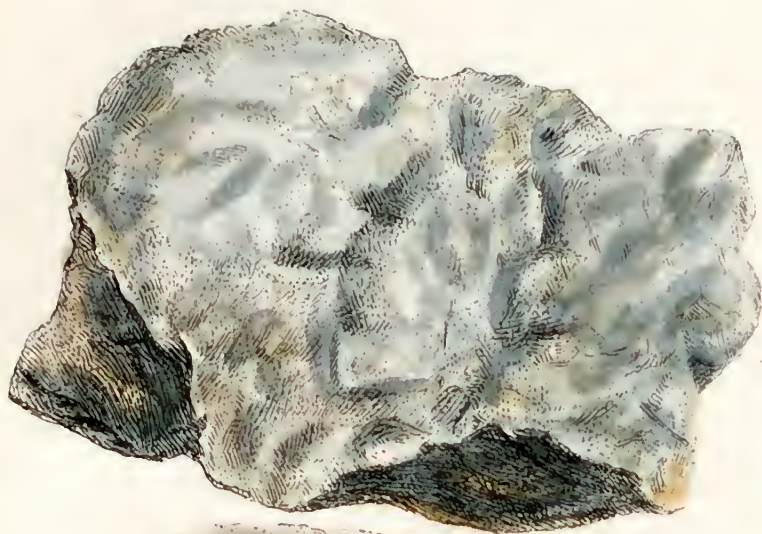
 SYN. Kupferlazur. *Werner.*
Mountain Blue. *Kirwan, 2, 129.*Cuivre carbonaté bleu. *Haiiy, 3, 562.**Tabl. 89.*Cuivre bleu. Cuivre azuré. *Bourn. Cat. 239.*Blue Copper. *Aikin, 89.*


---

THIS splendid variety of a well known and British mineral is so extraordinary both in form and size, that I thought a figure of it would be acceptable. The primitive form of blue Copper has been determined by Bournon to be an upright rhomboidal prism of  $56^{\circ}$  and  $124^{\circ}$ : this form is strongly marked in the larger specimen before us, and is modified by truncatures of the acute solid angles and bevellments of two of the edges of the base, and two of the terminal edges, as shewn in fig. 1. Fig. 2 has crystals of a more complicated form, where all the solid angles are truncated, the same horizontal edges as before mentioned bevelled at a more acute angle, the obtuse vertical edges truncated, and each of the acute vertical edges replaced by two faces alternately inclined towards the horizontal edges. These crystals are attached to a mass of the same substance, and in some parts are clothed with, or even apparently changed into velvety green carbonate of Copper. Both specimens are from Chessy, where they were imbedded in impure carbonate of Magnesia and Iron Ochre; see tab. 99.







## TAB. CV.

## ARGILLA ambigua.

*Blue Feldspar.*

- 
- SYN. Feldspar bleu céleste. *De Born. I. 378.*  
 Dichter felds-spath. *Emmerling, I. 271.*  
 Splittriger Lazulit. *Karsten, tabl. 46.*  
 Feld-spath bleu? *Haüy, II. 605. tabl. 60.*  
 Feldspath compacte bleu. *Bourn. Catal. 58.*  
 Blue Feldspar of Krieglach. *Aikin, 188.*  
 Blauspath. *Werner.*
- 

**T**HIS long known mineral has been so generally treated of as a variety of compact Feldspar, that modern writers seem to hesitate in considering it as a distinct species from it; but the result of its analysis should clear away all doubts on that head, even though the laminae be found to correspond with Feldspar in their direction, being perpendicular to each other. Its relation to Azurite is closer, both in general appearance and composition, but it is softer and heavier: the Azurite is also more distinctly laminated, and the laminae appear to be slightly inclined. Since Azurite itself, from the obscurity of its characters, is not a well established species, it is difficult to say how far Blue Feldspar may be connected with it; I therefore still consider it as an ambiguous mineral, and have named it accordingly, in the hopes that something may be hereafter discovered that will throw a light upon both species, and wipe away an unscientific appellation.



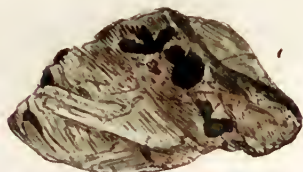
Blue Feldspar is disseminated among massy Quartz, accompanied with Tale in the fissures, in the same way as common Feldspar occurs in Granite; it has only been found in the valley of Murz, near Krieglach, in Stiria where it is abundant. I am indebted to Professor Cheirici for specimens brought by himself from that spot.

The specific gravity is from 3.046 to 3.060: before the blow-pipe it loses its colour, but does not melt alone: aided by Borax it affords a black glass.

Klaproth's analysis gives the following proportions:

Argilla . . . . .	71.00
Silicia . . . . .	14.00
Magnesia . . . . .	5.00
Lime . . . . , . . . .	3.00
Potash . . . . .	0.25
Oxide of Iron . . . . .	0.75
Water . . . . .	5.00
	<hr/>
	99.00





TAB. CVI.  
ARGILLA fibrosa.  
*Fibrolite.*

SYN. Fibrolite. *Bournon in Phil. Trans.* 1802, p. 289, 301. *Catal.* 54. *Haiiy Tabl.* 60.

THE Count de Bournon was the first person to describe this mineral, which he discovered among the substances that compose the matrix of Corundum, whether from the Carnatic or China. From the Count's description it appears, that it is rather harder than Quartz, of a fibrous structure, of a white or dirty grey colour, and when crystallized forms a rhomboidal prism of about  $80^\circ$  and  $100^\circ$ , but this form he has only met with once. It is infusible; the spec. grav. is 3214; upon collision it emits a deep reddish light. Bournon states, that it cannot by friction be made to give signs of electricity; but Haiiy observes, that when insulated it acquires by friction a very remarkable degree of resinous or negative electricity.

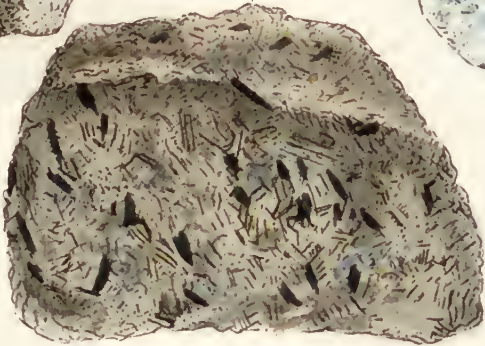
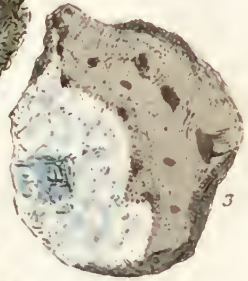
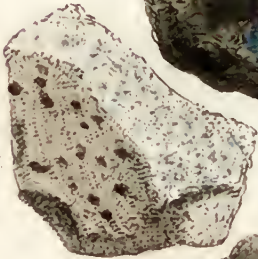
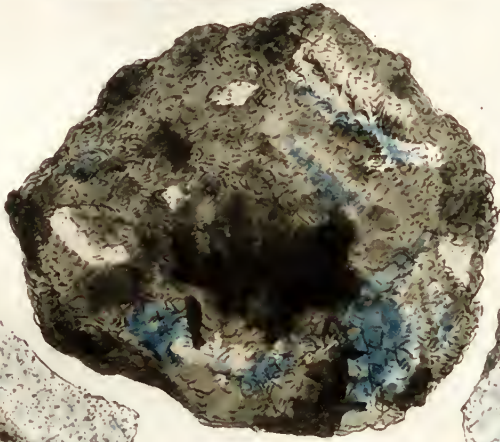
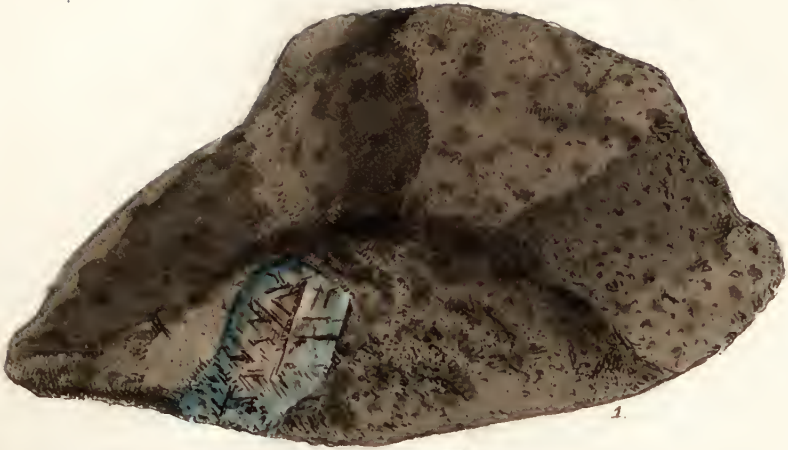
Chenevix has given two analyses; one of Fibrolite, from the Carnatic, the other of that from China; the proportion of iron in the latter is the cause of its having a reddish tinge.

Carnatic.		China.	
Silex . . .	38.	Silex . . .	33
Alumina . .	58.25	Alumina . .	46
Iron and loss	3.75	Iron . . .	13
	100.00	Loss . . .	8
			100

The figures of the larger fragments are from those in the British Museum; the smaller figure is from a specimen in a matrix of reddish granite from China: for this I am indebted to the kindness of Sir Joseph Banks, bart.







TAB. CVII.  
SILEX Haiiyi.  
*Hauyne.*

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- SYN. Haiiyne. *Neergaard Journal des Mines*,  
No. 125, p. 365. *Bournon Catal.* 47.  
*Aikin*, 215.  
Latialite. *Gismondi.* *Haiiy Tabl.* 62.  
Saphirin. *Nose.*
- 

THIS rare mineral is described as occurring in rhomboidal dodecahedrons, but I have not been able to meet with a specimen in which I could discover a single regular crystal. It generally assumes the form of rounded grains dispersed through the gangue: sometimes the grains are collected into small masses, and of these masses some parts are very pale blue, or even white, while other parts retain the blue colour in all its beauty. The variety among dark brownish-green Mica, accompanied by Meionite, &c. generally exhibits this arrangement. The variety from near Rome is generally composed of more or less insulated grains imbedded in a cellular stone, by some called Basalt, but which has much more the appearance of volcanic Scoria. The specimen I have figured of this, contains a large grain, or rather nodule, of a dull pale violet colour near the surface, and lilac in the centre: it has fortunately been broken through so as to exhibit not merely its foliated structure, but the position of its laminæ parallel to three sides of an obtuse rhomb: there are also sufficient indica-



tions of laminæ intersecting these, to prove that the nucleus is a dodecahedron with rhomboidal faces similar to that of Garnet.

Häiïne is equal in hardness to Quartz: the spec. grav. is from 3.100 to 3.333: it remains unchanged in colour, and is not melted by the action of the blow-pipe. Nitric acid allowed to remain upon its powder changes it into a white transparent jelly. The analysis by Vauquelin gave the following constituent parts:

Silex . . . . .	30.
Argilla . . . . .	15.
Lime . . . . .	5.
Potash . . . . .	11.
Oxide of Iron . . . . .	1.
Sulphate of Lime . . . . .	20.5
Sulphureted hydrogen, a trace	
Loss . . . . .	17.5
	<hr/>
	100.0
	<hr/>

We should not think the name a compliment to the penetrating crystallographer Häiïne, did not the scarcity of the substance in some measure represent the rare occurrence of such a comprehensive genius.

Fig. 1 a specimen from near Rome.

Fig. 2 the variety from the neighbourhood of Vesuvius, in a mass of Mica, with Meionite, Epidote, &c.: this is in the cabinet of G. B. Greenough, Esq.

Fig. 3 from Albano, mixed with a white substance, probably Feldspar, in Basalt, containing Augite and Mica.

Fig. 4, from the Laager See, in a mass composed of transparent grey crystals of Feldspar, with Augite and yellow Sphère. I am under obligations to Proff. Strömeyer for the specimens from which these two last figures are taken.

The geometrical figures shew the rhomb as displayed in fig. 1 and the dodecahedron resulting from a combination of all its fractures.





## TAB. CVIII.

## SILEX anthophyllithus.

*Anthophyllite.*


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Syn. Antophyllith. *Schumacher.*  
 Anthophyllite. *Hall's Tabl.* 58. *Bournon*  
*Catal.* 96. *Aikin,* 223.

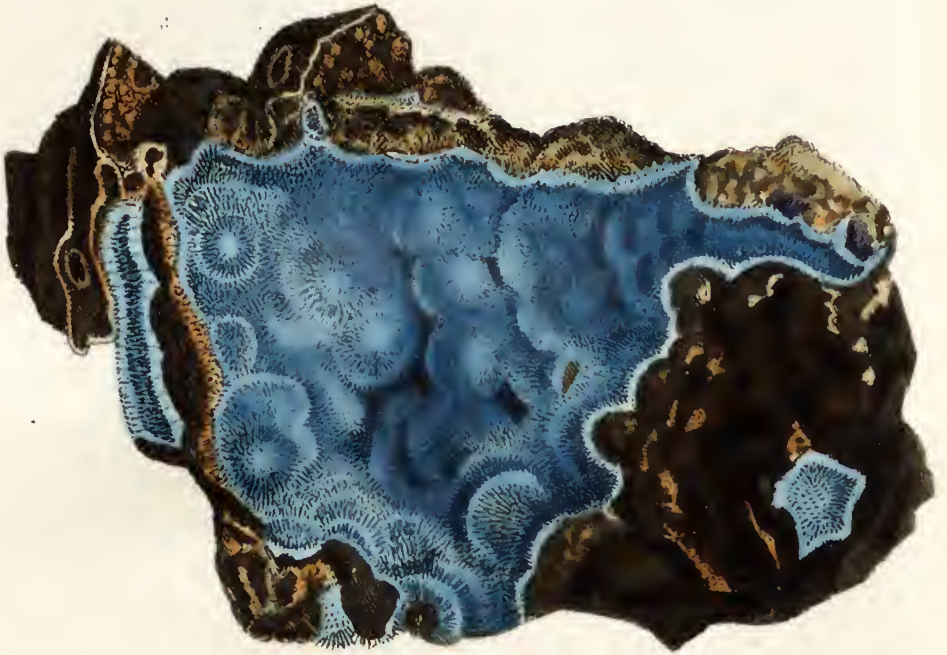
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A MINERAL nearly related to Hyperstein, but softer and more distinctly laminated; it was first found at Kongsberg in Norway, aggregated with Hornblende: its structure is sometimes radiated, but the variety I have figured is in irregular crystals, interrupting one another, and united into a mass; among them is a small portion of green Hornblende; it is from Kupferberg, in Bavaria, and was sent me with a collection of foreign minerals, by my valuable correspondent, Professor Strömeyer.

Anthophyllite is very distinctly foliated in one direction, and the surface of the laminæ displays a slightly metallic lustre; sections are easily obtained, perpendicular to the laminæ, producing the other sides of a rectangular prism, these are dull: indications of sections parallel to the diagonals of the prism are also visible, as fine shining lines, when the mineral is moved between the eye and a light. It is infusible, but becomes darker coloured when heated by the blowpipe; it is nearly as hard as glass; the spec. grav. is from 3.118 to 3.285.

John gives us the following analysis of the variety from Norway:

Silex	. . . .	62.66
Argilla	. . . .	13.33
Magnesia	. . . .	4.0
Lime	. . . .	3.33
Oxide of Iron	. . . .	12.
Oxide of Manganese	. . . .	3.25
Water	. . . .	1.43
		<hr/>
		100.00
		<hr/>



## TAB. CIX.

## CUPRUM velutinum.

*Velvet Copper Ore.*

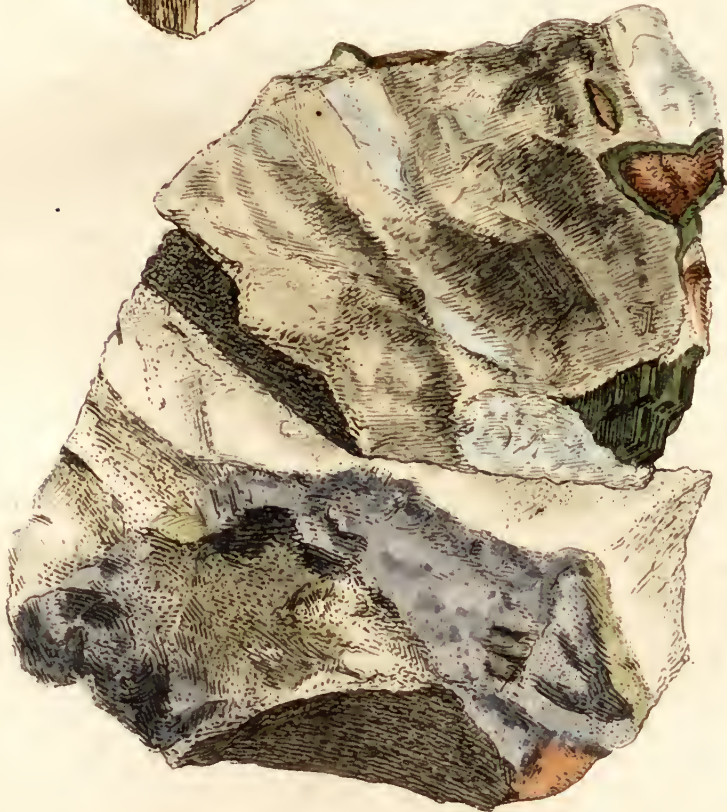

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SYN. Kupfersammterz. *Karsten Tab. 62. Werner.*  
 Velvet Copper. *Jameson's System, ed. 2.*  
 iii. 153.

---

**T**HIS splendid and valuable copper ore not having hitherto been analyzed, it is impossible to give it a correct name or place in the system; it is distinguished from other copper ores by its colour which is a pure rather pâle blue, and the extreme delicacy of its fibres, which gives it the lustre of velvet. It encrusts the surface of mammilated brown Ironstone; hitherto it has been found only at Oravicza in the Bannat, and is rare there. The British Museum is in possession of the fine specimen figured.

It has been conjectured, but I do not know upon what grounds, that it is a combination of Oxide of Copper with Silix.







TAB. CX.  
CERIUM fluatum.

*Yttrocerite.*

SYN. Yttrocerite. *Gahn and Berzelius in Thompson's Annals*, ix. 72.  
Double Fluuate of Cerium and Yttria. *Ib.*  
ix. 453.

FOR the discovery of the various minerals that contain Fluuate of Cerium, we are indebted to the researches of Gahn, Berzelius, Wallman, and Eggertz: they have been found in the neighbourhood of Fahlun, both in the mines of Broddbo and Finbo. The most abundant is that known by the name of Yttrocerite, and which appears to be a mixture of the Fluuate of Cerium and the Fluuate of Yttria, with Fluuate of Lime; the purple colour common to which it often possesses. The following description of this is extracted from Thompson's Annals:

“ Its colour is various, violet, greyish red, white, grey, often all mixed in the same specimen. In amorphous masses, varying in size from a thin crust to half a pound in weight, disseminated through quartz. Lustre glistening. Opake. Scratched by the knife and by quartz. Scratches Fluor spar. Spec. grav. 3. 447.

“ Before the blowpipe it loses its colour, and becomes white; but does not fuse of itself, but when mixed with Gypsum readily melts into a bead. When in fine powder it dissolves completely in boiling muriatic acid, and the solution has a yellow colour; its constituents are—

Lime . . . . .	47.63 to 50.00
Yttria . . . . .	9.11 to 8.10
Oxide of Cerium . . . . .	18.22 to 16.45
Fluoric acid . . . . .	25.05 to 25.45
	100.01 100.00
Or Fluuate of Lime . . . . .	65.162 to 68.18
Fluuate of Yttria . . . . .	11.612 to 10.60
Fluuate of Cerium . . . . .	23.226 to 20.22
	100.000 99.00

A Fluato of Cerium, crystallized in six-sided prisms, containing of fluato of protoxide of Cerium 30.43, and of fluato of peroxide of Cerium 60.00 has been found, but specimens have not reached England. Another fluato, holding double the quantity of Cerium, amorphous, and strongly resembling porcelain Jasper, is also mentioned. A fourth mineral, more common than either of these, consisting of a variable proportion of the fluates of Cerium and Yttria, occurs in the quartz in small nodules or surrounding, or even mixed with Gadolinite; it is so soft that it may be easily scratched by the nail: its colours are deep red, pale red, white, nearly yellow, or reddish brown: this is the double fluato of Cerium and Yttria above quoted; it is found at Finbo.

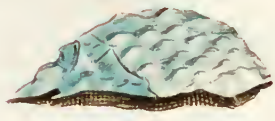
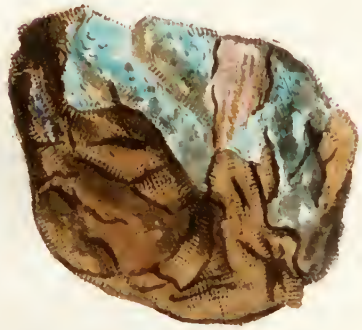
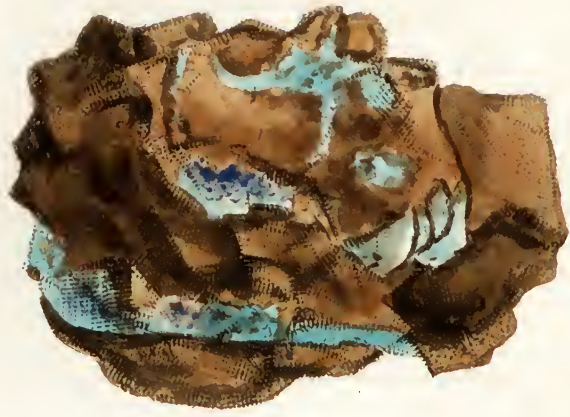
Besides the substances already mentioned in these minerals, there was discovered by Berzelius, in the deuto fluato of Cerium, in amorphous masses from Finbo, which is analogous to the crystallized kind before mentioned, a new earth agreeing in some of its characters with Zirconia, but differing in several others, especially in not being precipitated from its solutions by sulphate of Potash; this earth was also found in the double fluato of Cerium and Yttria, but its presence was not manifest in every specimen examined, and its existence could not be discovered by any effect it might have produced on the external characters. In the fifth volume of the *Afhandlingar i Fysik, Kemi oeh Mineralogi*, a full detail of these minerals, along with the other productions of the mines in the neighbourhood of Fahlun, is contained, together with an account of the properties of this new earth, which Berzelius proposes to name Thoria, from Thor, an ancient Scandinavian deity.

The upper figure represents a thin crust of the first mentioned fluato, called Yttrocerite, forming a film upon the surface of a fissure, in a mass of Pyrophyllite: this is from the British Museum.

