

LIFE AND LETTERS  
OF   
THOMAS H. HUXLEY

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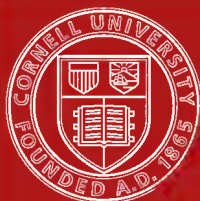
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LIFE AND LETTERS OF  
THOMAS HENRY HUXLEY











Portrait from a Daguerrotype made in 1846.

*Frontispiece.*

LIFE AND LETTERS  
OF  
THOMAS HENRY HUXLEY

BY HIS SON  
LEONARD HUXLEY

*IN TWO VOLUMES*

VOL. I



NEW YORK  
D. APPLETON AND COMPANY

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## PREFACE TO THE AMERICAN EDITION

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THE American edition of the *Life and Letters of Thomas Henry Huxley* calls for a few words by way of preface, for there existed a particular relationship between the English writer and his transatlantic readers.

From the time that his *Lay Sermons* was published his essays found in the United States an eager audience, who appreciated above all things his directness and honesty of purpose and the unflinching spirit in which he pursued the truth. Whether or not, as some affirm, the American public "discovered" Mr. Herbert Spencer, they responded at once to the influence of the younger evolutionary writer, whose wide and exact knowledge of nature was but a stepping-stone to his interest in human life and its problems. And when, a few years later, after more than one invitation, he came to lecture in the United States and made himself personally known to his many readers, it was this widespread response to his influence which made his welcome comparable, as was said at the time, to a royal progress.

His own interest in the present problems of the country and the possibilities of its future was always keen, not merely as touching the development of a vast political force—one of the dominant factors of the near future—but far more as touching the character of its approaching greatness. Huge territories and vast resources were of small interest to him in comparison with the use to which they should be put. None felt more vividly than he that the true greatness of a nation would depend upon the spirit of the principles it adopted, upon the character of the individuals who make up the nation and shape the channels in which the currents of its being will hereafter flow.

This was the note he struck in the appeal for intellectual sincerity and clearness which he made at the end of his New York *Lectures on Evolution*. The same note dominates that letter to his sister—a Southerner by adoption—which gives his reading of the real issue at stake in the great civil war. Slavery is bad for the slave, but far worse for the master, as sapping his character and making impossible that moral vigour of the individual on which is based the collective vigour of the nation.

The interest with which he followed the later development of social problems need not be dwelt on here, except to say that he watched their earlier maturity in America as an indication of the problems which would afterwards call for a solution in his own country. His share in treating them was limited to examining the principles of social philosophy on which some of the proposed remedies for social troubles were based, and this examination may be found in his *Collected Essays*. But the educational campaign which he carried on in England had its counterpart in America. It was not only that he was chosen to open the Johns Hopkins University as the type of a new form of education; there and elsewhere pupils of his carried out in America his methods of teaching biology, while others engaged in general education would write testifying to the influence of his ideas upon their own methods of teaching. But it must be remembered that nothing was further from his mind than the desire to found a school of thought. He only endeavoured as a scholar and a student to clear up his own thoughts and help others to clear theirs, whether in the intellectual or the moral world. This was the help he steadfastly hoped to give the people, that interacting union of intellectual freedom and moral discernment which may be furthered by good education and training, by precept and example, that basis of all social health and prosperity. And if, as he said, he would like to be remembered as one who had done his best to help the people, he meant assuredly not the people only of his native land, but the wider world to whom his words could be carried.

## PREFACE TO THE ENGLISH EDITION

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MY father's life was one of so many interests, and his work was at all times so diversified, that to follow each thread separately, as if he had been engaged on that alone for a time, would be to give a false impression of his activity and the peculiar character of his labours. All through his active career he was equally busy with research into nature, with studies in philosophy, with teaching and administrative work. The real measure of his energy can only be found when all these are considered together. Without this there can be no conception of the limitations imposed upon him in his chosen life's work. The mere amount of his research is greatly magnified by the smallness of the time allowed for it.

But great as was the impression left by these researches in purely scientific circles, it is not by them alone that he made his impression upon the mass of his contemporaries. They were chiefly moved by something over and above his wide knowledge in so many fields—by his passionate sincerity, his interest not only in pure knowledge, but in human life, by his belief that the interpretation of the book of nature was not to be kept apart from the ultimate problems of existence; by the love of truth, in short, both theoretical and practical, which gave the key to the character of the man himself.