The lowest figure is from an irregular mass of the same in white Feldspar, with Quartz and greenish Mica; lent me by John Dunston, Esq.

The other figure is from a rare specimen sent to the British Museum by Berzelius; it is the red kind, in some of which the Thoria has been discovered: it is a small reddish nodule, surrounded by green Mica, and imbedded in an aggregate of white Feldspar and Quartz.





TAB. CXI.  
ARGILLA allophanes.

*Allophane.*

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SYN. Allophan. *Strömeyer annalen der physik.*  
*J. 1816. St. 10. Thomson's*  
*Annals of Phil. ix. 244.*

---

THE specimens of this new mineral were communicated by Professor Strömeyer; they were found at Gräfenthal, near Saalfeld.

Allophane; so called from its deceptive aspect, arising from its situation and colour, whence it might be taken for an ore of Copper, and not an earthy mineral: occurs in a mammillated form, lining, or filling the hollows of a vesicular ochraceous Iron stone, and is accompanied by blue and green Carbonate of Copper. Its fracture is perfectly conchoidal, it is soft and very brittle; the external surface is dull: the lustre of the fractured parts is vitreous: it is transparent. The specific gravity varies from 1.852 to 1.889.

Strömeyer has given the following analysis, from which it appears to be an Hydrate of Argilla and Silex, coloured by Carbonate of Copper.

Argilla	-	-	32.202
Silica	-	-	21.922
Lime	-	-	0.730
Sulphate of Lime			0.517
Carbonate of Copper			3.058
Hydrate of Iron			0.270
Water	-	-	41.301
			<hr/>
			100.000
			<hr/>









## TAB. CXII.

## SILEX dipyrus.

*Dipyre.*


---

**SYN.** Dipyre. *Haüy* iii. 242. *Tabl.* 55.  
 Schmelzstein. *Werner.*  
 Dipyre. *Aikin*, 208.

---

**DIPYRE** has hitherto been found only in one place, where it was discovered so long ago as 1786, by Lelièvre and Gillet Laumont, on the right bank of the gave de Mauléon, in the Hautes Pyrenees, imbedded in a grey clayey earth, accompanied by green or white Tale and cubical Iron pyrites. It is either in very small prismatic crystals that are scattered through the gangue, or in small masses of a fibrous structure. The crystals are rectangular prisms, with two or four of their vertical edges truncated, so as to produce six or eight-sided columns: the ends appear to be uneven, at least I have not met with any that exhibit even faces. They are imperfectly transparent in some parts, and opaque in others, with a weak lustre, wherefore, they have a slightly pearly aspect: *Haüy* describes the longitudinal fracture as displaying laminae parallel to all the eight sides of the prism; the cross fracture is conchoidal. It is hard enough to scratch glass, but very brittle; the massive variety (see the lower fig.) has sometimes a loose structure. When slightly heated

it emits a faint light; before the blow-pipe it readily melts with intumescence into a semitransparent globule. The specific gravity is 2.630.

Analysis by Vauquelin.

Silex	-	-	-	60
Argilla	-	-	-	24
Lime	-	-	-	10
Water	-	-	-	2
				<hr/>
				96
				<hr/>





## TAB. CXIII.

## SILEX fulgens.

*Stilbite.*


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SYN. *Silex fulgens.* *Brit. Min. tabs.* 259 & 524.

*Strahl Zeolith.* *Werner.*

*Zeolithe rayonnée.* *Broch.* i. 301.

*Stilbite.* *Haiüy* iii. 161. *Tabl.* 48. *Aikin*  
209. *Bournon Catal.* 101.

---

**T**HE present specimen of *Stilbite* is a variety by no means uncommon, although not met with in the British islands; its beauty renders it interesting.

The crystals are in prismatic groups, curiously expanded at each end, but still retaining the general form of the elongated dodecahedron, exhibited at the top of the plate; the surface of the specimen beneath the *Stilbite* is encrusted with mealy *Zeolite* (or nearly pulverulent *Meso-type*); it is from *Ferro*.

1880-1881

1880-1881

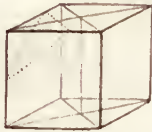
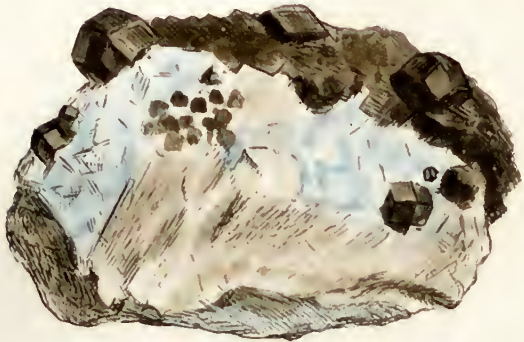
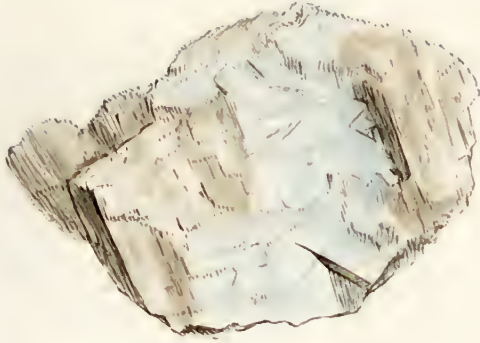
1880-1881

The first of the year was a very dry one, and the crops were much injured. The second of the year was a very wet one, and the crops were much injured. The third of the year was a very dry one, and the crops were much injured. The fourth of the year was a very wet one, and the crops were much injured. The fifth of the year was a very dry one, and the crops were much injured. The sixth of the year was a very wet one, and the crops were much injured. The seventh of the year was a very dry one, and the crops were much injured. The eighth of the year was a very wet one, and the crops were much injured. The ninth of the year was a very dry one, and the crops were much injured. The tenth of the year was a very wet one, and the crops were much injured.

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## TAB. CXIV.

## SILEX laminosus.

*Schaalstein.*

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- SYN. Schaalstein. *Werner.*  
 Tafelspath. *Karsten Tabl. s. 44.*  
 Spath en tables. *Haüy Tabl. 66.*  
 Tabular spar. *Aikin 183.*
- 

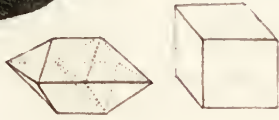
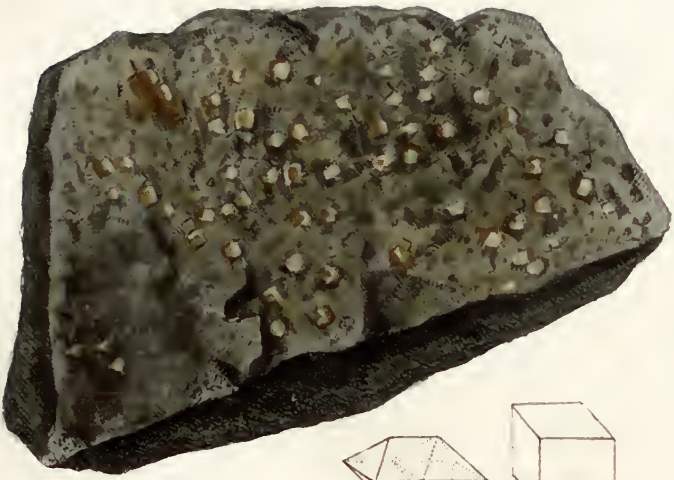
SCHAALSTEIN is well recognized by its foliated fracture, with laminae parallel to the faces of an apparently rectangular prism, and by falling to pieces after a slight effervescence in Nitric acid. Its analysis also places it at a distance from any other mineral that bears an external resemblance to it. Haüy speaks of fractures in the direction of the diagonals of the prism, parallel to the sides of which it most easily breaks (which, by the bye, he says is slightly rhomboidal) and of other oblique joints; but the cross fracture is so splintery, that it must be a difficult matter to ascertain them with precision. It is seldom translucent, and in general is full of minute cracks in every direction; it is soft enough to yield to the knife, but scratches glass. The spec. grav. is 2.86. It has been found in the island of Ceylon, accompanying the Cinnamon-stone (see tab. 83,) and at Dognatska in the Bannat, in foliated Limestone of a bluish colour along

with granular Hornblende of a light green colour and brown Garnets; specimens from this latter place have been selected for figuring.

The following is Klaproth's analysis:

Silex	-	-	-	50
Lime	-	-	-	45
Water	-	-	-	5
				<hr/>
				100
				<hr/>





## TAB. CXV.

## SILEX Melilithus.

*Melilite.*


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Syn. Mèlilite. *Delamètherie Théorie de la Terre*,  
2, 273. *Fleuriau de Bellevue*  
*Journal de Phys.* 51, 455.  
*Haiiy Tabl.* 64. *Aikin* 214.

---

THE most complete account of this mineral is given by Fleurian de Bellerne, and it seems to have been but little noticed by later mineralogists. It appears to constitute a considerable part of the mass of Lava, at Capo di Bove, near Rome, and with which the streets of Rome are paved; it manifests itself in the stone by its yellow colour, and upon the surface of fissures, in crystals; the larger ones are rectangular parallelograms; they are partly imbedded, and are often coated with an opaque lighter coloured crust; besides these, are very minute crystals, scattered almost loose over the surface, in the form of octohedrons composed of flattish pyramids joined by their rectangular bases, which are of a darker colour, but should seem to be of the same nature. They are accompanied by a variety of Nepheline, called Pseudonepheline, and minute crystals of magnetic Iron. Melilite is fusible, without ebullition, into a bottle green transparent glass; its powder thrown into nitric acid forms a jelly, but fragments only lose their colour, and become

porous and more difficult to melt. The primitive form appears to be a rectangular prism, parallel to the sides of which it may be split with some difficulty. Fleuriau observes, that the incidence of the faces of one pyramid of the octohedron upon those of the other appears to be  $115^\circ$  for one set, and  $70^\circ$  for the other; he has also observed the primitive crystal truncated upon two or four of its edges. We are not acquainted with any analysis.







## TAB. CXVI.

## ANTIMONIUM sulphureum.

*Sulphuret of Antimony.*

- 
- SYN. Antimonium sulphureum. *Brit. Min. t.* 365.  
 Antimoine sulfuré. *Haüy 4,* 264. *Tabl.*  
 112. *Bournon Catal.*  
 398.  
 Grau Spiesglaserz. *Werner.*  
 Grey Antimony. *Aikin 123.*
- 

**S**ULPHURET of Antimony has been found in Great Britain only in acicular crystals or foliated masses; in other countries it frequently occurs in large groups of well-defined crystals, such as that now figured, probably from Auvergne, which is lent me by my friend, Mr. Plasted. The lesser figures are intended to represent the plumose variety, or that in minute down-like fibres, and the Iridescent scopiform one. The former is among loose minute crystals of Quartz, upon Sulphate of Barytes; both are from Hungary.

The primitive form of this ore is by Haüy supposed to be an octohedron, divisible by three planes, which united together, would form a rectangular prism; the fractures parallel to this octohedron are very deficient in neatness and lustre, while two of the three that form the prism are tolerably well distinguished, and the third presents a surface equal to the most perfect mirror, and is very easily obtained in the longitudinal direction of the crystals; it is with good reason, therefore, that Bournon

has adopted this prism for the nucleus, independently of its being the simplest form; the proportions of the terminal faces to the height of the prism, has been determined by Bournon, to be as the numbers 24, 16.8, and 21. The pliability of this substance, first observed by Bournon, is analogous to that of crystallized Sulphate of Lime, and probably, like it, depends upon the proportions of the sides of the nuclei to each other.

I have given outlines of two crystals from the large specimen, and of a third out of a specimen from Wolfsberg, in the Hartz, by favour of Professor Herrmann: the latter is a rare modification to find complete; the commencement of it is shewn in one of the others.

The grouping of the crystals in the large specimen is rather whimsical; one small one in particular lying across the summit of another has been bent, and seems so placed on purpose to exhibit the character of pliability.



TAB. CXVII.  
 SULPHUR nativum.  
*Native Sulphur.*

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SYN. Sulphur nativum. *Brit. Min.* ii. 173. t. 190.  
 Soufre. *Hall's Tabl.* 68. *Bournon Catal.*  
 162.  
 Sulphur. *Aikin* 58.

---

CRYSTALLIZED Sulphur has hitherto not occurred in Great Britain, it becomes therefore a fit subject to figure in an appendix to British Mineralogy. I have selected for this purpose the most magnificent group of crystals ever brought to England; but as the mass upon which they repose is very broad, I have omitted a great portion of it, using principally the central parts, and condensing them a little. The crystals, although large, are not so remarkable for size as for their perfection and elegant distribution over a surface composed of acute crystals of Carbonate of Lime, covered by an opaque rough crust. It is the produce of a mine at Conilla, near Cadiz, which was opened many years ago by the King of Spain, for the express purpose of extracting a few of its magnificent treasures, with some of which the late Mr. Forster was indulged: the mine was immediately closed again, and I am told the works were destroyed by the French, while they blockaded Cadiz, towards the close of the last war. For the figure I am indebted to the liberality of Mr. Heüland, who now possesses the treasures above alluded to, and which I have often admired.

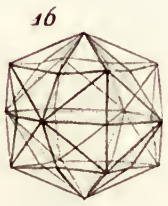
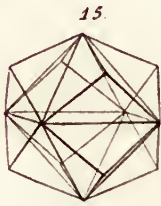
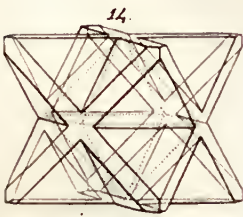
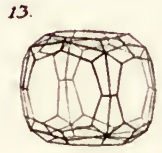
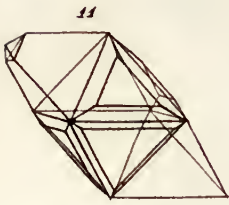
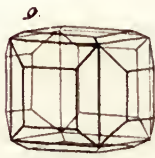
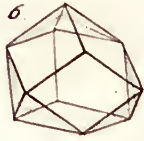
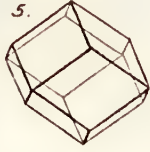
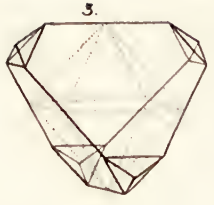
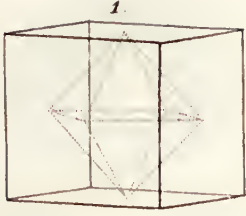












## TAB. CXVIII and CXIX.

## CARDO Adamas.

*Diamond.*

SYN. אֲדָמָס\* *Exodus* xxviii. 18. *Αδαμας* of the Greeks.

Adamas. *Plinius Hist. Nat. l. xxxvii. c. 4.*

Diamant. *Haiüy, iii. 287. Tabl. 69. Bourbon Catalogue raisonné des Diamants dans le cabinet de Sir Abraham Hume, bart.*

Diamond. *Kirw. 1, 393. Aikin, 58. Mawe's Travels in the Brazils, p. 137.*

OF all gems the diamond has, from the remotest ages, been the most universally and deservedly esteemed; of its first discovery in India little or nothing appears to be known, and the Mines of Golconda have been for centuries tributary to grandeur, and yet do not appear to be exhausted. Of late years an immense number of diamonds has been obtained from the Brazils, particularly from the bed of the river Jigitonhonha, in the district of Serra do Frio, and also from the Rio Plata. The diamonds are found in a kind of gravel, called Cascalhão, containing milky and other quartz pebbles, blackish fragments of Chert, magnetic Iron in minute grains, and Gold dust mixed with light coloured earth. Sometimes the pebbles are cemented together by brown oxide of Iron, in the

\* Either from אֲדָמָס (or אֲדָמָס) to emit light; or from אֲדָמָס to beat, as *αδαμας* is from *α* not, and *δαμασω* to subdue, from its invincible hardness (see Parkhurst's Lexicon): the former derivation is preferred by several learned Hebraists, as I am informed by Mr. Joshua Van Oven, who himself rather inclines to it.

form of a Breccia, that is distributed in rounded lumps among the gravel, and sometimes encloses gold and diamonds. The gems are usually minute, weighing frequently less than a grain; many are however found that weigh five or six carats; a few have been picked up of a much greater size, some of which have been cut, others are still kept rough. The largest of the cut ones is that mentioned by Tavernier, as belonging to the Great Mogul, it weighs 297 carats and nine-tenths; it is said that before it was cut it weighed 900: it was found in the middle of the sixteenth century, in the mine of Colore, near Golconda. Various other large diamonds are on record; the most curious is a sky-blue one, among the crown jewels of France, weighing 67 carats and two-sixteenths; but, perhaps, the most beautiful one is the Pit diamond, it weighs 136 carats. Daniel Eliason, Esq. has in London, a nearly perfect blue\* Brilliant, of  $44\frac{1}{2}$  carats, that is superior to any other coloured diamond known.

The finest rough diamond is probably one mentioned by Mawe, in his travels in the Brazils† as belonging to the Prince Regent of Portugal; it obtained the pardon of three Exiles, who found it in the bed of the river Abaité, in the interior of the Brazils: it is an octahedron, weighing seven-eighths of a troy ounce.‡

Diamonds have never yet been found in the rock, if it were a rock, in which they were first formed; they are always crystals, that are perfect all round, as if they had been deposited in a soft mass or fluid: the crystals are

---

\* Remarkable for so little of the purple, that paste which is liable to that tinge, cannot be found to imitate it.

† To this very interesting work I must beg to refer, for the particular account of the diamond mines, and the method of washing and picking the Cascalhao for them.

‡ There is in Sir Thomas Cullum's possession a glass model, curiously cut, with concave facets, said to be of a Brazilian diamond, in the Royal Cabinet at Lisbon, which weighed 1680 carats; its length is 4 inches, depth 2, and width  $2\frac{1}{2}$ : this stone has generally been spoken of as still uncut and is by most considered to be a Topaz.

rarely grouped two or three together, and except the primitive, a regular octahedron, they have almost constantly convex faces ; the faces are sometimes so convex, or the clusters of crystals so arranged, as to produce spherules.

The crystallization was but little known until Bournon's Catalogue of Sir Abraham Hume's collection was published, from which it appears that 20 modifications have been calculated, and 72 more pointed out: as many of these modifications differ from each other only a few degrees in the inclination of the planes they produce upon the primitive, it is evident that the succession of several of them will have the appearance of a single rounded face.

*Tab. 118.* Contains portraits of a series of diamonds, sufficiently extended to shew the general characters of their form and modifications, which are further illustrated by outlines in *Tab. 119.*

*Tab. 118. fig. 1.* A tetrahedron, with two angles truncated in its passage to the octahedron.

*Fig. 2.* An octahedron; diamonds of this form have flat faces with sharp edges, and generally polished; but some oriental ones are rough, as if corroded.

*Fig. 3.* A large irregularly crystallized diamond; some of the faces of this belong to the octahedron; it is of a fine water, and was the property of Messrs. Rundell and Bridges, who kindly permitted me to draw it, previously to its being cut into brilliant: it weighed 91 carats.

*Fig. 4.* A group of three minute octahedrons from Mrs. Mawe's cabinet. The upper fig. is magnified.

*Fig. 5.* An octahedron mackled.

*Fig. 6.* A cube, from the Grevillian collection; the primitive face remains in place of one of the angles.

*Fig. 7.* The passage from the octahedron towards the cube: an oriental diamond of Mrs. Mawe's.

*Fig. 8.* A dodecahedron with rhomboidal planes, from Mr. Heüland's collection.

*Fig. 12.* A short dodecahedron, with minute grains of a green substance, resembling Tale, adhering to the surface; this is a common occurrence, and seems to indicate that diamonds were deposited in a rock, resembling amygdaloid, belonging to the Floetz-trap formation.

*Fig. 9.* A similar dodecahedron, mackled upon a plane passing through six of the faces of the dodecahedron and the axis, and parallel to a face of the octahedron: some portions of the faces of the primitive remain, and form re-entering angles. Mr. Heüland.

*Fig. 13.* In this diamond the planes of the dodecahedron occur upon the angles of the tetrahedron; other facets are also seen upon the angles. From Mrs. Mawe.

*Fig. 10.* A pearly opaque diamond, an octahedron, the upper half of which is modified in the same way nearly as fig. 17.

*Figs. 11, 17, and 18.* Three modifications differing in the angle, each consisting of 24 faces, placed over the edges of the octahedron, and inclined towards the angles. Fig. 18 is depressed; this diamond possesses the remarkable property of absorbing the sun's rays, and retaining them sometime after it is removed into a dark place, so appearing luminous; a property frequently absent \*

*Fig. 15* is of the same form as fig. 18, but it is perforated by two holes, and has also a considerable rugged cavity on each side, as if some other substance had formerly adhered to it. From the British Museum.

*Fig. 21.* A similar diamond; in one side of this is a large brown ferruginous speck, which, if worn out, might leave a hollow similar to the one in the last. This appears

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\* Possibly the diamond in Aron's breast-plate possessed this quality, which might give rise to the hebrew name.

to be of a deep brown colour ; but it is probable the colour is borrowed from the speck. Mrs. Mawe.

*Fig. 16.* The same modification as number 11, united with the cube ; coated with a green substance.

*Fig. 22.* A fine yellow diamond in the form of an acute rhomb, with various modifications. Mr. Heüland.

*Fig. 19.* Similar to fig. 17 ; elongated in the same way as fig. 22, and in a greater degree.

*Figs. 20 and 23.* Octahedrons modified by the application of obtuse trihedral pyramids upon their faces, producing two facets upon each edge, inclined towards the centres of the primitive faces.

*Fig. 24.* An oriental diamond.

*Fig. 25.* A diamond included in ferruginous breccia, or pudding-stone.

*Fig. 26.* A very fine well crystallized diamond, shewing one of the many modifications not calculated by Bournon that produce four faces upon each edge of the primitive, inclined from each other : a single black speck near the surface is seen reflected several times over.

*Fig. 27.* Two diamonds united together ; the last mentioned modification is completed in these, forming an obtuse six-sided pyramid upon each face of the octahedron. The same modification occurs in Nos. 24 and 25.

Nos. 25, 26, and 27, as well as Nos. 34 and 35, are among Mr. Heüland's treasures ; for the loan of them I feel much indebted.

*Fig. 28.* A triangular table, produced by the mackling of two very flat crystals, modified like No. 26.

*Fig. 29.* Similar to No. 27, with the addition of the faces of the cube.

*Fig. 30.* May be described as two tetrahedrons with truncated edges, crossing each other, or as a cube with a deep notch in each edge ; in the latter point of view it belongs to the first modification described by Bournon, as

producing re-entering angles. It is a very rare form ; the crystal was in Mr. Mawe's possession when I sketched it, but the gentleman who afterwards obtained it from him, has most unfortunately lost it.

*Fig. 31.* A trihedral pyramid is applied upon each face of the octahedral nucleus of this crystal ; the pyramids are so high, that their faces incline towards each other ; they meet upon the edges of the octahedron. This is the second of Bournon's modifications with re-entering angles.

*Fig. 32.* The faces described in No. 31, in this are combined with those of the cube and octahedron ; along the edges of the latter they form furrows. This crystal helps to explain No. 30.

*Fig. 33.* This pretty octahedral crystal, after having undergone the modification upon its edges, like No. 11, has had hexahedral plates applied upon its faces, with their edges inclined towards each other, in consequence of their decrease being less rapid than that which produces the rhomboidal face of the dodecahedron.

I am under obligations to Mrs. Mawe for the sight of this uncommon form, as well as for Nos. 28, 29, 32, and 37.

*Fig. 38.* The octahedron included within this large crystal has first the faces of the cube upon its angles, and those of the dodecahedron upon its edges : plates have afterwards been applied partially upon the faces of the cube, and extended over those of the octahedron, so as to produce four deep notches upon each face of the cube, and a furrow over each face of the dodecahedron. This and No. 36, are from the Grevillian collection at the British Museum.

*Fig. 37* is of a similar form, with the facets rounded into each other.

*Fig. 36.* A group of two very rugged crystals of a



similar form. Each crystal of this group, as well as No. 38, was formerly considered as a group of eight others. In the same way *figs.* 30 and 31 might be taken for groups of eight modified tetrahedrons around an octahedron.

*Figs.* 35 and 34 are supposed to be clusters of minute crystals. Such diamonds are called diamonds of nature by the jeweller, who can make but little use of them in consequence of their irregular hackly structure.

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### TAB. CXIX.

*Fig.* 1. The primitive included in a cube, see *figs.* 6 and 7, tab. 118. Bournon's 20th modification.

*Fig.* 2. The primitive mackled, see *fig.* 5, *ib.* This mackle has often several modifications applied to it; see *fig.* 28, tab. 118.

*Fig.* 3. A modified tetrahedron, see *figs.* 13 and 22 tab. 118, and *figs.* 11 and 15 of this plate.

*Fig.* 4. A regular dodecahedron: the nearer diamonds are to this form the better they are suited to the purposes of the glazier. Bournon's 2d modification.

*Fig.* 5. A shortened dodecahedron; the narrow or shortened faces are parallel to a regular hexahedral prism.

*Fig.* 6. The same as the last; mackled upon a plane perpendicular to the sides of the hexahedral prism.

*Fig.* 7. The cube and dodecahedron together.

*Fig.* 8. A 6-sided pyramid placed upon each face of the octahedron, with planes inclined along the edges and towards the angles of the octahedron: see *figs.* 11, 15, 17, 18, and 21, tab. 118. The 14th to the 19th modifications of Bournon.

*Fig.* 9. The same united with the cube: see *fig.* 16, tab. 118.

*Fig.* 10. A 3-sided pyramid placed upon each primitive face, so obtuse as to produce two facets upon

each edge, inclined from the edge towards the centre of the face of the octahedron. Bournon gives six modifications analogous to this, his 2d. 3d. 4th. 5th. 6th. and 7th.; see figs. 20 and 23. tab. 118.

*Fig. 11.* Two tetrahedrons applied to the opposite faces of an octahedron, to explain fig. 22. tab. 118.

*Fig. 12.* Six-sided pyramids placed upon the octahedron, producing four facets upon each edge: see figs. 24 to 28, tab. 118.

*Fig. 13.* The same joined with the cube: see fig. 29.

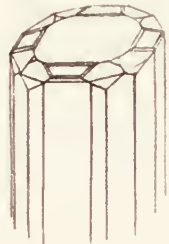
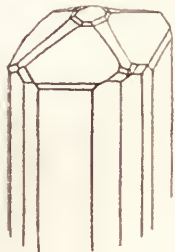
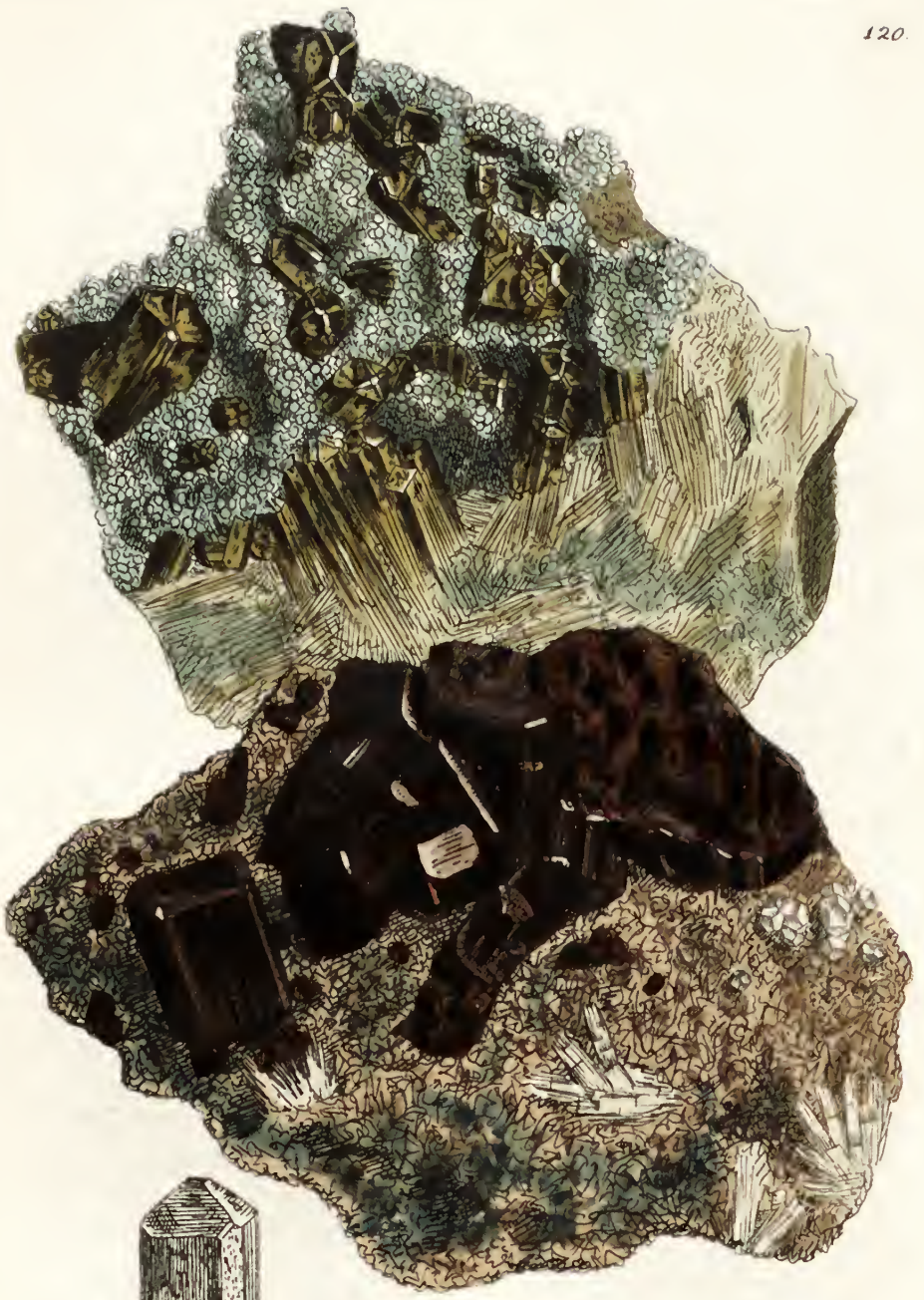
The remaining figures are to illustrate figs. 30, 31, 32, 33, and 38, of tab. 118, consisting of modifications that produce hollow angles, and notches or furrows upon the edges. Figs. 14, shewing Bournon's 8th modification, being the production of a regular tetrahedron placed upon each face of the nucleus: in the other modifications the pyramids added to each face are lower than the tetrahedron, but higher than those producing the modifications before noticed.

The analysis of the diamond having been performed by several experienced chemists, and among others by my much lamented friend, Smithson Tennant, Esq. has proved it to be nearly pure Carbon. Mr. Tennant proved that by uniting it with iron it produced steel, and that by combustion with nitre it produced the same quantity of carbonate of potash, that an equal weight of pure charcoal or coak would do.

Its hardness will distinguish it from every other substance, as it will scratch every other gem, and cannot be scratched by any thing except another diamond.

The statement of Pliny, that it will resist the blow of a hammer, although exaggerated, holds good when the diamond is struck in a direction contrary to that of its laminæ, but if struck upon the edges or angles of the primitive form, or nucleus, it easily splits, exhibiting brilliant flat faces. The spec. grav. is about three and a half times that of water.





## TAB. CXX.

## SILEX Idocrasis.

*Idocrase.*


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SYN. Silex Idocrasis. *Brit. Min.* 4, 133, t. 371.

Idocrase. *Hall's Tabl.* 34. *Bournon Catal.*

43. *Aikin*, 224.

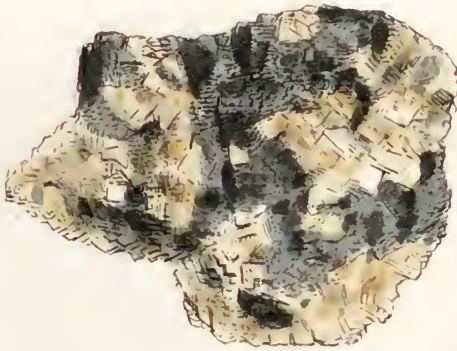
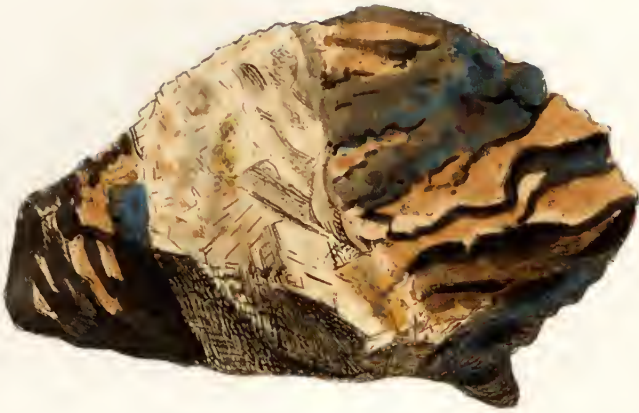
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SUCH brilliant specimens of Idocrase I believe are not to be found in any other than Mr. Heüland's cabinet. The Irish variety, figured in *British Mineralogy*, is so unlike these, that they would hardly be recognized as the same species, were not intermediate varieties, often before us. The green specimen is from Ala, in Piedmont; it is accompanied by green mica: the other from Locana, in the same country.

I have added a single crystal from Wilui, Baikal: it approaches in dullness to the Irish, but is of a greener and more intense colour.









## TAB. CXXI.

## ANTIMONIUM Niccoliferum.

*Nickel-Antimony.*


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SYN. Antimoine sulfuré nickelifere. *Haüy, Lucas* ii. 471. *Vanquelin Annales du Mus.* xix. 52.

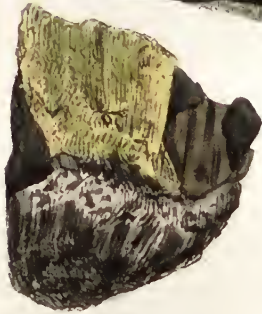
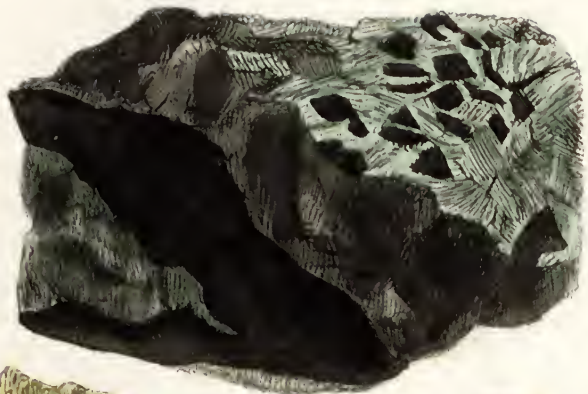
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**NICKEL-ANTIMONY** was first sent to Haüy by Mr. Hovel, previous to the year 1812. It was examined by Ullman, whose experiments were confirmed by Klaproth, and it has ever since been considered as a distinct mineral, although Vanquelin suspects that it is a mixture of an ore of nickel, with sulphuret of Antimony. It approaches in colour nearly to sulphuret of Antimony, being a little redder, and has its foliated structure but disguised by an uneven granular texture. Vanquelin observes, that the most remarkable circumstance attending this ore, is the absence of Cobalt, which generally accompanies nickel. It is found near Freussbourg, in Nassau, in a gangue of spathose Iron, with Copper pyrites, Quartz, and Galena. I received it from Prof. Strömeyer. The specific gravity, according to Vanquelin, is 5.65. Klaproth found in 8 parts, 4 of Antimony, 2 of Nickel, 1 of Iron, and 1 of Sulphur. Vanquelin says it contains half of Antimony; that the next greatest quantity is Nickel, then Arsenic, Sulphur, and Iron, in the order

they are named in ; and a very minute portion of Lead.  
John gives us the following analysis :

Antimony, with Arsenic	61.68
Nickel - - -	23.33
Sulphur - - -	14.16
Silica, with Silver and Lead	0.83
And a trace of Iron	-
	<hr/>
	100.00





TAB. CXXII.  
 CERIUM oxyferriferum.  
*Allanite or Cerine.*

---

SYN. Cerium oxyferriferum. *Exot. Min. t. 58.*  
 Cerine of the Swedish Mineralogists.

---

**T**HIS variety of Allanite, for it appears to be no other, has been known but a short time; it occurs in flat elongated black crystals, that shoot irregularly into the copper pyrites, or among the fibrous Hornblende, that accompanies the Cerite (see tab. 25.) found at Riddarhytta, in Westmannland, in Sweden.

The crystals are seldom well defined, but they will, upon a careful inspection, be found to be rhomboidal prisms, with two broad sides, the obtuse angle seems to be a few degrees less than 120, they may be distinguished readily by their uneven fracture in all directions, and the total want of laminæ, from Hornblende.

Mr. Hisinger has given the following analysis\* :

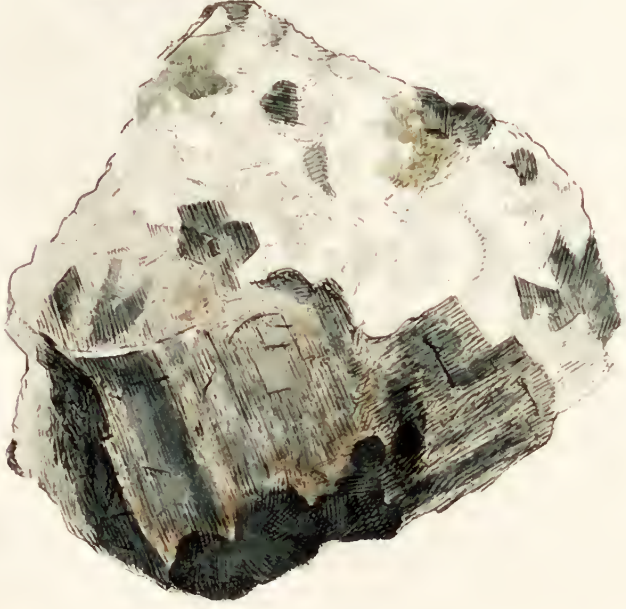
Silica	-	-	30.17
Alumina	-	-	11.31
Lime	-	-	9.12
Oxide of Cerium			28.19
Oxide of Iron	-		20.72
Oxide of Copper			0.87
Volatile matter	-		0.40
			100.78

---

\* See Thomson's Annals, ix. 78.









## SILEX Zoisii.

*Zoisite.*

SYN. Zoïsite. *Werner and Karsten. Haiiy Journal des Mines, No. 113, p. 465. Tabl. 44. Bournon Catal. 67 & 68. Aikin 223.*

---

**Z**oïsITE, so named in honour of Baron Von Zoïs, having been described as a new mineral by Werner and Karsten, has, by several authors, at the head of whom is Haiiy, been referred to Epidote: still, however, mineralogists seem unsettled; and while some consider the difference of lustre and colour as important characters, others, laying aside these, seek for a radical distinction in the form of the nucleus: thus Bournon doubts whether the terminal plane of the prism be perpendicular to the sides. Bournon also notices what he considers a characteristic difference in the proportions of Silex and Iron contained in it. Without venturing an opinion until further researches shall make us better acquainted with the substance, I give a figure from an authentic specimen sent me by Prof. Strömeyer: it was obtained from Fichtelberg, in Bareuth: the crystals shoot through a large grained white Granite, in which the Feldspar predominates: the Feldspar is often interposed between the laminae of the Zoïsite.

I add, also, a representation of a substance from Scotland, I think from Glen Elg, nearly resembling the Zoïsite, but less regularly foliated, and of a more waxy lustre, characters by which it approaches to Diallage: it is in a matrix of white compact Feldspar.

Analysis of Zoisite from the Alps, by Klaproth :

Silex . . . . .	45
Alumine . . . . .	29
Lime . . . . .	21
Oxide of Iron . . . . .	3
Loss . . . . .	2
	<hr/>
	100

Analysis of Zoisite from the Valais, by Laugier :

Silex . . . . .	37
Alumine . . . . .	26.6
Lime . . . . .	20
Oxide of Iron . . . . .	13
Oxide of Manganese . . . . .	0.6
Water . . . . .	1.8
Loss . . . . .	1
	<hr/>
	100





## TAB. CXXIV.

CALX phosphata, (*var.*)*Compact Phosphate of Lime or Phosphorite.*


---

SYN. Phosphorite. *Werner.*

Gemeiner Phosphorit. *Hausm. s. 123.*

*Karsten, s. 52.*

Chaux phosphatée Terreuse. *Haiiy, II. 239. Tabl. 8.*

Apatite,  $\gamma$ , massive. *Aikin, 172.*

---

THE Spanish massive variety of Phosphate of Lime has been known many years, and valued for its phosphorescent quality when heated: if closely examined it is found to be composed of dull luminæ arranged in the form of feathers, or diverging from numerous lines branching through the mass, but betrays no external character that would lead any one to consider it related to the crystallized Phosphate or Apatite, although its analysis shews it to be essentially the same. It is found in a considerable bed near Lagrofan, in Estremadura, Spain. Another variety is found at Schlackenwald in Bohemia; it is vespicular, in some parts semitransparent, and appears to be composed of irregular crystals collected together into a mass; among them some traces may be perceived of the hexahedral prism. Pulverulent Phosphorite has been found at Marmarosch, near Sigeth, in Hungary, and I have been told in some part of England, but I cannot learn where.

Pelletier and Donadei have given the following analysis of the variety from Estremadura, which shews it has some admixture, as is commonly the case with amorphous substances :

Lime . . . . .	59
Phosphoric acid . . .	34
Fluoric acid . . . . .	2.5
Carbonic acid . . . . .	1
Muriatic acid . . . . .	0.5
Silex . . . . .	2
Iron . . . . .	1
	<hr/>
	100.0

The pulverulent variety from Hungary gave Klaproth the following ingredients :

Lime . . . . .	47
Phosphoric acid . . . .	32.25
Fluoric acid . . . . .	2.5
Silex . . . . .	0.5
Oxide of Iron . . . . .	0.75
Water . . . . .	1
Quartz and argillaceous matter . . . . . }	11.5
Loss . . . . .	4.5
	<hr/>
	100.0







## TAB. CXXV.

SILEX mesotypus, *var.* natrolithus.*Mesotype, or Natrolite.*SYN. Natrolith. *Werner, &c. Haiiy Tabl. 64.**Bournon Catal. 107.*Mesotype  $\gamma$  (Natrolite.) *Aikin, 212.*

THE peculiar colour of this variety of Zeolite caused it to be taken for a new species; and its being found by Klaproth to contain 16 per cent of Soda, that opinion was confirmed in the minds of several eminent mineralogists. Mr. Smithson having since found 17 of Soda in Mesotype, and the form of the spiculæ of Natrolite being the same as the crystals of Mesotype, there appear to be no longer any solid grounds for giving that mineral a higher rank in the system than that of an elegant and distinct variety.

Of the specimens figured one is from the British Museum, and another was presented to me by Prof. Strömyer. They all come from Hohentweil in Swabia. It fills fissures in clink-stone porphyry. It is also said to occur in one or two of the western isles of Scotland.

Analysis by Klaproth:

Silex . . . . .	48
Alumine . . . . .	24.5
Soda . . . . .	16.5
Water . . . . .	9.0
Oxide of Iron . . . . .	1.75
Loss . . . . .	0.25
	<hr/>
	100.00

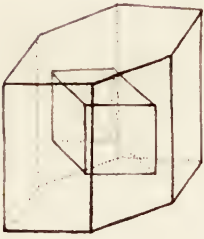




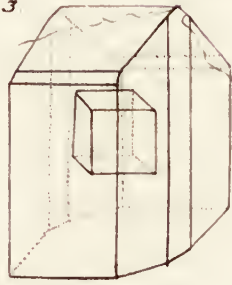
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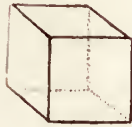
2.



3.



4.



TAB. CXXVI.  
 SILEX Wollastoni.  
*Wollastonite.*

---

**T**HIS mineral appears to be known from only one specimen, which was in La Metherie's collection, and passed along with it into the hands of Mr. Heüland. Having free access to the rarities in this gentleman's possession, I have taken an early opportunity of making known the general appearance of an unique specimen, leaving the more minute detail to one or two friends who have commenced the investigation, and who will I hope obtain some knowledge of its composition, and favour the world with the result of their labours. In the mean time the following observations may serve to assist the figure:— It has much of the aspect of white tremolite, but is more compact, and in shorter bars. The crystals are thick prisms of six, eight, or more sides: four of the sides are larger than the rest, and so placed, that if alone they would form a prism of about 87 and 93 degrees: this prism is divisible with ease in the direction of its short diagonal, producing a brilliant face, and is also foliated parallel to two of its sides: the cross fracture is between conchoidal and hackley: it possesses various degrees of transparency, with a low degree of lustre: it yields with difficulty to the edge of a knife, dividing into fibres mixed with powder. One of the crystals exposes two terminal faces, inclined upon that face of the prism parallel to which the crystal is foliated: these, if accurately measured, may lead to the knowledge of the integrant molecule. The specimen is from Capo di Bové, near Rome.