Accordingly, I have not discussed with any fulness the value of his technical contributions to natural science; I have not drawn up a compendium of his philosophical views. One is a work for specialists; the other can be gathered from his published works. I have endeavoured rather to give the public a picture, so far as I can, of the man himself, of his aims in the many struggles in which

he was engaged, of his character and temperament, and the circumstances under which his various works were begun and completed.

So far as possible, I have made his letters, or extracts from them, tell the story of his life. If those of any given period are diverse in tone and character, it is simply because they reflect an equal diversity of occupations and interests. Few of the letters, however, are of any great length; many are little more than hurried notes; others, mainly of private interest, supply a sentence here and there to fill in the general outline.

Moreover, whenever circumstances permit, I have endeavoured to make my own part in the book entirely impersonal. My experience is that the constant iteration by the biographer of his relationship to the subject of his memoir, can become exasperating to the reader; so that at the risk of offending in the opposite direction, I have chosen the other course.

Lastly, I have to express my grateful thanks to all who have sent me letters or supplied information, and especially to Dr. J. H. Gladstone, Sir Mountstuart Grant Duff, Professor Howes, Professor Henry Sidgwick, and Sir Spencer Walpole, for their contributions to the book; but above all to Sir Joseph Hooker and Sir Michael Foster, whose invaluable help in reading proofs and making suggestions has been, as it were, a final labour of love for the memory of their old friend.



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## CHAPTER I

1825-1842

IN the year 1825 Ealing was as quiet a country village as could be found within a dozen miles of Hyde Park Corner. Here stood a large semi-public school, which had risen to the front rank in numbers and reputation under Dr. Nicholas, of Wadham College, Oxford, who in 1791 became the son-in-law and successor of the previous master.

The senior assistant-master in this school was George Huxley, a tall, dark, rather full-faced man, quick tempered, and distinguished, in his son's words, by "that glorious firmness which one's enemies called obstinacy." In the year 1810 he had married Rachel Withers; she bore five sons and three daughters, of whom one son and one daughter died in infancy; the seventh and youngest surviving child was Thomas Henry.

George Huxley, the master at Ealing, was the second son of Thomas Huxley and Margaret James, who were married at St. Michael's, Coventry, on September 8, 1773. This Thomas Huxley continued to live at Coventry until his death in January 1796, when he left behind him a large family and no very great wealth. The most notable item in the latter is the "capital Messuage, by me lately purchased of Mrs. Ann Thomas," which he directs to be sold to pay his debts—an inn, apparently, for the testator is described as a victualler. Family tradition tells that he came to Coventry from Lichfield, and if so, he and his sons after him exemplify the tendency to move south, which is to be observed in those of the same name who migrated from

their original home in Cheshire. This home is represented to-day by a farm in the Wirral, about eight miles from Chester, called Huxley Hall. From this centre Huxleys spread to the neighbouring villages, such as Overton and Eccleston, Clotton and Duddon, Tattenhall and Wettehall; others to Chester and Brindley near Nantwich. The southward movement carries some to the Welsh border, others into Shropshire. The Wettehall family established themselves in the fourth generation at Rushall, and held property in Handsworth and Walsall; the Brindley family sent a branch to Macclesfield, whose representative, Samuel, must have been on the town council when the Young Pretender rode through on his way to Derby, for he was mayor in 1746; while at the end of the sixteenth century, George, the disinherited heir of Brindley, became a merchant in London, and purchased Wyre Hall at Edmonton, where his descendants lived for four generations, his grandson being knighted by Charles II in 1663.

But my father had no particular interest in tracing his early ancestry. "My own genealogical inquiries," he said, "have taken me so far back that I confess the later stages do not interest me." Towards the end of his life, however, my mother persuaded him to see what could be found out about Huxley Hall and the origin of the name. This proved to be from the manor of Huxley or Hodesleia, whereof one Swanus de Hockenhull was enfeoffed by the abbot and convent of St. Werburgh in the time of Richard I. Of the grandsons of this Swanus, the eldest kept the manor and name of Hockenhull (which is still extant in the Midlands); the younger ones took their name from the other fief.