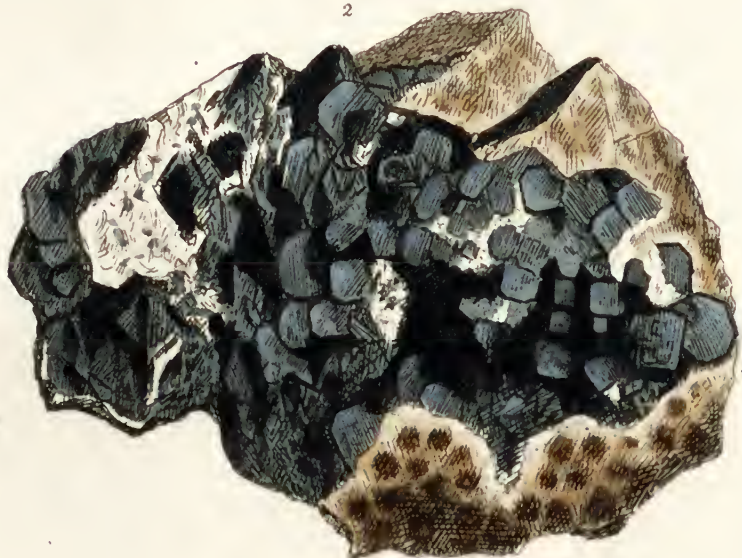




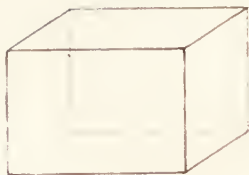
1



2



3



4



5





## TAB. CXXVII.

## TELLURIUM plumbiferum.

*Foliated or Plumbiferous Tellurium.*

- SYN. Nagyagerz. *Emmerling II.* 463. *Werner.*  
 Tellure natif (*var.*) aurifère et plombifère.  
*Haüy IV.* 327.  
 Tellure natif auro-plombifère. *Haüy Tabl.*  
 119.  
 Tellure lamelleux. *Bournon Catal.* 447.  
 Black Tellurium. *Aikin,* 141.

---

**T**HIS variety of native Tellurium appears to be the most abundant, and at the same time the most impure; nevertheless it preserves, according to Bournon, to whom we are indebted for a full account of the crystals of all the varieties of Tellurium, the characters of the primitive form, and shews the structure of the crystals most perfectly. The primitive form of native Tellurium is not according to that acute crystallographer, an octahedron, as Haüy from imperfect specimens was led to conclude it to be, but a rectangular prism, whose height is to its width as 7 to 10.

Foliated Tellurium is found among Quartz, and pale rose-coloured Carbonate of Manganese in veins in porphyry, at Nagyag in Transylvania: it is sometimes accompanied by Yellow Tellurium, which is distinguished by its brittleness, and by Blende. The specimens represented are in the British Museum.

Analysis by Klaproth :

Tellurium . . . . .	32.2
Lead* . . . . .	54
Gold . . . . .	9
Silver . . . . .	0.5
Copper . . . . .	1.3
Sulphur . . . . .	3.0
	<hr/>
	100.0

---

\* The Lead although considerable in quantity seems only to loosen the aggregation of the molecules of the Tellurium, without so combining with them as to form new molecules, and produce a specific distinction : it is probable, also, that the proportion is variable.





TAB. CXXVIII.  
URANIUM oxidulatum.  
*Suboxide of Uranium.*

- SYN. Pecherz. *Werner.*  
Pech-Blende. *De Born. Catal. de Raab*  
*II. 159.*  
Urane oxidulé. *Haiiy IV. 280. Tabl. 113.*  
Urane oxydé noir. *Bournon Catal. 420.*  
Pitch-Blend. *Aikin 138.*

**T**HE mineral before us, is that combination of Uranium in which Klaproth first discovered the metal he found afterwards in a higher state of oxidizement in Uranite. It may be known from all other minerals by its deep brown black colour, hardness, opacity, dull lustre, the absence of a regular foliated structure, its weight, the spec. grav. varying from 6.3785 to 7.5. and its infusibility.

One specimen was given me by Prof. Strömeyer, the other by Mr. Herman: they are both from Johannegeorgenstadt: the matrix is chiefly brown Iron-stone and Iron Pyrites: one is mixed with Cobalt and Blende, the other with Galæna.

A variety of Asphaltum accompanies the Uranite in some of the Cornish mines, which has been taken for the suboxide of Uranium, but it may soon be recognized by its softness and combustibility.

Klaproth's analysis of Pitch-Blende is,

Suboxide of Uranium . . .	86.5
Sulphuret of Lead . . .	6
Oxide of Iron . . . . .	2.5
Silex . . . . .	5.0
	100.0









## TAB. CXXIX.

## CARBO fragilis.

*Anthracite, or Stone Coal.*

- 
- SYN. Carbo fragilis. *Brit. Min. tabs.* 410 & 49.  
 Plombagine charbonneuse, Anthracolithe.  
*De Born. Catal. II.* 296.  
 Kohlenblende. *Wid. s.* 653.  
 Carbon loaded with stony matter. *Kirwan,*  
*II.* 57.  
 Anthracite. *Haiiy, III.* 307. *tabl.* 69.  
*Bournon Catal.* 164.  
 Blind Coal. *Aikin* 60.  
 Glanz kohle. *Werner.*
- 

**T**HERE are two principal varieties of Stone Coal; one that occurs in large beds or strata, connected in general with bituminous Coal, the bitumen of which being dissipated by some causes associated with the introduction of Whin Dykes through the strata, has left the Carbon in the form of Coak, of Plumbago, or of the bituminous Coal itself: the other variety occurs in small quantities in mineral veins traversing Gneiss, Mica Slate, and Transition Rocks: we have no means of tracing the origin of this variety from animal or vegetable substances, but it may possibly result from the decomposition of bitumen, such as is found in some of the copper veins of Cornwall: that it was once more bulky than at present is evident from the number of cracks that pervade it,

and which are often filled with iron pyrites, or other foreign matter; to this variety the name **Anthracite** appears to have been originally attached: I do not know that it has been met with in any part of Great Britain. At **Kongsberg**, in **Norway**, it is found upon **Quartz**, accompanied with **Carbonate of Lime**, **Fluor**, native **Silver**, &c. **Bournon** mentions a specimen from this place, in which the **Anthracite** is both pulverulent and in globules, as if it had run into that form. The mine at **Kongsberg** is said to be in **Mica-slate**. It is found also in **Spain**, **Switzerland**, the **Hartz**, and **Schemnitz** in **Hungary**.

The specimen figured is part of a vein of **Iron-stone**, containing much **Quartz**, crystallized in the hollows, which contain besides the **Anthracite**, specular **Iron** and **Iron Pyrites**. It is one of **Prof. Strömeyer's** kind favors: it was collected at **Lerbach**, in the **Hartz**.





TAB. CXXX.  
 ARGILLA cruciformis.  
*Staurotide.*

---

SYN. Argilla cruciformis. *Ex. Min. t. IX.*  
 Staurotide. *Haiiy, Tabl. 43. Bournon*  
*Catal. 76.*  
 Staurolite. *Aikin, 189.*

---

THE cruciform variety of this mineral has already appeared in this work; in the description of it, mention is made of the substance occurring in Scotland: British Mineralogy being concluded without a figure of it, I have added one here, along with the red kind in single crystals, from St. Gothard; it is the dark grey specimen: I am indebted to the Rev. P. Forbes for it, who found it in Mica slate at Boharm, in Elginshire. The same gentleman favoured me with some masses of Cyanite, from the same place, in which were a few minute crystals of Staurotide of a red colour, and transparent like that from St. Gothard; the masses also contained Quartz, Mica, and decomposing Feldspar. St. Gothard has hitherto produced the most perfect specimens, as the crystals in them are sharply defined with various modifications upon their ends; have some transparency and a clear colour. The cruciform variety on the other hand often exhibits larger crystals, but they are rough, and of a dull colour, being mixed with the substance of the rock they are imbedded in, which is a grey micaceous slate (see tab. IX.) The grey specimen from Scotland presents

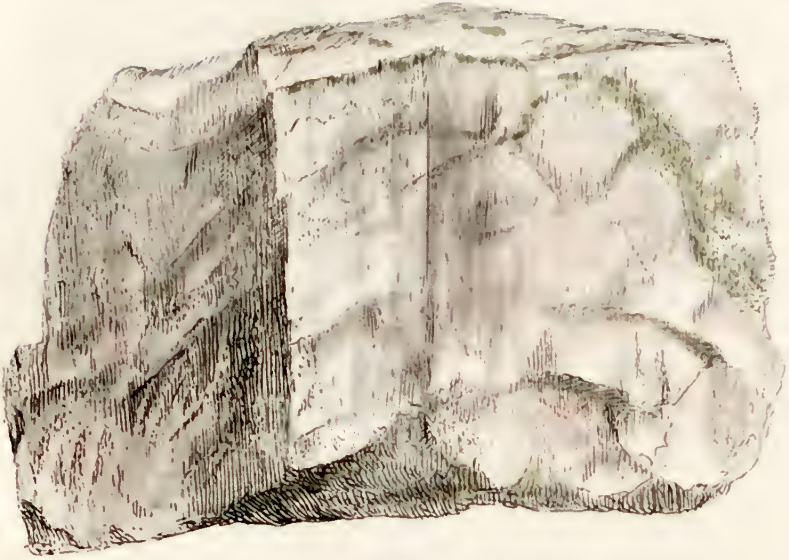
a still less pure variety, which retains none of the red colour of the unmixed substance, and in which the crystals are thin and badly defined: they do not appear to cross each other in pairs, but run in all directions through the Mica slate they occur in. Crossed crystals of Staurotide have been found by Dr. Fitton, in a micaceous compound at Glenmalur lead mines, in the county of Wicklow,\* but it does not appear to be common.

An enlarged figure of two crystals, with wedge-shaped terminations, crossing each other obliquely, is added at the bottom of the plate from a specimen found in Brittany.

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\* See Geological Trans. Vol. I. p. 275.







TAB. CXXXI.  
SILEX petalithus.  
*Petalite.*

---

SYN. Petalitte? *D'Andrada, Journal de Physique*  
51, 244.

Berzelite. *Clarke in Annals of Philosophy*  
XI. 365.

---

MR. D'ANDRADA gave an account of a new mineral in the 51st volume of the *Journal de Physique*, to which he gave the name *Petalitte*.\* this mineral remained unknown to English mineralogists until Mr. Swedenstierna sent a considerable quantity of a substance, much resembling rose Quartz, to London, under that name. Mr. Swedenstierna also sent it to Dr. Ingle, at Cambridge, where it was analyzed by Professor E. D. Clarke and the Rev. Mr. Holme, and found to be sufficiently distinct from Quartz. Dr. E. D. Clarke, however, doubts whether it be really the *Petalitte* of D'Andrada, and wishes to call it *Berzelite*. At present we must abide by the authority of the Swedish mineralogist. The eye may distinguish it from Quartz by its inferior lustre; by the uneven appearance of the cross fracture, and by a tendency to divide in certain directions, with flat spining faces, that may be readily discovered. These divisions, according to Dr. E. D. Clarke, are parallel to the sides of a rhomboidal prism, whose obtuse angle equals  $100^{\circ}$ . My specimen exposes surfaces of laminæ, parallel to a four-sided prism of about  $86$  and  $94^{\circ}$ ; these surfaces are

---

\* M. D'Andrada's description does not precisely agree with the mineral before us, which can hardly be called, "en masses qui sont des réunions de pièces séparées, grenues;" neither is its spec. grav. above 2.620.

equally shining, but not very bright; they are a little curved, which may cause them to give a different measure from that assigned by Dr. Clarke. Fractures are also visible in several parts in the direction of the long diagonal of the base of this prism; they produce surfaces of considerable brilliancy, but of less extent than those of the prism, upon which they are equally inclined. Dr. Clarke found the specific gravity of a nearly white specimen to be 2.45. : he also found that by a long continuance of an intense heat from a blow-pipe, the surface was glazed, and became full of minute bubbles. The colour varies from white to a pale rose colour; the whiter varieties have often a tinge of grey: when breathed upon it emits a peculiar odour, less suffocating than that of argillaceous Limestone. It is found accompanying Spodumen, Quartz, Mica, &c.

The analysis by Mr. Arfredson, a pupil of Berzelius's, has afforded one of the most extraordinary results obtained for some years; it has proved the existence of an alkali before unknown, which resembles Soda in some respects; but its salts differ in many properties from those of either of the fixed alkalies, particularly in their easy fusibility. This alkali has received from its discoverer the appellation Lithion, or, Lithina, to denote its origin in the mineral kingdom.

Analysis by Arfredson.*	By Clarke.†	By Holme.†
Silica . . . 80	. . . 80	. . . 76 $\frac{2}{10}$
Alumina . . . 17	. . . 15	. . . 20 $\frac{2}{10}$
Lithina . . . 3	Manganese 2.50	. . . 2 $\frac{2}{10}$
	Water . . . 0.75	. . . 0 $\frac{10}{10}$
	Loss . . . 1.75	. . . 0
100	100.00	100 $\frac{2}{10}$

\* Annals of Philosophy, Vol. II. p. 291. † Ib. Vol. II. p. 198.





## TAB. CXXXII.

## MOLYBDENUM oxygenatum.

*Oxide of Molybdenum.*

- 
- SYN. Molybdänocher. *Karsten, tabellen s. 70.*  
 Molybdène oxydé. *Bournon, Catal. 424.*  
 Molybdena-Ochre. *Jameson, ed. 2. Vol.*  
*III. p. 494.*
- 

**T**HIS is a rare and little known mineral ; it is recognized by its situation among sulphuret of Molybdenum, by the decomposition of which it seems to be produced : it varies in colour from pale yellow to a delicate green, and is generally in the form of a compressed powder. The specimen figured is from Bitsberg, in Sweden. Jameson relates that " it is found investing and intermixed with Molybdena, in the granite of Corybuy, at Loch Creran, and at Nummedalen, in Norway."









## TAB. CXXXIII.

FERRUM carbonatum, (globosum.)

*Carbonate of Iron, Sphærosiderite.*


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 SYN. Sphærosiderite. *Strömeyer.*

 Ferrum carbonatum. *Brit. Min. t. 517.*

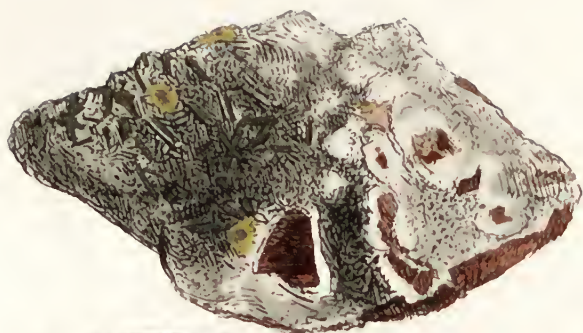

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SPHÆROSIDERITE, so named from its globular form, is a remarkable variety of spathose Iron ore. The spheres which frequently intersect and unite with each other, are composed of diverging radii, and exhibit the foliated fracture, characteristic of the species; they are contained in the hollows of a mass, composed principally of the same substance. Professor Strömeyer, to whom I am indebted for specimens, has found it to be pure carbonate of Iron: it is found at Steinheim, near Hanau.

A fibrous variety of the same substance has been sent me by Mr. Rashley, from Cornwall, since the conclusion of British Mineralogy: it occurs in veins traversing chlorite slate, in Tincroft mine. I have added a figure of it.







TAB CXXXIV.  
 VISMUTHUM sulphureum.  
*Sulphuret of Bismuth.*

---

- SYN. Wismuth Glanz. *Werner.*  
 Sulphurated Bismuth. *Kirwan II.* 266.  
 Bismuth sulphuré. *Häüy IV.* 190. *Tabl.*  
 105. *Bournon Catal.* 377.  
 Sulphuretted Bismuth. *Aikin* 121.
- 

**S**ULPHURET of Bismuth is an old well-known, but not abundant mineral; its form and brittleness distinguish it from native Bismuth, and its lighter steel grey colour, inclining to yellowish, from Sulphuret of Antimony. Its easy fusibility is also a useful character; a fibre of it melts as soon as it comes in contact with the flame of a candle. The form of its nucleus, according to Häüy, is a slightly rhomboidal prism, divisible in the direction of its short diagonal: this section produces a brighter face than those of the prism, and is more readily perceived. Bournon has determined the primitive form to be a rhomboidal prism of  $60^\circ$  and  $120^\circ$ : the crystals that afforded the Count the means of ascertaining this point, were very small and thin plates; but well defined and brilliant, and shewed the fracture parallel to their edges, and also in the direction of their diagonals: such crystals are extremely scarce.

The spec. grav. according to Brisson, is 6.4672, or Kirwan 6.131.

Saye obtained from it 60 per cent. of Bismuth and 40 of Sulphur.

It has been found in Bohemia, Saxony, Sweden, and according to Aikin, in Herland mine, Cornwall.









## TAB. CXXXV.

## SODA borata.

*Borax.*

- 
- SYN. Borax and Tincal. *Kirwan 2, 37.*  
 Soude boratée. *Haiiy 2, 366. Tabl. 20.*  
*Lucas, pt. 2. p. 88.*  
 Borate de Soude, Borax. *Bourn. Catal. 193.*  
 Baurach of the Arabs. Tinckal of the Indians.
- 

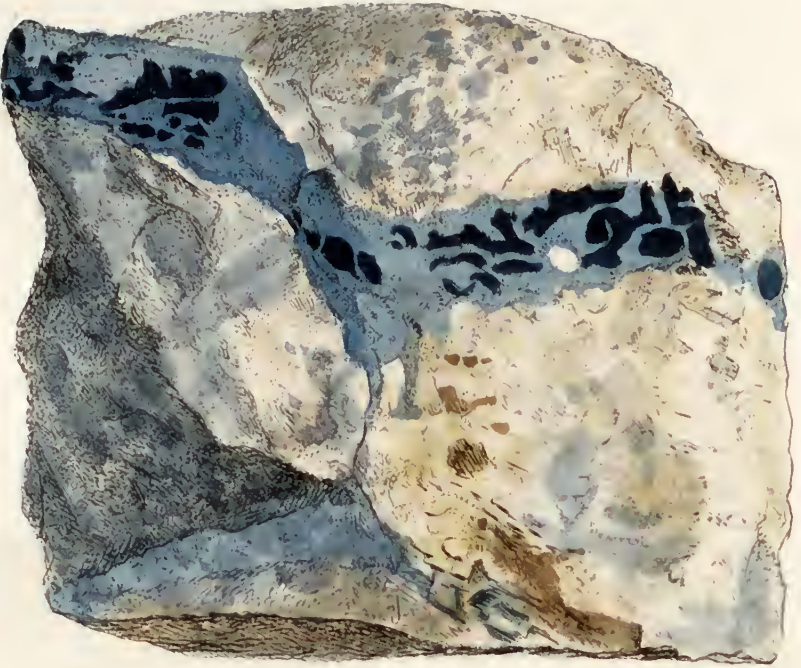
**T**HIS useful salt has been imported from the East for the use of metallurgists and Jewellers for a long time, and yet its natural situation in the earth was unknown to Europeans until the latter part of the last century. The first correct account of it is given in the 2d volume of the *Annales de Chimie*, p. 299; where M. Saunders states, that it is dug from the sides of a lake, 15 days journey N.W. of Tissoolembo in Thibet: this lake is 20 miles in circumference; its waters are nearly at the same level at all seasons: it has no river running from it, but has several salt springs that supply the evaporation: it is frozen over during a great part of the year, so as to prevent the workmen from obtaining the salt. The nature of the rocks that surround the lake we are not acquainted with; but the springs from them contain much Muriate of Soda besides Borax. It is probably the constant evaporation of the water of these springs from the surface of the lake, that causes the Borax to be deposited in its bed as fast as the workmen can dig it. Several other lakes and low pieces of ground, that were formerly lakes, both in Thibet and Persia, afford abundance of Borax; it is collected in impure masses and

imbedded crystals, which are preserved from efflorescing by a coat of soapy matter: it is sold in the Indian markets by the name of Tinckal. When purified it assumes the appellation of Borax, from its Arabic name. It occurs also in China, Ceylon, and Saxony. The mines of Viquintipa, those in the neighbourhood of Escapa, in Potosi, have furnished a considerable supply to the native Americans, who have used it to assist in smelting the ores of copper which are abundant in that district: it is by them called Quemason, a term nearly synonymous with Flux.

Haüy describes the crystals as derived from a rectangular prism; while Bournon observes, that the base of the primitive is perhaps somewhat different from a right angle; and says, that the suite of crystals in his (now the King of France's) collection is sufficient to demonstrate what the primitive is.

The large crystals before us are from Persia; one of them is not cleared from the crust of soap with which it was preserved. The small crystals are probably artificial; they are in the state in which they were imported from India.





## TAB. CXXXVI.

## SILEX pruinosus.

*Siderite.*

SYN. Sidérite. *Bernhardi et Trommsdorff*,  
*Journal des Mines* 27, 447.

Quartz-résinite bleu grisâtre. *Lucas*, pt. 2,  
p. 512.

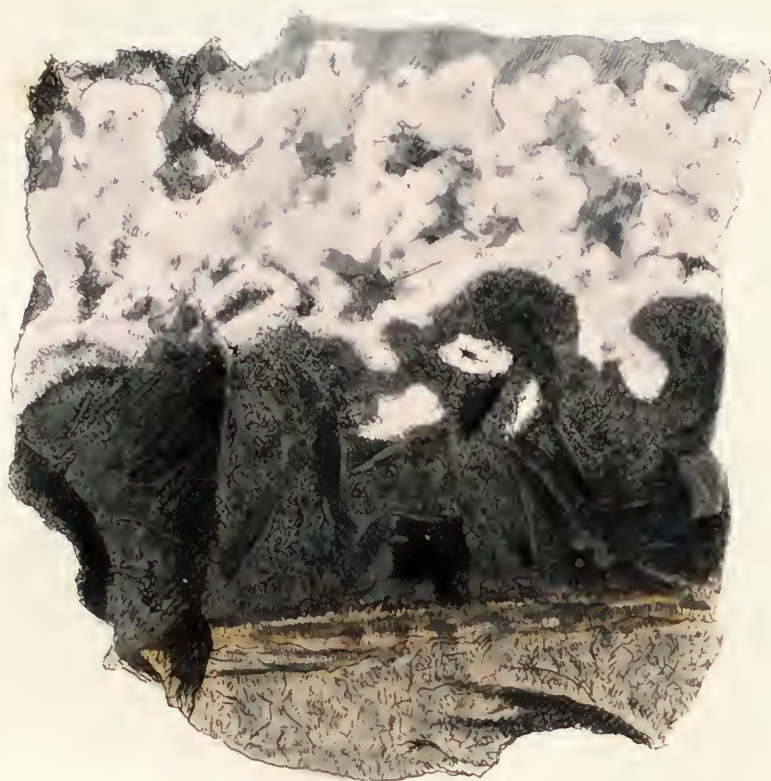
**T**HIS mineral is evidently a mixture of two species; whether either of them be a variety of one already known is at present uncertain. The dark blue veins consist of a substance resembling the variety of Quartz distinguished as Semi-opal, of a mamillated form, but of a very different colour, and more transparent. Among this, especially upon its surface, is a pale blue pulverulent substance, which is the colouring matter of the Quartz-like part, the strength of tone being the effect of the transparency. In many parts the blue substance exhibits a scopiform fibrous structure; and where this structure is most distinct, the internal fibres of each bundle are found sometimes of a deep green colour, possessing some transparency, and a degree of hardness sufficient to resist the knife: hence it is evident, that the blue substance results from the disintegration of a mineral related to Actinolite or Tremolite. The blue colour is not destroyed by acid. The matrix, which has hitherto been called Granular Gypsum, is Carbonate of Lime in rhomboidal crystals, with convex faces, whose angles approach nearly to  $90^\circ$ : from the slow effect of acids upon them it appears that they contain Magnesia. The interstices between the crystals are filled in the opener

parts with white Lithomarga : in the more compact parts there is a good deal of the fibrous substance in minute specks, and in its unchanged state, of a dull green colour : there are also a few specks of Copper Pyrites.

This compound mineral has sometimes been referred to Dicroïte, but I have not been able to observe a difference of colour, by looking through it in different directions ; and as it does not occur in crystals, there do not appear to be sufficient grounds for their union : there is, however, much analogy ; and it is highly probable, that Dicroïte, Siderite, and Prasem, will all one day be found to be similar combinations, but of different species, with Quartz.

Siderite has only been found in the vicinity of Golling in Salzburg







## TAB. CXXXVII.

## TELLURIUM auro-plumbiferum.

*Yellow Tellurium.*

- 
- SYN. Or Gris jaunâtre. *De Born.* 2, 464.  
 Tellure natif aurifère et plombifère. *Haiiy*  
 4, 327. *Tabl.* 119.  
 Tellure gris. *Bournon Catal.* 449.  
 Yellow Tellurium. *Aikin* 140.  
 Weiss Sylvanerz. *Werner.*  
 Gelberz. *Karsten.*
- 

**Y**ELLOW Tellurium is found in the same vein in Porphyry as the foliated Tellurium, tab. 127; it is distinguished from it by its colour, brittleness, and acicular or prismatic form; the form, however, sometimes approaches to tabular, and it has been found, but rarely, in octohedrons, with their angles more or less deeply truncated. Most authors agree in making the different ores of Tellurium, varieties of native Tellurium, and Bournon has found the primitive form of each to be the same.

The specimen before us contains, besides the yellowish grey needles of yellow Tellurium, a mixture of foliated Tellurium, with Sulphuret of Manganese, among Quartz and rose-coloured Carbonate of Manganese, upon a part of the clay-stone Porphyry rock which the vein traversed.

The following is the analysis of this ore by Klaproth :

Tellurium . . . . .	44.75
Gold . . . . .	26.75
Lead . . . . .	19.50
Silver . . . . .	8.50
Sulphur . . . . .	0.50

---

100.00

I am indebted to Mr. Heüland for the use of this specimen.







## TAB. CXXXVIII.

SILEX axinimorphus, *var.* scintilans.*Spinthere.*


---

SYN. Spinthère. *Haiiy* 4, 398. *Tabl.* 67. *Lucas*, *pt.* 2, 238.

---

**T**HIS is an ambiguous mineral ; the form of the crystals is more symmetrical than is usual in Axinite, and they are softer and have less lustre than the common kinds : these circumstances may naturally be caused by an admixture of Lime as well as Chlorite in them. Haiiy and Lucas appear to be uncertain whether Spinthere be only a variety of Axinite, while Bournon and other eminent Mineralogists are decidedly of opinion that it is nothing else. It is found in small very oblique rhomboidal prisms, the three obtuse edges of which are commonly displaced by dissimilar narrow faces. The terminal planes are commonly so large that the crystals look like very obtuse rhombs ; but sometimes they are so small, that the crystals are rather tall prisms, the acute edges of which being truncated, they become six-sided : this happens in minute crystals that are often grooped together. The scintillating appearance observed by Haiiy is produced by a number of minute facets parallel to the faces *g g* in his fig. 240, pl. 86, which are the same as two of the smaller faces upon my figure.

The Spinthere rests upon primitive crystals of Carbonate of Lime, which are covered with a crust of Chlorite that also penetrates those of the Spinthere ; it is accompanied by cubes of Iron Pyrites. It has only been found at Maromme, in the department of the Isère in Dauphiny.









TAB. CXXXIX.  
 PETUNSE globiferus.  
*Globular Feldspar.*

- SYN. Porphyre Napoléon. *Rampasse.*  
 Feldspar Globeux. *Lucas, pt. 2, 151.*  
 Roche porphyroïde globuleuse. *Faugas de*  
*St. Fond, Géologie, 2, 245.*  
 Porphyre globuleux, *ib. 2, 683.*  
 Amygdaloïde porphyroïde. *Brongniart*  
*Journal des Mines, 34, 41.*  
 Pyroméride globale. *Haiiy, in a memoir*  
*by Mr. Monteiro, Journal des Mines 35;*  
*347 et 407.*  
 Globular Porphyry, vulg.

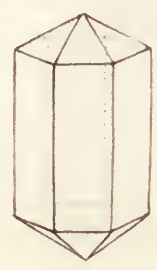
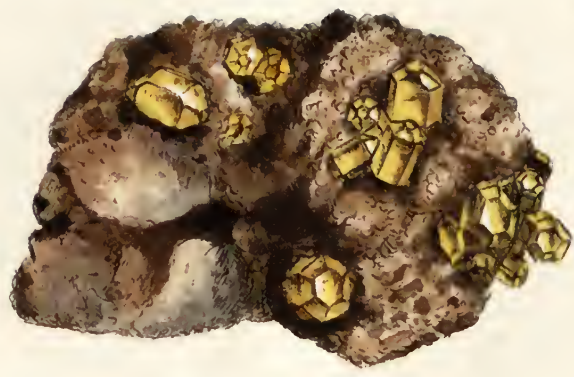
MR. Rampasse, during a fruitless search after the original situation of the Orbicular Sienite, in the mountains of Corsica, about 1805, met, between Monte-Pertusato and the valley that leads to Santa Maria la Stella, with a block, resembling porphyry, but in place of crystals of Feldspar, it presented globose aggregations of that substance, composed of diverging bars, enclosed in a compact coat; the basis consisting of compact Feldspar, in small masses and grains, cemented together by a substance of a much darker colour, which seems to be a kind of impure Quartz, similar to the variety known by the name of Hornstone, and which often acts as the basis of true Porphyries. The Quartz also fills up the minute interstices between the bars of Feldspar in the balls. Some years afterwards Mr. Mathieu was so fortunate as to discover the same kind of rock in its original repository, in the form of large veins, projecting like immense walls from the mountains of true Porphyry, that they

traversed, but which being of a looser construction, had weathered away before them. The district in which these veins occur is bounded on the north by Marzolino, on the south by Bussaggia; it comprises the country of Ozani and also Girolata, an extent of about eight square miles and a half, composed of barren mountains. The balls are found in several places in abundance, separated from the rock as at Bocca-Vignola and at Elbo. Much variety is observable in the colour and proportion of the parts of this curious rock; in some veins the balls are only a few lines in diameter; in others they are three or four inches: in some the basis is of a deep red, and the balls pale, with specks of red; in others the colour is more uniform, and the cement is in some abundant, in others hardly distinguishable. Besides the Feldspar and Quartz, this rock does not appear to contain any mineral except a few crystals of cubic oxide of Iron, of a dark colour, and brown oxide, which modifies the colour of the basis, and renders the parts where it abounds more liable to disintegration. The Feldspar in no part exhibits the foliated structure of crystals, but is every where compact and opaque, while the cement is in parts translucent, and, according to Monteiro, crystallized in some of the fissures. Respecting the origin of the rock little can be said with any degree of certainty; the arrangement of the parts seems to be the effect of a kind of imperfect crystallization, similar to what is produced frequently in Scoria and Glass, when kept some time in a certain temperature, and then cooled suddenly.\* The infusible nature of the substance in which the Feldspar has shot, renders the idea of the igneous formation inapplicable, and obliges us to imagine some solvent of Silix, in which the Feldspar might crystallize. A similar observation will apply to many other rocks, whose formation is concealed by that veil of mystery, through which we admire the works of Omnipotence, without being able to discover the instruments they have been wrought by: an innate desire in man to remove this veil, is a source of industry, conducive to his happiness; and every advance he makes serves to expose the difficulty of the task, and by displaying new wonders, increase his desire for knowledge, and enlarge his ideas of the incomprehensible Author of All.

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\* The formation of globes of a radiated structure is, by Watts, supposed to be the first step towards the formation of Basalt.





## TAB. CXL.

## PLUMBUM arsenio-phosphatum.

*Arsenio-phosphate of Lead.*

- 
- SYN. Muschliches and Fasriges Phosphorblei.  
*Karsten, tabs. 68, 69, and 99.*  
 Plomb phosphaté arsenié. *Haiiy 3, 496.*  
 Plomb phosphaté arsenifère. *Haiiy Tabl. 83.*  
 Plomb phosphaté. *Bournon Catal. 349.*
- 

BEAUTIFUL yellow crystals of Phosphate of Lead, holding much arsenic acid in combination, were discovered some years ago at Johanngeorgenstadt, in Saxony, and have ever since been much admired. Different opinions exist respecting the propriety of considering them as of a distinct species from Phosphate of Lead, along with a mamillated variety found at Rosiers, in the département of Puy de Dôme, which is similar in composition to it. Haiiy and Bournon consider the arsenic acid as accidental; the first inclining to an opinion that the arsenic acid is united with a portion of Lead, and mixed with the Phosphate in the form of Arseniate of Lead. Whether it be a combination, or only a mixture, will long remain a question.

The gangue of the specimens figured is granular Quartz, stained upon the surface with oxide of Iron.

Analysis of the yellow crystals from Johanngeorgenstadt :

	By Laugier.	By Rose.
Oxide of Lead . . . . .	76.8	77.5
Phosphoric acid . . . . .	9.0	7.5
Arsenic acid . . . . .	4.0	12.5
Water . . . . .	7.0	Muriatic acid 1.5
Silex Alumine and Iron	1.5	
Loss . . . . .	1.7	1.0
	<hr/>	<hr/>
	100.0	100.0

Analysis of the mamillated variety from Rosiers :

	By Fourcroy.	By Klaproth.
Oxide of Lead . . . . .	50	76
Phosphoric acid . . . . .	14	13
Arsenic acid . . . . .	29	7
Oxide of Iron . . . . .	4	Muriatic acid 1.75
Water . . . . .	3	0.5
		Loss . . . . . 1.75
	<hr/>	<hr/>
	100	100.00

The action of the blowpipe, with charcoal, readily points out the nature of a doubtful specimen, by dissipating the arsenic in fumes with the scent of Garlic, leaving the Phosphate of Lead in a faceted button of opaque glass.







## TAB. CXLI.

## PLUMBUM Scheelatum.

*Scheelate of Lead.*


---

SYN. Bleischeelin (scheelsaures oxydulertes Blei.  
Tungstate of Lead. *Heiland in Annals of  
Philos.* 12, 454.

---

THE present mineral was communicated by H. Heiland Esq. as a new ore of lead, from Zinwald in Bohemia, with the German name Bleischeelin, and supposed to have been examined by Prof. Lampadius. I have not yet met with any published account of such a mineral,\* or any analysis of a lead ore containing scheelie (Tungstie) acid : it is at present too rare in this country to admit of its being examined chemically, except by the aid of the blowpipe, and the number of experiments that an accidentally detached crystal has afforded, even with that instrument, have been but few. When first exposed to the flame it decrepitates; when powdered, it melts upon chareoal into a black slaggy brittle globule, without exhibiting any traces of lead; but with soda and elhareoal it is reduced to the metallic state, with borax it acts much in the same way that molybdate of lead does, producing with a small portion an opaque white globule mixed with blue clouds, which upon the addition of more borax becomes transparent, and of a pale brown colour. As the molybdate of lead is easily reducible upon chareoal, the result of the first experiment seems sufficient to dis-

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\* Except De Lametherie's name for Molybdate of Lead.

tinguish them. The forms most common to scheelate of lead are elongated square prisms, square acute pyramids generally truncated and double pointed four-sided crystals whose sides are curved, and the points sometimes truncated, the terminal angles of the pyramids are in some instances replaced by small brilliant facets, from the enlargement of which would result acute octahedrons, and indeed there are upon the specimen two minute octahedrons so produced, with flat shining faces and sharp points. None of the crystals exhibit a foliated structure internally, but are ragged upon the surface, with sparkling facets parallel to the modification last mentioned. The internal fracture is ragged without much lustre. The acute form of the crystals distinguishes them from the more usual ones of Molybdate of Lead; but I have seen similar ones among the masses of tabular crystals of that species from Carinthia; they, however, are immediately reduced to Lead upon Charcoal.

The gangue of Scheelate of Lead is Mica, upon crystals of Quartz, with Scheelate of Iron (Wolfram) in hexahedral prisms, composed of concentric coats. Mr. Heüland has one specimen besides that figured; it is of a darker colour, and the crystals assume more the form of spiculæ.





## TAB. CXLII.

SILEX Datholithus, (var. botryoides.)

*Botryoidal Datholite, or, Botryolite.*


---

SYN. Silex boratum, siliciferum. *Ex. Min.* 21.

Botryolith. *Hausman, s.* 122.

Chaux boratée siliceuse concrétionnée mamelonnée. *Haüy Tabl.* 17.

Botryolite. *Aikin* 174.

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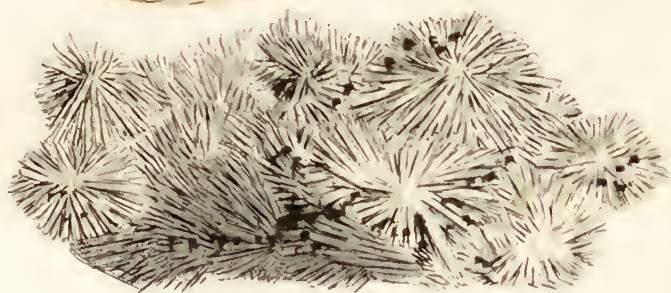
**T**HROUGHOUT the mineral kingdom each species is found to occur under several various general forms, with few exceptions; in many the different forms may be traced from one to the other; but in some they are very dissimilar and without any intermediate link; of the latter class are the two leading varieties Datholite, which have been looked upon as distinct species by many Mineralogists, although they are not more dissimilar than many varieties of Carbonate of Lime, &c. are to each other: but external form cannot be admitted as a specific distinction, since it is so variable in substances of the same composition. The mammillated, or botryoidal Datholite, is composed of concentric coats of diverging fibres, closely compacted together, and forming a dull smooth surface. It is found in the Kjenlie Mine, near Arendal, in Norway, from whence the specimen figured was brought.

The matrix of the specimen figured is chiefly Carbonate of Lime, with Quartz, Hornblende, and green Phosphate of Lime.

From the British Museum.









## TAB. CXLIII.

STRONTIA carbonata.

*Carbonate of Strontia.*


---

SYN. S. carbonata. *Brit. Min. tab.* 65.

Strontiane Carbonatée. *Hall's Tab.* 15.

Strontian. *Werner. Aikin* 166.

---

**T**HE variety of Carbonate of Strontia, exhibited in the upper figure upon this plate, is very unlike that given in British Mineralogy, and so much like in its contour to Carbonate of Lime, that it becomes truly interesting; the fracture, however, displays a surface and lustre very different. It is from the Leogang, in Salzburg, and is very rare.

Mr. Heiland's cabinet.

The lower figure is an attempt to picture the beautifully white and brilliant variety from Braunsdorf, in Saxony, which is accompanied with Iron Pyrites, upon Carbonate of Lime. The modifications upon the crystals are probably the same as upon the above specimen; but the faces upon the edge of the prism are so much enlarged as to form acute pyramids.







## TAB. CXLIV.

## TELLURIUM argento-auriferum.

*Graphic Tellurium.*

- 
- SYN. Aurum graphicum. *De Born.* 2, 470.  
 Tellure natif graphique. *Haiiy*, 4, 326.  
 Tellure natif auro-argentifère. *Haiiy Tabl.*  
 119.  
 Tellure graphique. *Bourn. Catal.* 451.  
 Native Tellurium  $\alpha$ . *Aikin*, 140.  
 Graphic Tellurium. *Nonnul.* Graphic  
 Gold. *vulg.*  
 Schriftez. *Werner.*
- 

**T**HIS is the only kind of Tellurium hitherto unfigured in this work. It is the most showy species, but not the rarest. Its crystals approach nearest to those of Native Tellurium, see tab. 64.; and are arranged against one another so as to form the frame-work, as it were, of hexahedral or trihedral tables, and various other forms, which have led to the idea of the primitive crystal being an octahedron. It occurs upon the surface of Quartz, in fissures in a grey porphyry, that contains also Pyrites, Blende, and native Gold. Offenbanya, in Transilvania, is the only country that has produced it.

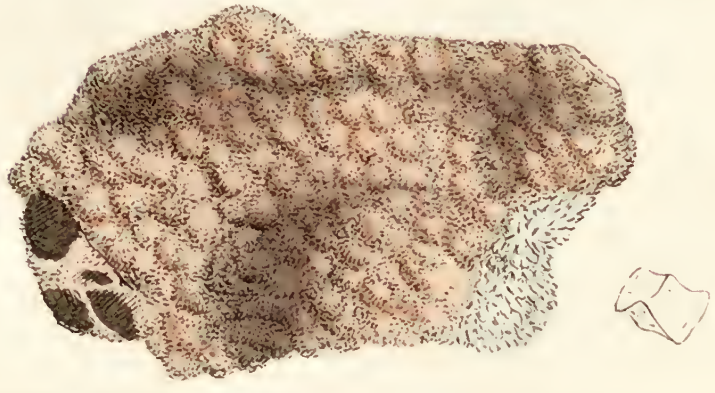
Klaproth obtained from 100 parts :

Tellurium . . . . .	60
Gold . . . . .	30
Silver . . . . .	10

---









## TAB. CXLV.

## MANGANESIUM carbonatum.

*Carbonate of Manganese.*

SYN. Manganèse oxydé carbonaté. *Hall's Tabl.*  
III.

Rothbraunsteinerz. *Werner?*

**T**HIS species has by most authors been confounded with Brownspar; and several who have separated it from that, have united with it the Lithoïde Manganese of Siberia, a variety of Feldspar, a British specimen of which is figured in *British Mineralogy*, (tab. 536.) Brownspar sometimes occurs of a dull rose colour, but never so bright as the rhomboidal crystals of Rose Manganese that accompany the Tellurium, Sulphuret of Manganese, Blende, Pyrites, &c. among Quartz: found at Nagyag, in Transylvania, (see tab. 91.) This variety, however, often contains much Carbonate of Lime even in the crystals; and in the amorphous part is so intimately mixed with Quartz, that it appears to form with it an homogeneous mass. The specimens from Kapnik appear to be very pure, and to contain no lime; thus proving the existence of the species. The larger specimen figured is from Nagyag: among the rose-coloured crystals of Carbonate of Manganese, are a few white rhombs of Brownspar, and some crystals of Quartz: the mass is probably a mixture of all three: Quartz is in various parts distinguishable in it in concentric coats. The black spots are Sulphuret of Manganese.

The lower specimen is also from Nagyag. The Carbonate of Manganese is in very much curved rhombs, and

appears to be less pure than in the upper specimen, forming an intermediate variety between it and Brown-spar, (Carbonate of Iron.) I have received lately from Scotland, Carbonate of Iron, of a pale pink colour, crystallized in rhombs, that approaches to the Manganese; it forms another connecting variety, and serves to prove that the species is not well circumscribed.

The following is the analysis of the pure variety, from Kapnik, by Lampadius :

Oxide of Manganese . . . . .	48
Carbonic Acid . . . . .	49
Oxide of Iron . . . . .	2.1
Silex . . . . .	0.9
	<hr/>
	100.0

The impure amorphous kind, from Nagyag, has been found by Klaproth to contain,

Carbonate of Manganese . . . . .	34
Carbonate of Lime . . . . .	13
Quartz . . . . .	53
	<hr/>
	100

There is probably another species of Manganese con-founded with this, and differing from the Manganesian Feldspar above alluded to, containing Protoxide of Manganese combined with Silex : it is found at Kapnik.



146.



## TAB. CXLVI.

FERRUM sulphatum, Argilliferum.

*Sulphate of Iron and Argilla.*

---

SULPHATE of Iron is the common produce of the decomposition of rocks containing Iron Pyrites, and probably often contains Sulphate of Argilla; in which case it seems sometimes to have been taken for native Alum, although it wants the Alkali. The specimen before us is from Bacherstolln, in Schmölniz: it contains a considerable quantity of Argilla, but apparently no Alum; which is, however, readily produced from it, by adding a little Potash. Its sourer taste distinguishes it from pure Sulphate of Iron: it is also less astringent, and less liable to be acted upon by the atmosphere.

The specimen was lent me by H. Heüland, Esq. whose uncommon liberality deserves my warmest thanks.





147.





TAB. CXLVII.  
 CALX Polyhalites.  
*Polyhalite.*

SYN. Polyhalite. *Stromeyer in Schweiggers Journal*, 21, 297 et seq. see *Thompson's Annals* 13, 112.

Fibrous Anhydrite. *Jameson, ed 2. vol. II. p. 249.*

Fasriger Muriacite. *Werner.*

A RECENT account of this mineral has been published in the following translation of part of a letter from Professor Stromeyer, as quoted above, by Dr. Thompson :

“ I shall conclude this letter by informing you of a new mineral, very remarkable, on account of its composition. I have given it the name Polyhalite. According to my analysis, 100 parts of it contain the following ingredients :

Hydrous Sulphate of Lime	- - -	28.74
Anhydrous Sulphate of Lime	- - -	22.36
Sulphate of Potash	- - - -	27.48
Anhydrous Sulphate of Magnesia	-	20.11
Common Salt	- - - - -	0.19
Oxide of Iron	- - - - -	0.32

---

99.20

“ This mineral occurs in the beds of rock salt at Ischel, in Upper Austria, and has been hitherto erroneously considered by mineralogists as *Muriacite* ; and under the name of *fibrous muriacite*, it has been described as a variety of that mineral substance.”