But the historian of Cheshire records the fact that owing to the respectability of the name, it was unlawfully assumed by divers "losels and lewd fellows of the baser sort," and my father, with a fine show of earnestness, used to declare that he was certain the legitimate owners of the name were far too sober and respectable to have produced such a reprobate as himself, and one of these "losels" must be his progenitor.

Thomas Henry Huxley was born at Ealing on May 4,

1825, "about eight o'clock in the morning." \* "I am not aware," he tells us playfully in his *Autobiography*, "that any portents preceded my arrival in this world, but, in my childhood, I remember hearing a traditional account of the manner in which I lost the chance of an endowment of great practical value. The windows of my mother's room were open, in consequence of the unusual warmth of the weather. For the same reason, probably, a neighbouring beehive had swarmed, and the new colony, pitching on the window-sill, was making its way into the room when the horrified nurse shut down the sash. If that well-meaning woman had only abstained from her ill-timed interference, the swarm might have settled on my lips, and I should have been endowed with that mellifluous eloquence which, in this country, leads far more surely than worth, capacity, or honest work, to the highest places in Church and State. But the opportunity was lost, and I have been obliged to content myself through life with saying what I mean in the plainest of plain language, than which, I suppose, there is no habit more ruinous to a man's prospects of advancement."

As to his debt, physical and mental, to either parent, he writes as follows:—

Physically I am the son of my mother so completely—even down to peculiar movements of the hands, which made their appearance in me as I reached the age she had when I noticed them—that I can hardly find any trace of my father in myself, except an inborn faculty for drawing, which, unfortunately, in my case, has never been cultivated, a hot temper, and that amount of tenacity of purpose which unfriendly observers sometimes call obstinacy.

My mother was a slender brunette, of an emotional and energetic temperament, and possessed of the most piercing black eyes I ever saw in a woman's head. With no more education than other women of the middle classes in her day, she had an excellent mental capacity. Her most distinguishing characteristic, however, was rapidity of thought. If one ventured to suggest that she had not taken much time to arrive at any conclusion, she would say, "I cannot help it; things flash across me."

---

\* So in the *Autobiography*, but 9.30 according to the *Family Bible*.

That peculiarity has been passed on to me in full strength; it has often stood me in good stead; it has sometimes played me sad tricks, and it has always been a danger. But, after all, if my time were to come over again, there is nothing I would less willingly part with than my inheritance of mother-wit.

Restless, talkative, untiring to the day of her death, she was at sixty-six "as active and energetic as a young woman." His early devotion to her was remarkable. Describing her to his future wife he writes:—

As a child my love for her was a passion. I have lain awake for hours crying because I had a morbid fear of her death; her approbation was my greatest reward, her displeasure my greatest punishment.

I have next to nothing to say about my childhood (he continues in the *Autobiography*). In later years my mother, looking at me almost reproachfully, would sometimes say, "Ah! you were such a pretty boy!" whence I had no difficulty in concluding that I had not fulfilled my early promise in the matter of looks. In fact, I have a distinct recollection of certain curls of which I was vain, and of a conviction that I closely resembled that handsome, courtly gentleman, Sir Herbert Oakley, who was vicar of our parish, and who was as a god to us country folk, because he was occasionally visited by the then Prince George of Cambridge. I remember turning my pinafore wrong side forwards in order to represent a surplice, and preaching to my mother's maids in the kitchen as nearly as possible in Sir Herbert's manner one Sunday morning when the rest of the family were at church. That is the earliest indication of the strong clerical affinities which my friend Mr. Herbert Spencer has always ascribed to me, though I fancy they have for the most part remained in a latent state.

There remains no record of his having been a very precocious child. Indeed, it is usually the eldest child whose necessary companionship with his elders wins him this reputation. The youngest remains a child among children longer than any other of his brothers and sisters.