The characters by which it may be recognized are its partial solubility in water, a hardness superior to Fibrous Gypsum ; also a greater specific gravity, and a compact fibrous structure ; between the teeth it feels rather gritty : it is nearly tasteless. When fresh broken it has a shining, slightly pearly surface, which becomes dull and rather whiter by exposure. Its fibres penetrate both ways into the Muriate of Soda, which serves for its matrix ; they are of a dull red in the middle, and yellow brown at their extremities. The salt in which they are imbedded is white.





## TAB. CXLVIII.

MAGNESIA sulphata, var. Cobaltifera.

*Cobaltiferous Sulphate of Magnesia.*


---

SYN. Cobalt vitriolè. *De Born Catal. de Raab,*  
2, 43.

Magnésie sulfatée cobaltifère. *Haüy Traité,*  
2, 336. *Tabl. 16. Lucas Tabl. pt.*  
2, 67.

Red Vitriol. *Aikin 250.*

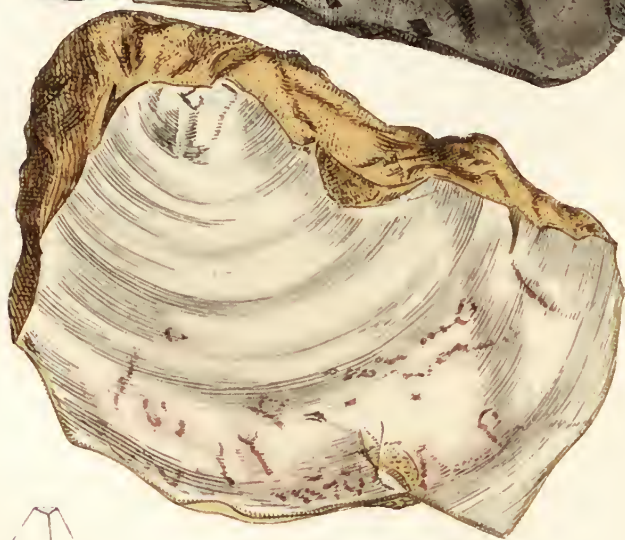
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SULPHATE of Magnesia has hitherto been found as a pulverulent crust upon the exposed surfaces of some rocks, or crystallized in brilliant spiculae upon stones containing Magnesia and Iron pyrites, by the decomposition of which it has been produced; in this latter form it has occurred upon schale, in the Hurllet mine near Paisley: the variety figured has been long known, and having once been called Sulphate of Cobalt, although in fact it contain but a small portion of metal, it has since been confounded with that salt, but the paleness of its colour and bitter taste readily distinguish it. It has been found only at Herrengrund in Hungary: De Born mentions a specimen of it, containing a drop of water. Haüy observes that it is found in Copper mines; and is accompanied by Quartz and Sulphate of Lime. Vauquelin determined its composition. It is probable that like most of the soluble salts that occur in mines, it is produced after the vein has been exposed to the action of the atmosphere.

From the British Museum.









TAB. CXLIX.  
CALX magnesiata.  
*Magnesian Lime.*

- 
- SYN. Magnesian Lime. *Brit. Min. Syst. Index.*  
*tab. 217. 402, 497.*
- Compound spar. Muricalcite. *Kirw. I. 92.*
- Chaux Carbanatée Magnésifère. *Haiiy II.*  
*187. Tabl. 5.*
- Dolomite. *Kirw. I. 111.*
- Chaux carbonatée aluminifère. *Haiiy II.*  
*173.*
- Rautenspath and Dolomit of *Werner.*
- Picrite. *Brong. I. 230.*
- Carbonate of Lime and Magnesia. *Aikin,*  
*164.*
- Bitterspar. *Nonnul.*
- 

**T**HE crystallized varieties of this mineral have been long known to contain Magnesia, and from the bitter taste of the salt, consequently produced by dissolving it in Sulphuric acid, it has obtained the name of Bitter spar. Since the presence of Magnesia gives a form of nucleus different from that of Carbonate of Lime, although very nearly allied to it, it has been admitted by modern mineralogists as a well defined species, and is found to be liable to many of the various forms that are assumed by other minerals, in different states of aggregation, and most of these forms have received peculiar names; thus it occurs crystallized in several modifications, the *Rautenspath* of *Werner*; lenticular, and of a greenish colour, *Miemite*; massive, with a granular structure, *Dolomite* and *Magnesian Limestone*, and compact, with a slight

transparency, when it is called *Gurhofite*, or *Gurhofian* or *Conite*, &c. some of these varieties being named from the places where they were first found, often before their component parts were known. The Dolomite, Magnesian Limestone, and Flexible Limestone of Sunderland, all varieties of this species, have been figured in *British Mineralogy*; the present plate exhibits the primitive crystal, a rhomb whose angles measure  $106^{\circ}15$  and  $73^{\circ}45$ , imbedded in green foliated Talc, or Chlorite; the acute rhomb, produced by a modification upon the lateral solid angles, receding upon the faces of the nucleus, towards the apex, and sometimes the apex is truncated: these crystals are imbedded in a granular mass of the same substance; it is from Halle in Saxony; and a variegated piece of a compact variety from Meissner in Hossia, called Conit, or Dichter Bitterkalk by the Germans, for which I am indebted to my valuable correspondent the Professor Stromeyer.

The constituent parts vary very much in different varieties, some containing little else than Carbonate of Lime, and Carbonate of Magnesia; others holding much Carbonate of Iron; the latter approach in the form and lustre, as well as composition, to pearly Brown-spar (Carbonate of Iron in curving rhombs) as the Carbonate of Magnesia is diminished in quantity the Iron is increased, and Manganese often introduced; thus rendering it difficult to determine which species many such intermediate specimens belong to; in general, however, those belonging to the Brown-spar (Carbonate of Iron) become black, when subjected to the action of the blow-pipe, and produce a dark green glass when fused with Borax: they are also less readily soluble in muriatic acid than even Magnesian Lime, which itself does not dissolve so quickly as Carbonate of Lime, as is manifested by the slower evolution of gas.





## TAB. CL.

SILEX fulgens. § 2. laminatus.

*Foliated Stilbite.*


---

SYN. Ichthyophthalmite. *Brit. Min. tab.* 520,  
*lower fig.*

Stilbite anamorphique. *Haiiy III.* 163,  
*tab.* 49.

Stilbite, in hexahedral prisms. *Aikin,* 209.

Foliated Zeolite. *Jameson, ed. 2, I,* 307.

Blätter Zeolith. *Werner.*

---

AFTER the plan adopted in the Systematical Index to British Mineralogy, of treating very distinct varieties, or doubtful species, as sections of the principal species they are allied to, it is found convenient to distinguish the mineral before us as a section of Stilbite, of which Haiiy, and after him many other mineralogists, guided by the measures of the crystals, although not quite satisfactorily ascertained, have considered it only a variety. Its superior lustre and hardness, together with the different symmetry of its crystals, lead to the suspicion of its being a distinct species, especially when we consider that it commonly accompanies the duller, columnar crystals of Stilbite, and that the same characters remain readily distinguishable even when the colour of both is a strong brick red, as in the figures in British Mineralogy, table 260 and 520. In the description that accompanies the latter figure, we were led by the lustre to believe that, both it and the mineral now under consideration, were varieties of Ichthyophthalmite, but this opinion is not supported by analysis, and some other con-

siderations incline us to withdraw it, particularly the direction of the striae upon the sides not being perpendicular to the pearly faces, as they are in that substance, (see Bouillon's Catalogue, p. 105.) The analysis of the Foliated Stilbite is as follows:—

	Meyer.	Vauquelin.
Silica - - -	58.3	52.6
Argilla - - -	17.5	17.5
Lime - - -	6.6	9.0
Water - - -	17.5	18.5
	<hr/>	<hr/>
	99.9	97.6

by which it appears that the Argilla and Lime are in very different proportions to those contained in the Ichthyophthalmite, which holds above 24 per cent. of Lime, and scarcely any Argilla.

The upper specimen is a mass of Calcedony, darkly coloured by Chlorite, with a mixture of Quartz and Zeolite encrusting it; upon it are deposited several distinct crystals of the foliated Stilbite. The other specimen is part of the side of a cavity in Wacke, lined with snow-white crystals of the same Zeolite, mixed with a few crystals of prismatic Stilbite, distinguished, as is commonly the case, by a yellow tinge and less brilliancy: it is from Ferroë.







## TAB. CLI.

PLUMBUM sulphureum, var. prismaticum.

*Prismatic Sulphuret of Lead or Galæna.*

---

SYN. Blue Lead Ore. *Kirwan*, 2, 220. *Aikin*, 109.

Plomb noire. *Haiiy Traité*, 3, 497.

Plomb sulfuré épigène. *Haiiy Tabl.* 83.

Blau Bleierz. *Werner*.

---

**T**HE mineral commonly known in England by the name Blue Lead Ore, appears to have been considered by Haiiy to derive its form from that of Phosphate of Lead by a substitution of Sulphur for Phosphoric acid and Oxygen, if such a process may be understood by the passage of the one ore into the other: the idea of its being a mixture of Phosphate and Sulphuret of Lead may be correct, but does not explain the nature of its formation. Some specimens are internally Phosphate of Lead, and in those which are wholly Sulphuret its granular texture and the uniformity of its substance shew clearly that it is not the immediate result of crystallization. It is found along with dark brown Phosphate of Lead, in large crystals, which agree with it in form, and of which I have added a figure at the top of the plate. It has often a brown surface, when it much resembles the unchanged Phosphate in external appearance, but is duller: at other times the surface is metallic, and is then generally variegated with a blue tarnish like tempered steel. Huelgöet in Britany, and Zschoppau in Saxony, are the only places where it has been procured.







## TAB. CLII.

## SELENIUM · Argento-Cupriferum.

*Ore of Selenium.*


---

See Thomson's *Annals*, Vol. II. p. 449.

---

**T**HE only mention we have in England of the ore that contains the extraordinary new metallic substance discovered early last year, by Professor Berzelius, in the sulphur procured in roasting the Pyrites of Fahlun, and which is used for the manufacture of sulphuric acid at G ipsholm, is contained in an extract of a letter, from the Professor to Dr. Marcet, which is inserted in Thompson's *Annals*, as quoted above; it is as follows: "With respect to Selenium, I must inform you that I have found a fossil which contains one-fourth of its weight of it. It had been for a long time considered as an ore of Tellurium. I made an analysis of it some time ago; I could not find any Tellurium in it, but the blow-pipe always afterwards retained the odour of this metal. During my researches on Selenium, I recollected this circumstance, and the friend who possessed the mineral, sent me a sufficient quantity for an exact analysis. I find it to be composed of one atom of Selenuret of Silver, and two of Selenuret of Copper." In this account we have no description of the mineral, but the specimen here figured was presented to the British Museum, as a Selenuret of Copper and Silver, by Berzelius himself, and is supposed to be the same ore above mentioned.

The principal mass is Carbonate of Lime, with the cleavage very regular, and the faces strongly marked with diagonal striæ. The metal appears in a state of very minute division, dispersed in elongated black clouds through it, without interrupting the flatness of

the faces and only perceptible as a distinct substance in two or three fissures or porous parts of the specimen, where it occurs in very minute grains of the lustre and colour of tin.

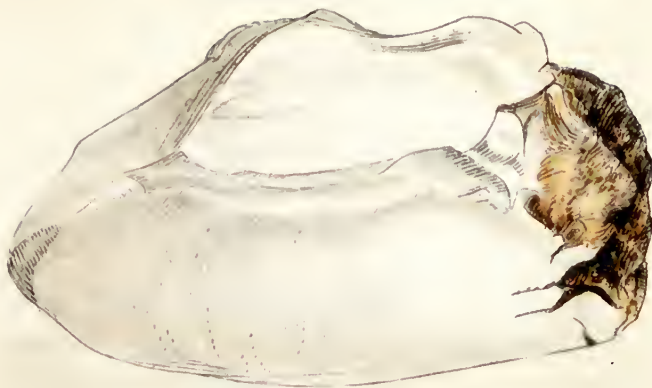
The following are a few of the peculiarities of the new metal as collected from Berzelius' letters in Thompson's Annals. It is of a grey colour, with a high metallic lustre, or if minutely divided of the colour of Cinnabar, it is a non-conductor of heat and electricity; it has a scarcely perceptible transparency. It is easily melted, and while cooling, may be drawn out into fine threads, that appear of a ruby colour by transmitted light while by reflected light they exhibit a brilliant metallic lustre. It is volatile at a temperature approaching that of boiling Quicksilver; when heated by a candle, it burns with an azure-blue flame, exhaling a strong odour of Horse-radish. It combines with Hydrogen, forming a similar compound to Sulphureted Hydrogen Gas, but so excessively pungent, that the Professor, having breathed a bubble of it no larger than a small pea, felt a painful sensation, was seized with a giddiness, that however soon left him and remained insensible to the scent of the strongest Ammonia, the inflammation and a catarrh that followed the inspiration, lasted a considerable time.

Selenium also combines with many of the other metals; with sulphur, alkalies, earths, wax, and fat oils, it forms red compounds, and is soluble in several acids. It also combines with oxygen, producing an acid that will form specific salts with alkalies, earths, and metallic oxides. Zinc precipitates Selenium of a red colour, but in its metallic form from muriatic acid.

It is highly probable that some other ore of this extraordinary substance will be found; at present its rarity renders the one figured, it being the only specimen in England, highly interesting.



153.





TAB. CLIII.  
 SILEX Lenzini.  
*Lenzinite.*

---

SYN. Alumine Hydratée Silicifère. *Léon Dufour*  
*in Journal de Phys. de Chim et d'Histoire*  
*Natur.* 86, 251.

Lenzinite. *John, ibid.* 86, 169.

---

THE mineral before us has obtained the name of Lenzinite, although it be not quite identical with that so named by John. There are two varieties of Lenzinite described by this celebrated chemist; one transparent, like semi-opal; the other opaque and unctuous to the touch: they are both found at Kall, in the Eisel. Lelièvre describes, in the *Annales des Mines*, vol. II, p. 473, a mamillated substance, which he compares to Hyalite, that was found by him many years ago, encrusting stones in a lead mine, on the mountain of l'Esquerre, on the left bank of the Oo, in the Pyrenees; when fresh collected it was wet and soft; but when dried it became brittle and hard enough to scratch Carbonate of Lime; its analysis, as will be seen below, shews it to be somewhat similar to Lenzinite: Lelièvre named it Alumine hydratée silicifère. Mr. F. J. B. Menard seeing that memoir, recollected a tallow-like mineral, found in quarries of indurated Calcareous Marle, (Tuffau of the people of the country) near Mans, in the department of the Sarthe; it occurred in nests and roundish pieces, about the size of nuts. He proposes to call it Wallerite, considering it different, although it contained the same ingredients as the mineral described by Lelièvre, and which he would call Lievrite, if that

name were not adopted for another mineral (Silex Lievri, tab. 79.) Lastly, Mr. Léon Dufour found, in an alluvial deposit, the mineral now figured, at St. Sever, in the department of the Landes, about the beginning of 1818; it is in masses that are sometimes as large as one's head: its texture is very fine and even, and soft enough to yield to the nail, which gives it a polish; when fresh broken it smells strongly of apples: in general it is opaque, but some parts are semi-transparent. It hardens when heated, but is not fusible; in water it falls to pieces with a crackling noise. The following analyses shew the relationship of the substances above-mentioned; it is very probable that they are all casual productions, either deposited by water, containing the particles of decomposed Feldspar, or some other mineral suspended in it, or, perhaps, even the immediate result of the decomposition of some stone that once occupied their places in the rocks where they occur. Cimolite and Collyrite also appear to be analogous, and lead towards common Pipe Clay.

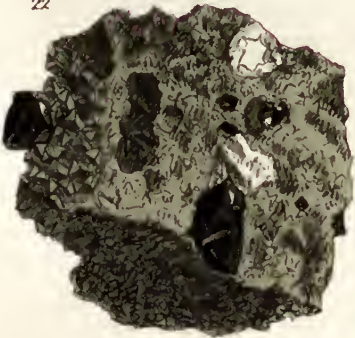
	Lenzinite.		Alumine hydratée silicifère.		
	opaline. By John.	argilleuse.	From St. Sever. lb. by Pelletier.	From L'Esquerre. by Berthier.	From nr. Mans. by Vanquelin.
Silex	37.5	39	50	15.0	47
Argilla	37.5	35.5	22	44.5	21
Water	25	25.0	26	40.5	30
Lime	a trace	0.5	0	0.	0
Iron	0.	a trace	0	0.	2 to 3
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	100.0	100.0	98	100.0	100.
	Collyrite by Klaproth.		Cimolite also by Klaproth.		
Argilla		45	.	.	23
Silex		14	.	.	63
Water		42	.	.	12
		<hr/>		Iron	1.25
		101		<hr/>	<hr/>
					99.25

I have been favoured with the Siliciferous subsulphate of Alumine by Dr. W. Henry, which he has described in Thompson's Annals, v. II. p. 432: when fresh it resembles hogs' lard, but must be considered as distinct from Lelièvre's mineral above mentioned: it is a casual production from the decomposition of the Shale in a coal mine near Oldham.

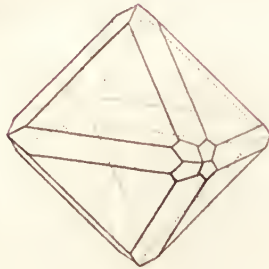




22



25



TAB. CLIV.  
 ARGILLA Spinellus.  
*Spinel.*

---

- SYN. Argilla Spinellus. *Ex. M. tab. 7.* Argilla  
 zincifera. *Ex. M. t. 11.*  
 Rubinus Spinellus et Balassus. *Wallerius,*  
 1, 247.  
 Spinell & Balass Rubies. *Kirw. 1, 253.*  
 Spinelle. *Haiiy II. 496. Tabl. 31. Bour-*  
*non Catal. 33.*  
 Celanit. *La Metherie Journal de Phys.*  
 1793, p. 23.  
 Pléonaste. *Haiiy III. 17. Tabl. 31.*  
 Spinell, & Zeylonit, *of Werner.*
- 

**T**wo distinct varieties of Spinel have already appeared in this work: the pale blue from Aker, and the Zinciferous, or Automalite, from Fahlun in Sweden. It remains only to figure the more perfect form of the species, and the variety called Ceylonite. Spinel rubies have only been found on the island of Ceylon; they vary much in tint, but when the colours are bright, they have an orange hue, that distinguishes them from the oriental rubies, which if high coloured have a peculiar blueish glow, and sometimes incline to purple without losing their brilliancy. On the other hand, the orange varieties of the Spinel are rather purer than those of the oriental ruby. The green, dull blue, and greenish-black varieties of Spinel, had for some time been thought to be a distinct species, but this opinion is now given up, in conformity with the suggestions of Haiiy, confirmed by the observations of Bournon. Fig. 17 shows a Spinel of the

form that once characterised the Ceylonite (see fig. 23;) and figs. 19 and 20 are from two black crystals of Ceylonite in the British Museum. Fig. 22 shows the same variety imbedded in Augite, with Meionite, from Vesuvius. The other remarkable crystals upon this plate are, the rhomb, fig. 7; the mackled octohedron with two of the entering angles filled up, fig. 11; the approach to a tetrahedral prism, fig. 14, and to an hexahedral prism, fig. 15, by the truncation of some of the edges of the octohedron: the latter is also mackled; and a lilae octohedron from limestone, ejected by Vesuvius, and which contained myriads of such crystals, fig. 21; I am indebted to the Countess of Aylesford for a specimen of this.

Figs. 2, 6, and 13 are from the collection in the British Museum; they are remarkable for size as well as form; the first presents an opaque surface, not uncommonly met with: it has an aspect resembling that of flint, which has been exposed to the sun and weather.

The following are the analyses of this mineral hitherto published.

	Spinel by Klaproth.		By Vauquelin.
Argilla . . .	74.50	.	82.47
Silex . . .	15.50	.	
Magnesia . .	8.25	.	8.78
Oxide of Iron	1.50	Chromic acid	6.18
Lime . . . .	0.75	Loss	2.57
	<hr/>		<hr/>
	100.50		100.00

Ceylonite by Collet Descotils.	
Argilla . . . . .	68
Magnesia . . . . .	12
Silex . . . . .	2
Oxide of Iron . . . . .	16
Loss . . . . .	2
	<hr/>
	100.







## TAB. CLV.

## SILEX Hyalithus.

*Hyalite.*

SYN. Hyalite. *Kirw.* 1, 296.

Quartz concrétionné (in part). *Haiüy II.*  
416. *Tabl.* 25.

Muller's-glass and Lava glass, of many.

Hyalith of *Werner.*

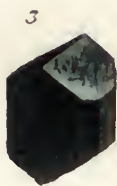
**T**HIS mineral has been long known, and yet many mineralogists are still wavering in their opinions respecting it; some considering it a variety of Quartz, or Calcédony; others joining it with Fiorite, Zeolite, &c. but all with some hesitation: in its composition it approaches to Opal, but differs in lustre, form, and texture, so that at present seems best to insulate it. Its resemblance to gum spread in masses, the surfaces of the cavities of the Basalt in which it occurs, is so exact, in consequence of its great lustre, and the fine cracks that traverse it, that it is only necessary in its description to add that its hardness is nearly equal to that of Quartz, and its form between botryoidal and mamillated. The upper figure represents a specimen from Frankfurt on the Mayn; the other one from Bohunitz, in Hungary; they are both in the collection at the British Museum.

Bucholz gives us the following analysis:

Silex . . . . .	92.
Water . . . . .	6.33
A trace of Argilla .	
Loss . . . . .	1.67
	<hr/>
	100.00







## TAB. CLVI. and CLVII.

## SILEX Pyroxenes.

*Pyroxene or Augite.*

- 
- SYN. Schorl des Volcans. *Danbenton Tabl. 11.*  
 Volcanite. *Lam. 2, 327.*  
 L'Augite. *Broch 1, 179.*  
 Pyroxène. *Haiiy 3. 80. Tabl. 41. Bour-*  
*non Catal. 70.*  
 Augit and Kokkolith, of *Werner*. Also Fas-  
 saïte. *See Haiiy in Annales des Mines,*  
*2, 164.*  
 Coccolith. *D'Andrada, Scherer's Journ.*  
*b. 4, 19, s. 30. Haiiy 4, 355.*  
 Yenite. *Ex. Min. tab. 29.*
- 

AUGITE is very variable in its appearance, arising partly from the different forms of its crystals, and partly from its various colours; and hence it has been divided into several species, and new varieties have had names given to them as soon as found.

The most common kind is of a deep black colour, with a conchoidal fracture; it abounds in perfect crystals, dispersed through Basalt, Lava, and Trap rocks, wherever those rocks occur (see figs. 3, 4, and 5, tab. 156); but though it has been long found in Scotland and Ireland, I have not met with specimens sufficiently illustrative to figure in British Mineralogy. These crystals are often mackled, either by reversing one against the side of another, as in fig. 5 of tab. 156, or by two or more crossing each other obliquely. A rarer and more mag-

nificent variety is of a greenish black colour ; it occurs in groups of crystals attached by their bases to the mixture of Hornblende and Augite, in which they are situated, and which forms part of the primitive Greenstone, or Hornblende rock, of Arendahl, in Norway (see figs. 1 and 2, tab. 256. A brighter green variety, which approaches much in colour to Epidote, is found handsomely crystallized upon granular Augite (Coccolite) at Traversella, in Piedmont. These crystals are much modified ; the primitive planes of the prism being almost lost ; the larger planes upon most of the crystals being secondary ; many of the crystals are mackled, the mackling plane being in the diagonal of the prism ; in some of the specimens white Carbonate of Lime relieves the green Augite very beautifully (see fig. 1, tab. 157.) Augite of a dull green colour also abounds along with Epidote, Hornblende, Melionite, &c. in the masses of primitive Limestone, thrown out with the Lava by Vesuvius. (See tab. 154, f. 22.)

Another dull green variety of Augite has lately been brought to England from Fassa, in the Tyrol, with the names Pyrgon and Fassait, (see fig. 2 of t. 157) ; it is of a yellower colour than that from Traversella, but its crystals have the same general form as the smaller ones from that place ; the very acute pyramids of these crystals serve to disguise them, but the black ones found in Basalt have sometimes facets much inclined towards the prisms that would, if enlarged, form similar pyramids (see fig. 4. tab. 157. The nearly colourless variety, formerly called Diopside by Haüy, including Mussite and Alalite, is the most distinct of all ; but Haüy is satisfied of its identity : the Alalite is represented at fig. 3 of tab. 157 ; it is accompanied by orange-coloured Garnets of great beauty, and green Tale (Chlorite.) The Mussite is of a greener colour, less regularly crystallized, and



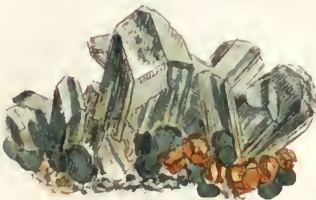
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2



3



4





often somewhat radiated in the mass. They are both found in the alp called la Mussa, near Ala, in Piedmont. A scopiform variety that was confounded with Lievrite, of which it was only the matrix, has been figured upon tab. 29 of this work; it has been considered by some as a variety of Epidote; but it is now determined that it is Augite.

The primitive form of Augite is an oblique prism, with a slightly rhomboidal base, whose angles measure  $92^{\circ}18'$  and  $87^{\circ}42'$ ; the base is inclined upon the oblique edge at  $106^{\circ}6'$ , consequently the crystals found in Basalt may be known from Basaltic Hornblende, which they resemble by the near approach of the primitive planes of the prisms to a right angle; (they are the narrower faces upon the crystals figured). Augite is difficultly fusible; its specific gravity varies from 3.226 to 3.310, Häuy: its hardness rather exceeds that of glass.

	Analyses of Augite from Etna.	From Fascati.	From Norway.
Silex . . . . .	52.00	48.	52.
Lime . . . . .	13.20	24.	25.5
Magnesia . . . . .	10.00	8.75	7.0
Argilla . . . . .	3.33	5.00	3.5
Oxide of Iron . . . . .	14.66	12.00	10.5
Oxide of Manganese . . . . .	2.00	1.00	2.25
Loss . . . . .	4.81	Potash a trace	Water 0.5

Vauquelin 100.00 Klaproth 98.75 Simon 101.25

Mussite analyzed by Laugier afforded

Silex . . . . .	57
Magnesia . . . . .	18.25
Lime . . . . .	16.50
Oxides of Iron and Manganese	6.00
	<hr/>
	97.75







## TAB. CLVIII.

## ARGENTUM nativum

*Native Silver.*


---

SYN. Argentum nativum. *Brit. Min. tab. 327 and 16.*

Argent natif. *Hall's Tabl. 73.*

Argent métallique natif. *Bournon Catal. 202.*

---

THE native Silver figured in British Mineralogy is so ill defined that it seemed necessary to give another figure to shew how distinct it sometimes occurs; the specimens selected, and of which only parts are exhibited, are from Kongsberg, in Norway: a place celebrated formerly for the quantity of silver, and magnificence of the specimens produced by its mines, which were superior to those of Mexico or Peru, single masses of pure silver having been extracted from them, weighing more than 500lbs. weight. Better defined crystals of such a size are, perhaps, not to be met with; they are imbedded in transition Limestone.

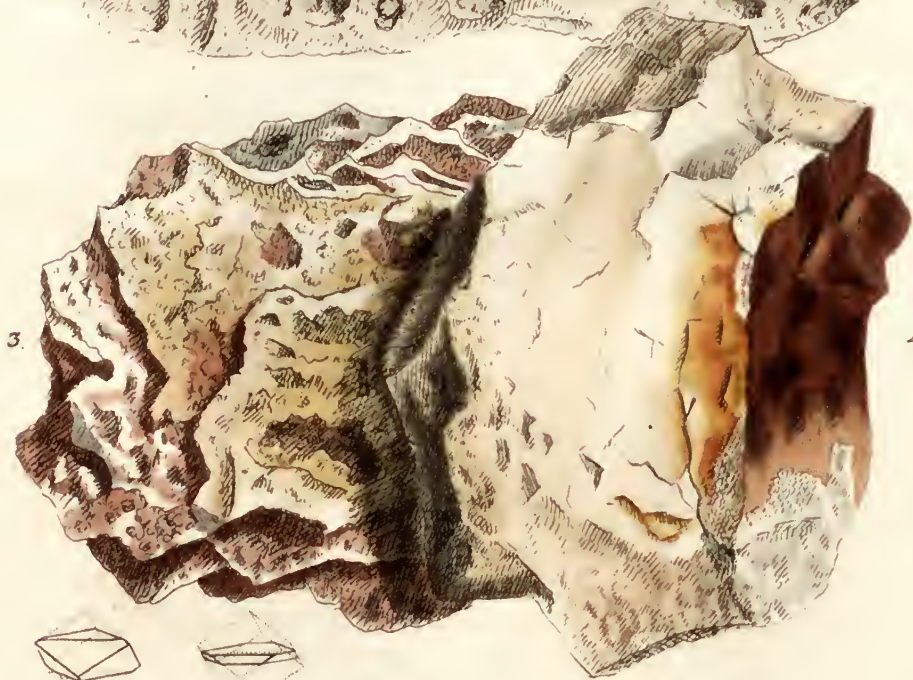
I am indebted to Mr. Heuland for the use of them.

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## TAB. CLIX.

## ARGILLA silico-sulphata.

*Alum Stone.*


---

SYN. Alaunstein, *of the Germans.*  
 Alumenilite. *La Meth.* II, 113.  
 Siliciferous subsulphate of Argill. *Sowerby's*  
*List of Minerals*, 3.

---

THIS mineral has long been known by the German writers on mineralogy, nevertheless it has been neglected by many French authors, and appears to have been almost entirely unknown in England until some specimens were imported from Vienna in 1819. The crystallized form is a late discovery; the varieties from Tolf near Civita Vecchia are destitute of any approach to crystallization, they are massive with a smooth and splintery or rough and rugged fracture, and want that glimmering which the surfaces of minute crystals dispersed through the masses give to the varieties from Hungary; these masses are also cellular, and the cells whose form is very irregular and ragged are lined with glistening crystals, most commonly of such small dimensions, and so closely set, that their forms cannot be distinguished; in some specimens however the crystals are larger (perhaps the 20th. of an inch wide) and arranged in little globules, and some are sufficiently insulated to shew that they are six-sided plates with alternately inclined edges, their surfaces are very brilliant and flat. The rarest form of this mineral is in well formed rhombs whose edges are the 10th of an inch long, grouped closely upon the surfaces of hollows in the same substance.

The sides of the rhombs are generally slightly curved like those of Brown spar, and their apices truncated, leading to the minute plates above mentioned (see the

outlines); the plain produced by the truncation is very flat and brilliant, the others are shining; the fracture is uneven and rather dull in every direction except that perpendicular to the axis of the rhomb, in which it is foliated and brilliant. The crystals are soft enough to yield to the knife easily with a grating sound, but the cellular mass contains a greyish substance that is so hard as to injure the edge of the knife and probably contains more siliceous matter than the crystals imbedded in it, which ought to be considered as pure Alum-stone. The crystals, are transparent on the edges, the other parts opaque.

The spec. grav. varies from 2,587, to 2,633; it is difficultly fusible.

The following are the analyses given by Vauquelin and Klaproth.

	Vauquelin	Klaproth from Tolfa.	Ditto from Hungary
Argilla . . . .	43.92	19.0	17.5
Silex . . . .	24.00	56.5	62.25
Sulphuric acid .	25.00	16.5	12.50
Potash . . . .	3.08	4.0	1.0
Water . . . .	4.00	3.0	5.0
	<hr/>	<hr/>	<hr/>
	100.00	99.0	98.25
	<hr/>	<hr/>	<hr/>

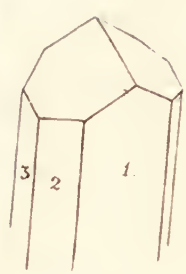
It is evident that this mineral contains all the constituent parts of Alum which has long been extracted from it, by first roasting so as to destroy the adhesion of the particles, then washing from the Siliceous and superabundant Argill the soluble portions and evaporating the water to obtain the alum in crystals.

Fig. 1, represents the largest crystals I have met with; they are from Bereghsaz.

Figs 2 and 3 are from the cellular variety found also at Bereghsaz in Upper Hungary.

Fig. 4, the most compact variety from Tolfa, it is accompanied by Quartz.





## TAB. CLX.

## SILEX Salaensis.

*Sahlite.*

- SYN. Sahlit. *D' Andrada, Werner, &c.*  
 Malacolithe. *D' Abildgaard, Haiiy IV. 379.*  
 Pyroxène (in part) *Haiiy Tabl. 41 and 42.*  
 Augite  $\beta$ . *Sahlite, Aikin 228.*  
 Sahlite. *Bournon Catal. 76*  
 Silex Salaensis, *Sowerby's List of Minerals, 8.*

AUGITE occurs under so many different appearances that it is difficult to fix upon a character by which to distinguish Sahlite from it; if it really prove to be, as Bournon and the followers of Werner assert, a distinct species; the colour suit insisted upon by the latter is of little service, since Augite is sometimes almost white; yet there is in the green varieties of Sahlite a blue cast and a kind of glaucous appearance that is not in the green Augites (see tab. 157) the different position of the nucleus, an oblique prism, in the crystal observed by Bournon would be a good character if that nucleus were not easily divisible in the diagonals of its base, producing faces corresponding with those of the nucleus of Augite, in their relative position with the termination of the prism, which in Augite is found to incline upon the angle of the prism while in Sahlite it inclines upon one of the lateral faces. The only character left by which Sahlite may be known with certainty, is the facility with which it breaks in the direction of all the sides of the nucleus and of its diagonals, but more particularly in that of the terminal faces, parallel to which numerous fissures are conspicuous in all the varieties; most of the surfaces thus produced are shining but seldom flat for any great extent; but those parallel to the terminal planes are dullest and generally flat quite across the crystal, with a peculiar lustre, and somewhat scaly surface. Augite

never presents a flat fracture in this direction, but often exhibits a conchoidal cross fracture which is seldom seen in Sahlite because the other fractures are more easily made. The differences in goniometrical measures are too small and perhaps not sufficiently established to be relied upon, and if they were, it is seldom that specimens occur upon which they can be observed. The nucleus according to Bournon is a rectangular 4-sided prism with its terminal planes inclined upon two of the sides at an angle of  $106^{\circ} 15'$

The analysis of Sahlite shews it to contain more Lime and Magnesia than is found in Augite, but the latter is so variable in its composition that little reliance can be placed on this circumstance.

Sahlite according to Vauquelin contains,

Silex . . . . .	53
Magnesia . . . . .	19
Argilla . . . . .	3
Lime . . . . .	20
Iron and Manganese . . . . .	4

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99

Sahlite is named from Sahla in Sweden, where it is found in the silver mines; it is also abundant near Arendahl in Norway, where it is associated with Magnetic Iron, Mica, Hornblende, Carbonate of Lime, &c. It also occurs in a granular form mixed with granular Magnetic Iron and Mica at Sverdjo near Falun: this variety has often been called Coecolite (granular Augite) but differs from it in its foliated structure. In Scotland it also is found but mostly in masses composed of various sized crystals closely matted together and nearly white.

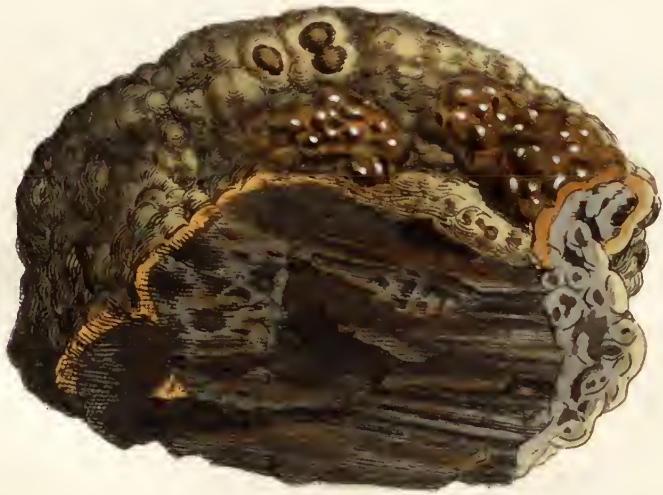
Fig. 1 represents a Scotch specimen from Glen Elg.

Fig. 2, a crystallized specimen from Arendahl, taken from the collection in the British Museum.

Fig. 3 the granular variety from Sverdjo.

Nos. 1 and 3 and the larger terminal plane in the outline are the primitive faces; No. 2 and the other narrow faces of the prism with the same terminal face are what would be the primitive faces if the crystal belonged to Augite instead of Sahlite.







## TAB. CLXI.

PLUMBUM Argilliferum.  
*Aluminate of Lead.*

- SYN. Plomb-gomme (of the French.) *Berzelius Nouveau Système de Minéralogie, ed. 1819, 283.*
- Aluminate of Lead. *Thompson's Annals of Phil. XIII, 381.*
- Native Hydrous Aluminate of Lead, *James Smithson, Esq. in Annals of Phil. XIV. 31.*
- Hydrate d' Alumine et de Plomb, *M. de Laumont, in ib.*
- Sel acide-phosphorique martial &c. *Extrait d'un Mémoire sur la description de plusieurs filons métallique de Bretagne, par M. de Laumont. Journal de Phys. XXVIII. 385, F 16:*

**P**LOMB-GOMME, as this mineral has lately been called, in consequence of its resemblance to Gum as it issues from the tree, does not appear to have been described by any author, although it was mentioned as a peculiar mineral so long ago as in 1786 in the *Journal de Physique* by M. de Laumont, and even a few years previously by De Lisle: if his "Plomb rouge en stalactites" which he describes of a lively red, not orange or yellow colour, be the same substance. (Vol. III p. 399.) It has been found only in one place in the mine of Huelgoat, near Poullaouen, in Britany.

It occurs in a mamillated form encrusting the surfaces of hollows among stalactitical prismatic Pyrites, (decom-

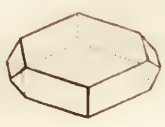
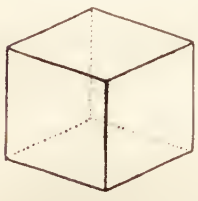
posing Iron Pyrites.) It is of a bright wine yellow colour perfectly transparent, and possesses a high degree of lustre. Its structure is like that of Malachite, and consists of numerous concentric layers formed of perpendicular fibres, the surface of the outermost layer is dull, but that of every internal one is highly polished and very brilliant; the hardness is superior to that of Fluor, but it yields easily to the knife; its specific gravity taken from a small piece which had several fissures in it was above 3.365. Under the action of the blowpipe it decrepitates violently; if exposed gradually to heat it becomes opaque, white, and contracts slowly in bulk, but does not melt at any temperature, nor is it altered by charcoal; it effervesces rapidly when boiled in dilute Sulphuric acid, which dissolves the Argilla, and leaves Sulphate of Lead reducible upon charcoal; when heated below redness its water is given out silently. It was ascertained by the much to be regretted and unfortunate Smithson Tennant, Esq. when last in Paris, to be a compound of Oxide of Lead, Argilla and Water; since then Berzelius has made an accurate analysis of it, which is as follows.—

Oxide of Lead . . . . .	40·14
Argilla . . . . .	37·00
Water . . . . .	18·80
Sulphurous acid . . . . .	0·20
Lime, oxides of Manganese and Iron	1·80
Silex . . . . .	0·60
	<hr/>
	98·54

Berzelius supposes the Sulphurous acid to be combined with parts of the Lead and Argilla forming Sulphites and with the Silex, Lime, &c. as accidentally mixed.

The acid stiptic taste mentioned by M. de Laumont probably arose from an admixture of Sulphate of Iron produced by the decomposition of its matrix.





## TAB. CLXII.

ARGENTUM (sulphureum) flexile.

*Flexible Sulphuret of Silver.*


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SYN. Argent Sulfuré flexible. *Bournon Catal.* 209  
Argentum flexile. *Sowerby's List*, 16.

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THE only account we have of this mineral is given by its discoverer, the Count de Bournon; it is extremely rare, the only specimen in England is the one figured; it was found in Mr. Partsch's cabinet of Minerals at Vienna, among the ores of Tellurium, and was brought to England with it by my son G. B. Sowerby.

The following observations are extracted from Bournon's Catalogue :

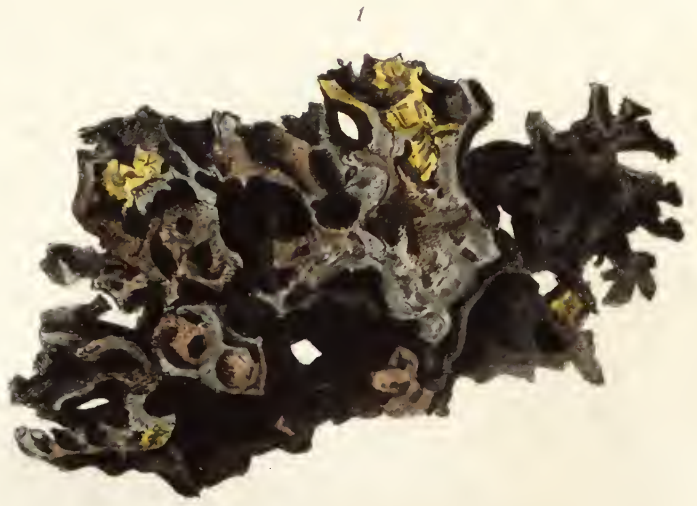
“ I am unable to bring this substance under any of the known ores of Silver, from all of which it differs wholly in its specific characters. Its colour approaches black; it is tender and easily cut by a sharp instrument; but the cut surface, without being dull, has not so brilliant a metallic lustre as that of the sulphuret of Silver. Its primitive form is a rhomboidal tetrahedral prism of 60° and 120° divisible parallel to the terminal faces with almost the same ease as Mica. When its crystals are thin, which they generally are, they are nearly as flexible as a plate of Lead of the same thickness: this property is alone sufficient to characterize in this sulphuret of Silver a new species, and from it I have named it Argent sulfuré flexible, until some other name be given to it: by this character I have been led for a long while to esteem this substance as probably a grey Tellurium from Naggiag, but the examination of it made at my request by

Dr. Wollaston has done away with this opinion, as he found only Silver, Sulphur, and slight traces of Iron in it. I have met with seven modifications of the primitive crystal."

"In general the crystals are very small, their gangue in the specimens (8 in number) which are placed in this (the Count's) collection is a ferriferous carbonate of Lime, of either a deep pearl grey or flesh colour, mixed with grey sulphuret of Copper and Iron, and carbonate of Lime in lenticular rhomboids. I believe they are from Hungary."

The gangue of my specimen is similar.







## TAB. CLXIII.

## FERRUM Niccoliferum.

*Nickoline, or Meteoric Iron.*

- 
- Syn. *Meteoreisen, Klaproth Beit. b. 4. s. 99.*  
*Fer natif Météorique, Haüy Tabl. 93.*  
*Lucas Tabl. partie 2, 358.*  
*Native Iron, α Meteoric. Aikin 95.*  
*Native Iron. Bournon and Howard Phil.*  
*Trans. for 1802.*
- 

**I**n British Mineralogy, tab. 101, I have given some account of the native Iron contained in Meteorolites; it was at a time when these Stones were so little understood, that the fact of their falling was doubted by most Philosophers; this is now generally admitted, and no apology is necessary for introducing the alloy of Iron and Nickel which has been found on various parts of the Earth's surface, as of Meteoric origin. The present examples being mostly free from earthy and stony materials must appear most astonishing, but they are nearly as well, although not so generally authenticated as the Stones, partly by the traditions concerning them, partly by their similarity in composition, and partly by the insulated situations they have been found in upon the surface of the ground. It appears that the ancients were acquainted with both kinds, but that the earthy masses have been much the most numerous, and venerated from the earliest periods; indeed, so much were the idolators struck with them that they considered them as marks of the anger of the Gods, or as Gods come to visit them, and upon the latter supposition built temples, in which

they protected and worshipped them: such, it is supposed, the image of Diana in the temple at Ephesus originally was. That which the pagans entitled the Mother of the Gods, said to fall at Pessinus, and was taken from Phrygia to Rome in the time of Scipio Nasica, and several similar images, were probably Meteoric Stones. The stone so much venerated by the Arabs, which is set in silver in the Caaba in Mecca, the Mehometans, who destroyed above 360 other images they found there, say was brought down from heaven by Gabriel, and that it was originally white, but has contracted the blackness that now appears on it from the sins of men; this may very probably be a Meteoric Stone with its natural black crust, and not blackened either by the sins or the kisses of pilgrims as sometimes related. In the time of Pliny, who has given accounts of the falling of several Stones at various periods, and of a spongy mass of Iron that fell in Lucania, about 56 years before the Christian era, it seems that his statements were acknowledged; in the progress of time, however, these facts, although they continued to occur, became mixed so much with fabulous accounts that they were treated with ridicule or forgotten, so that translators, who could not conceive the fall of a stone to be probable, have translated passages where they may have been alluded to, more after their own ideas, and it is but lately that this knowledge has been renewed to the learned of our times. Although the fall of masses of Iron is of rarer occurrence than that of Stones, it is not very remarkable that they should be still found upon the surface of the Earth in various places where the memory of man has not preserved even a tradition of their fall; for after the Iron is once well coated with rust it does not appear to be of a very perishable nature; whereas the Stones in consequence of their loose

texture, and the quantity of Pyrites contained in them, would soon decay ; hence they have not been found casually, but have entirely escaped notice, unless they have been traced from a meteor or seen to fall. Out of about fourteen accounts of the fall of Iron that have been preserved either by books or tradition, it does not appear that more than three can be verified by the remains of the masses they refer to,\* the Siberian, that of Agram, and that preserved at Elbogen ; while eight or ten similar masses of Iron have been found in places where they could not have come from any mine, and also containing Nickel, an ingredient that is common to all the Meteorites. On the other hand there are about 170 authentic accounts of the fall of stones either in showers of thousands, or singly, out of which only about 50 of different dates have been preserved by the curious to the present day†, and none have been found remaining on the earth's surface. It is a curious circumstance, and almost promises to agree with the words in my preface to the ' List of Rocks and Strata,' where I observe, that, "Meteorites appear to have increased in numbers within the last century or two, and it is not impossible that they may be so numerous in the course of ages as to cover a considerable portion of surface, if they have not already done so in some remote unvisited parts, for Nature generally operates upon a large scale, and is not limited by time" that in the north-east corner of Baffin's Bay there should

\* The Iron has probably been worked up, as it was in China and Cordova in Spain.

† Since I published the account in Brit. Min. of the Yorkshire and Glasgow Meteorolites, there have fallen, a single stone in the county Tipperary in August, 1810, and several stones near Adare in the county of Limerick on the 10th of September, 1813. The first of these I have figured along with the full sized one I have published of the Yorkshire Stone on a large folio plate.

exist several masses of Iron, one of which is so large that the natives consider it to be part of the mountain, and that this Iron should agree in lustre and containing Nickel with the Meteoric Iron.

There are two kinds of Iron supposed to be Meteoric: one of an uniform even texture, a whiter colour than pure Iron and very tenacious and ductile; the other of a foliated structure, darker colour, and somewhat brittle, although ductile; the first is difficult to break, but the broken surface resembles that of Lead, it feels smooth to the edge of a knife; the latter splits in breaking and the fracture has a granular surface, it grates under the knife; it is highly probable that it contains pyrites between the laminæ, and that they themselves are combined with a minute portion of Carbon.

I have selected examples of both kinds for figuring; of the first there appear to be but two known, viz. the famous ramified mass weighing 1600 pounds, found by Prof. Pallas upon a hill between Krasnojark and Abaakunsk near the Oubei and the Sisim in Siberia, and the solid mass mentioned by Barrow as having been found on a plain between the great Fish River and Graaf Reynet in southern Africa previously to his visiting that spot; both these I have figured. Of the foliated or crystallized kind, the most remarkable is that which fell in Croatia: the following account is given of it. At Hraschina, near Agram in Croatia, on the 26th of May, 1751, about 6 o'clock in the evening, a globe of fire appeared passing towards the east, it was accompanied by a sound like the rattling of chariots, and then exploded with a still more tremendous noise, giving out a black smoke, and dividing into two portions, the largest of which fell in a field and buried itself deep in the earth, which it shook like an earthquake, its weight was 71 pounds; the other fell in a meadow 2000 paces from the first, it

weighed only 16 pounds. I am indebted to the Imperial Cabinet of Vienna for a small fragment of the larger mass, which resembles in appearance Fig. 5, but it is composed of smaller parts. Another mass of the crystallized kind was preserved for many years at Elbogen in Bohemia; it is said to have fallen in 1647, its weight was 200 pounds; a piece of this I have also had from Vienna, it cannot be distinguished from the last.\* I have not figured either of these because the fragments were smaller, and because their characters are shewn upon a larger scale by that from Lenato. A fractured piece of the Elbogen mass has been presented to me by Prof. Stromeyer, which agrees in its form with the specimens exhibited at figs. 6 and 7; it was thought unnecessary, therefore, to figure it. Mr. Greville's piece of that from Elbogen is, however, given at figure 4.

Fig. 1 represents a specimen, from the late Mr. Greville's cabinet, of the Siberian Iron well calculated to shew its ramifying and cellular form, in the interior the cells are filled with a transparent yellow substance extremely like Olivine in all its characters and composition, it is supposed to be the same as the earthy part of the Meteoric Stones fused into a glass. Many of the cells are lined with Pyrites as is shewn at fig. 2. This is stated by the Tartars, who reverence it greatly, to have fallen from heaven.

Fig. 3. is from my specimen of the Iron found near the great Fish River; it was obtained at the Cape of Good Hope, and brought to England by Fiehtel. (The piece brought to England formerly by General Prehn I

\* The foliated structure of these Irons is rendered conspicuous upon the polished surface by washing it with acid, which acts more or less strongly upon it according to the hardness of the different parts. The Siberian and Cape Iron gain a fine velvety lustre by this operation, but shew a uniform surface.

understand was sent to Holland.) This is extremely pure and compact ; it is considerably harder, but otherways much of the texture of Lead ; it is not elastic when sawn into slices, but is easily rendered so by hammering ; a shaving taken from the surface by a chizel is elastic without any further operation ; it is so ductile and free from flaws that it may readily be rolled into sheets thinner than paper without cracking ; its hardness is such that it takes an excellent polish, its lustre is superior to that of pure Iron, and its colour nearer that of silver. These properties rendered it an excellent material for a sword blade, consequently, upon His Majesty the Emperor of Russia visiting England, I had a slice 2 inches and three-fourths long, 2 inches wide, and nearly three-fourths of an inch thick, hammered at a low red heat into a blade 2 feet long, and  $1\frac{1}{2}$  inch wide, which welded into a steel haft, and mounted, I presented to his Majesty\* as a memorial of his visit. Previously to this a slice had been sawn off by Smithson Tennant, Esq. at Sir Joseph Banks's request, and upon being analyzed was found to contain 10 per cent. of Nickel : some other experiments were made with it, but the results have unfortunately not been published. At one end of the mass is a fissure filled by sulphuret of Iron that is continually decomposing and absorbing moisture which spreads over the polished surface and rusts it, otherways it does not seem so liable to rust as common Iron or Steel. The mass originally found was carried from place to place as a great curiosity ; its weight was estimated by Barrow at about 300lbs. ; he further observes that it had "no matrix of any kind adhering to it, nor in the cavities of its surface were

\* See Phil. Magazine, Vol. 55, p. 49. His Imperial Majesty has expressed his approbation, by sending me a superb Emerald ring set with Diamonds, for which I feel highly grateful. It was brought by His Excellency Dr Crichton.

any pebbles or marks of crystallization." In sawing through it an empty spherical hollow about the size of a pea was met with.

Fig. 4. is from a piece, in the late Mr. Greville's collection, of that from Elbogen in Bohemia : it was presented to the Baron Born by the Academy of Freyberg. I have figured it in consequence of its containing a grey foliated, semivitreous, but opaque earthy substance among the Iron, which renders it intermediate between the Meteoric Stones and Meteoric Iron.

Fig. 5. is from a slice from Lenato in Hungary ; the edge has been polished and the surface treated with dilute nitric acid, which exposes the direction of the laminae of crystallization ; they are considered as parallel to the surfaces of regular octahedrons intersecting one another. The whole mass weighed 191lbs.

Fig. 6 is a fragment of the great mass found by Goldberry near the right bank of the Senegal in Africa ; it shews at once the foliated and granular structure.

Fig. 7. is a similar piece from St. Iago del Estro, in South America ; these are extremely like each other, but the American is rather the whitest, it could not be distinguished from a broken piece of the Elbogen Iron as I have observed before ; the mass this came from lies in the middle of a great plain 100 miles distant from any Rock or Mountain.

Figs. 8 and 9 represent two knives made of small flattened pieces of Iron, let into bones by the natives of the Arctic Highlands, discovered by Captain Ross. This Iron has been found to contain Nickel, which circumstance, together with the account of its being cut off with a hard stone from large masses that lie above ground upon a mountain, render it highly probable that it is of the same Meteoric origin as the above described kinds ; it was, however, stated that one mass was a part of the rock, but as it was harder than the rest it was possibly

something else. (See Ross's Voyage for the purpose of exploring Baffin's Bay, ed. 2, v. 1, p. 140.)

There are accounts of native Iron being met with not containing Nickel, but these are found in mines united to other minerals; the most authentic is that of Gross Kamsdorf in Saxony, it was accompanied by Brownspar, brown Iron-stone, and sulphate of Barytes: Klaproth found Lead and Copper in it.

The following are the analyses of a few of the meteoric Irons at present known:

	Iron.	Nickel.	
Siberian, sp. gr. 6487 . . . . .	87·5	12·5	Howard.
Bohemian, sp. gr. 6146 . . . . .	82·4	17·6	ib.
Agram . . . . .	96·5	3·5	Klaproth.
St. Iago, America . . . . .	90·	10·	Howard.
Mexico . . . . .	88·9	11·1	ib.
Senegal . . . . .	95·2	4·8	ib.
Arctic Highlands . . . . .	97·44	2·56	Mr Fyfe.

The vitreous part of the Siberian was found by Howard to contain:

Silex . . . . .	54
Magnesia . . . . .	27
Oxide of Iron . . . . .	17
Oxide of Nickel . . . . .	1
	89

the sp. grav. is from 3263 to 3300. Bournon.

Mr. Laugier has analyzed the Siberian Iron, uniting the earthy part with the Metallic, and obtained from 100 parts 113·1, the increase arising from the oxygenization of the metals.

Oxide of Iron . . . . .	68·2
Silex . . . . .	16·
Magnesia . . . . .	15·
Sulphur . . . . .	5·2
Nickel . . . . .	5·2
Chrome . . . . .	0·5
Loss . . . . .	3·
	113·1







## TAB. CLXIV.

## HELVINE.

SYN. Helvin, *Friesleben's Beiträge zur Min: Kenntniss von Sachsen*, b. 1, s. 126. *Cor-dier, Ann : des Mines for 1818. Heuland in Annals of Phil : XII. 453.*

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It does not appear that this mineral has yet been analyzed, we are therefore uncertain what genus to place it under. It has been found only in the mine called Brother's Lorenz, near Schwarzenberg in Saxony, where it is imbedded in dark green almost compact Chlorite, accompanied by lilac Fluor, Blende, Schaalstein and Quartz, its crystals are sometimes connected together, but are rarely attached to the gangue ; the most common form is an octohedron, four of whose faces are much smaller, of a deeper colour and more transparent than the others, sometimes these faces are very minute and even quite wanting, when the crystals become regular tetrahedrons with brownish yellow angles. Its lustre is about equal to that of Garnet, the fracture is uneven and rather splintery, by close attention indications of laminae parallel to the sides of the crystals are observable. The hardness varies in the same crystal, the opaque parts yielding to the knife while the transparent scratch crown glass. The specific gravity is from 3. 2. to 3. 3. ; before the

blow-pipe it fuses easily into a blackish brown glass. The yellow colour resembling that of the Sun when low in the horizon has given rise to its name.

I am indebted to Mr. Heuland for the use of the fine specimens figured.



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## TAB. CLXV.

## Manganesium oxygenatum pyramidale.

## Pyramidal Manganese.

SYN. Schwarzer Braunstein, *Werner*. Foliated Black Manganese-Ore, *Jameson*, *ed. 3, v. III, p. 263.*

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THE principal characters that distinguish this rare ore of Manganese, are its dark colour, close texture, and the acute pyramidal form of its crystals; generally the crystals are so closely aggregated together as to form a solid mass, in which they are only distinguished by their foliated structure, their external form is seen where they occur upon the surfaces of hollows. The mass has much the appearance of an opaque Iron Slag, but of a purpler black colour. The fracture of the compact parts is even with a dull surface, but the crystals having a foliated structure, give a ragged shining fracture. The powder is of the same colour as the mass. It is heavier than most other ores of Manganese. Although a foliated structure is very manifest yet it is difficult to obtain regular cleavages, but I think I have succeeded in procuring several inclined upon the faces of the acute octohedron, so as to give a more obtuse octohedron for the primitive; faces parallel to this exist around the truncated apices of several crystals upon the specimen figured. Jameson says, this mineral occurs in vein in secondary Porphyry, in the Manganese formation o.

Oehrenstok near Ilmenau in Thuringia, my specimen is said to be from Elgersburg near Gotha, and is accompanied by purple Fluor.

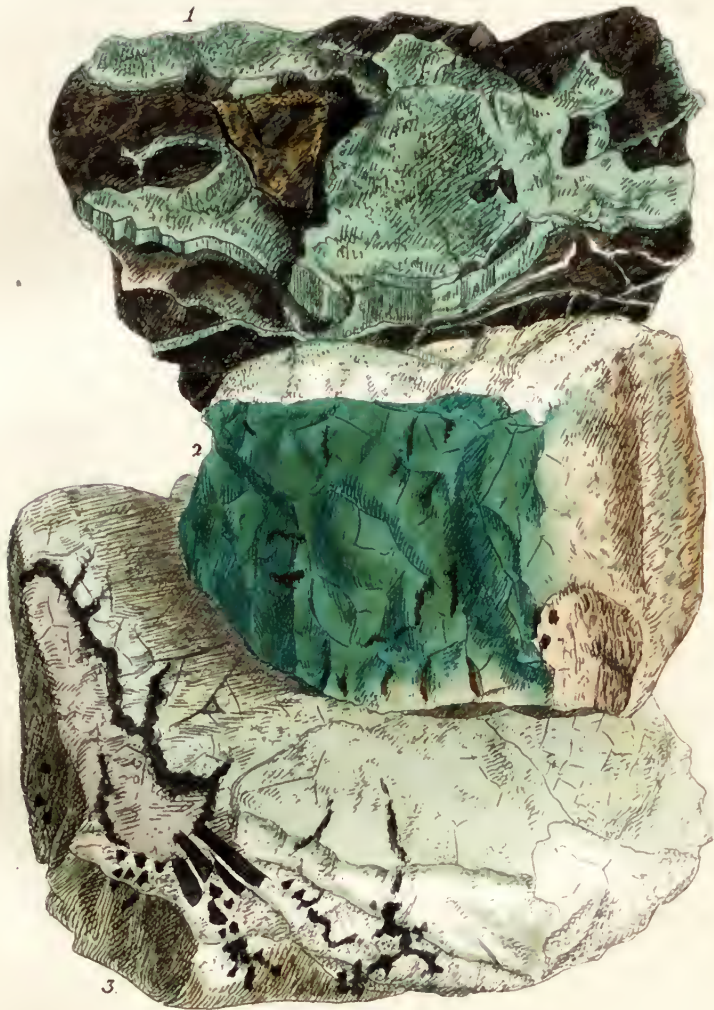
Berzelius speaks of an ore of Manganese crystallized in octohedrons, which he says comes from Piedmont, he gives the following analysis.

Silex	-	-	-	-	-	15.17
Brown oxide of Manganese					-	75.80
Alumina	-	-	-	-		2.80
Oxide of Iron	-	-	-	-	-	4.14
						<hr/>
						97.91

Whether this be the same kind of ore as the one before us, I cannot say his description is so short, it agrees however in not being altered before the blow-pipe except externally.







## TAB. CLXVI.

## Silex niccoliferus.

## Pimelite.

SYN. Pimelit, *Brochant and Werner*. Chryso-  
 pras Erde, *Klaproth*. Nickel, silicate?  
 Pimélite, *Berzelius nouveau Système de*  
*Min.* 202. Silex niccoliferus, *Sowerby's*  
*List of Min.* 8.

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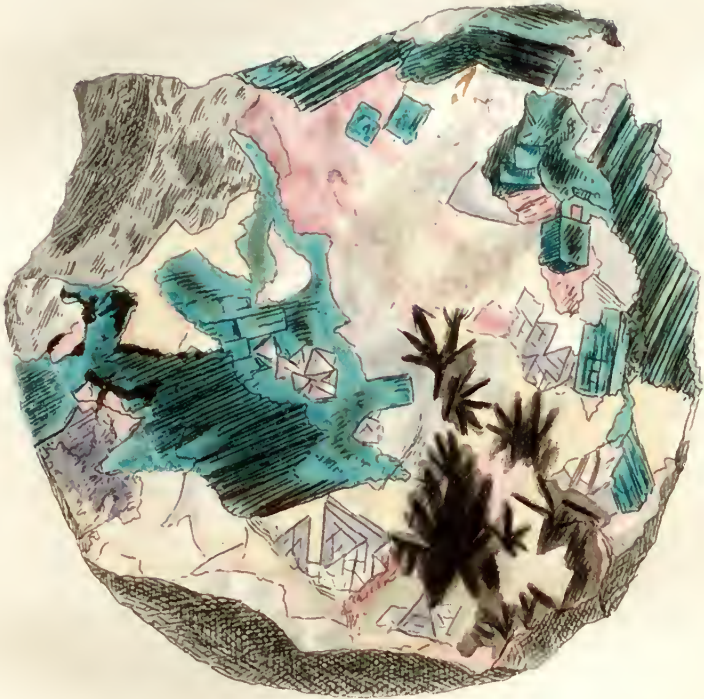
PIMELITE may be distinguished from other green minerals by its smooth greasy feel, its softness, it generally yeilds to the finger nail, and brilliant pure green colour. It occurs in the form of veins traversing Serpentine in Silesia, the finest varieties are found at Kosemütz, they are sometimes accompanied by a white earthy mineral of a less greasy feel, with a few minute glimmering scales dispersed through it, which has lately been considered as a distinct species and named *Razumoffskin*, after a Prince of that name, Mica and Tourmaline also accompany it.

The upper figure is taken from a specimen from Glasendorf, the Serpentine is partly decomposed. The middle figure is from Kosemütz, on one side is a considerable portion of yellowish Mica, and on the top a little *Razumoffskin*, which indeed seems to be the same substance as the Pimelite only free from colouring matter

and less compact, it is probably an hydrate of Silix. The lowest specimen consists almost wholly of Razu-moffskin penetrated by Tourmaline and encrusted by Pimelite of a very pale colour, the situation of which seems to support the above suggestion ; it is also from Kose-mütz Klaproth has given us an analysis of Pimelite, which shews it cannot be a variety of Steatite, as some have thought ; it is as follows,

Silix	-	-	-	-	35
Alumine	-	-	-	-	5,10
Lime	-	-	-	-	0,40
Magnesia	-	-	-	-	1,25
Water	-	-	-	-	37,91
Oxide	Nickel	-	-	-	15,62
					<hr/>
					95,28





## TAB. CLXVII.

## THULITE.

**W**E know but little of this rare mineral, but an idea may be obtained of it from the figure, sufficient for impressing the name upon the memory. The following characters may also be of service in recognizing it when met with. Its structure is compact foliated with laminae in two directions, parallel to the sides of an acute rhomboidal prism; the cross fracture is hackly and shining; it is hard enough to scratch glass strongly and is rather brittle; the most perfect parts are semitransparent and of a deep pink colour, other parts are paler by degrees until they are nearly white or yellowish white and opaque. Before the blowpipe the transparent parts soon become opaque and if the heat be suddenly raised, it intumescs much and produces a dull infusible spongy light brown slag.

The minerals that accompany Thulite are verdigrease, green Idocrase, Lilac Fluor, and Quartz. It is found in Souland, in Telemarken, Norway, and also in Greenland.

The specimen figured is in Mr. Heulands collection, it is from Norway.









## TAB. CLXVIII.

## CARPHOLITE.

SYN. Karpholit, *Werner*.

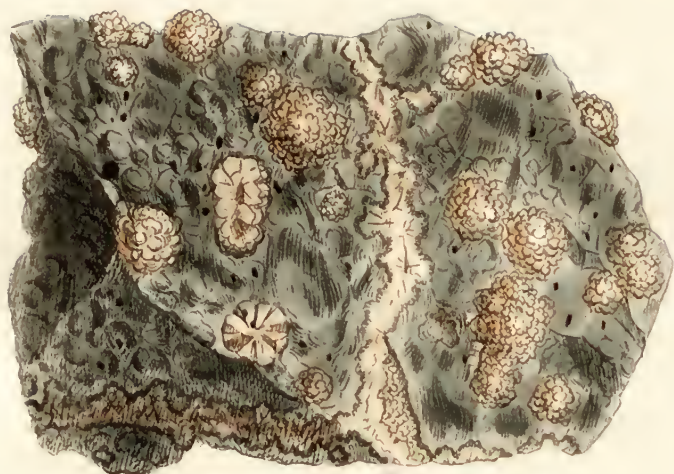
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**T**HE mineral before us is one of those new substances named by *Werner* a little before his lamented death, it appears to be perfectly distinct from every other; it consists of brilliant fragile acicular crystals arranged in stelliform groups, more or less compact, in the hollows and fissures of a rock composed of Quartz and Chlorite; it is accompanied by Fluor and phosphate of Lime. It is extremely brittle and softer than glass, before the blowpipe it swells and melts with ebullition into a dark brown globule. Its colour varies from nearly white to a deep straw yellow; its most common colour is pale straw, from which circumstance it has been named from *Καρφος*.

From *Mr. Heuland's* cabinet.







## TAB. CLXIX.

## SPHÆRULITE.

SYN. Sphærolit, *Breithaupt*. Sphærolite,  
*Jameson Ed. 3, v. 3, p. 545.*

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**T**HIS remarkable mineral occurs imbedded in Pearlstone\* and bears a great resemblance to some of those opaque concretions so common in green glass or slag that has been slowly cooled, and has probably a similar origin. It consists of balls and veins that seem to be a series of balls connected together, with mamillated surfaces; it breaks into angular fragments with flat dull surfaces diverging irregularly from the centres of the balls; the lustre is like that of coloured wax, the veins and some of the balls have a crust of a darker colour than their insides, and their fissures are often filled up with a white crust. The hardness is about equal to that of Quartz, but it is more brittle; it is nearly infusible.

It is more readily decomposed by exposure to the weather, than even the Pearlstone in which it is imbedded, forming a gritty powder.

The specimens figured, shew a considerable variation in the size of the balls, the lower one is in a decomposing state. They are from Siebenbirgen in Transylvania, it is said to be found in Iceland.

\* A variety of Pitchstone consisting of grey globules composed of concentric coats closely pressed together, it is most probably of Volcanic origin; it often, as in the present case, contains grains of Feldspar and black Mica dispersed through it.





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