One talent, however, displayed itself early. The faculty of drawing he inherited from his father. But on the queer principle that training is either unnecessary to natural capacity or even ruins it, he never received regular instruction



in drawing; and his draughtsmanship, vigorous as it was, and a genuine medium of artistic expression as well as an admirable instrument in his own especial work, never reached the technical perfection of which it was naturally capable.

The amount of instruction, indeed of any kind, which he received was scanty in the extreme. For a couple of years, from the age of eight to ten, he was given a taste of the unreformed public school life, where, apart from the rough and ready mode of instruction in vogue and the necessary obedience enforced to certain rules, no means were taken to reach the boys themselves, to guide them and help them in their school life. The new-comer was left to struggle for himself in a community composed of human beings at their most heartlessly cruel age, untempered by any external influence.

Here he had little enough of mental discipline, or that deliberate training of character which is a leading object of modern education. On the contrary, what he learnt was a knowledge of undisciplined human nature..

My regular school training (he tells us), was of the briefest, perhaps fortunately; for though my way of life has made me acquainted with all sorts and conditions of men, from the highest to the lowest, I deliberately affirm that the society I fell into at school was the worst I have ever known. We boys were average lads, with much the same inherent capacity for good and evil as any others; but the people, who were set over us cared about as much for our intellectual and moral welfare as if they were baby-farmers. We were left to the operation of the struggle for existence among ourselves; bullying was the least of the ill practices current among us. Almost the only cheerful reminiscence in connection with the place which arises in my mind is that of a battle I had with one of my classmates, who had bullied me until I could stand it no longer. I was a very slight lad, but there was a wild-cat element in me which, when roused, made up for lack of weight, and I licked my adversary effectually. However, one of my first experiences of the extremely rough-and-ready nature of justice, as exhibited by the course of things in general, arose out of the fact that I—the victor—had a black eye, while he—the vanquished—had none, so that I got

into disgrace and he did not. We made it up, and thereafter I was unmolested. One of the greatest shocks I ever received in my life was to be told a dozen years afterwards by the groom who brought me my horse in a stable-yard in Sydney that he was my quondam antagonist. He had a long story of family misfortune to account for his position; but at that time it was necessary to deal very cautiously with mysterious strangers in New South Wales, and on inquiry I found that the unfortunate young man had not only been "sent out," but had undergone more than one colonial conviction.

His brief school career was happily cut short by the break up of the Ealing establishment. On the death of Dr. Nicholas, his sons attempted to carry on the school; but the numbers declined rapidly, and George Huxley, about 1835, returned to his native town of Coventry, where he obtained the modest post of manager of the Coventry savings bank, while his daughters eked out the slender family resources by keeping school.

In the meantime the boy Tom, as he was usually called, got little or no regular instruction. But he had an inquiring mind, and a singularly early turn for metaphysical speculation. He read everything he could lay hands on in his father's library. Not satisfied with the ordinary length of the day, he used, when a boy of twelve, to light his candle before dawn, pin a blanket round his shoulders, and sit up in bed to read Hutton's *Geology*. He discussed all manner of questions with his parents and friends, for his quick and eager mind made it possible for him to have friendships with people considerably older than himself. Among these may especially be noted his medical brother-in-law, Dr. Cooke of Coventry, who had married his sister Ellen in 1839, and through whom he early became interested in human anatomy; and George Anderson May, at that time in business at Hinckley (a small weaving centre some dozen miles distant from Coventry), whom his friends who knew him afterwards in the home which he made for himself on the farm at Elford, near Tamworth, will remember for his genial spirit and native love of letters. There was a real friendship between the two. The boy of fifteen notes down

with pleasure his visits to the man of six-and-twenty, with whom he could talk freely of the books he read, and the ideas he gathered about philosophy.

Afterwards, however, their ways lay far apart, and I believe they did not meet again until the seventies, when Mr. May sent his children to be educated in London, and his youngest son was at school with me; his younger daughter studied art at the Slade School with my sisters, and both found a warm welcome in the home circle at Marlborough Place.

One of his boyish speculations was as to what would become of things if their qualities were taken away; and lighting upon Sir William Hamilton's *Logic*, he devoured it to such good effect that when, years afterwards, he came to tackle the greater philosophers, especially the English and the German, he found he had already a clear notion of where the key of metaphysic lay.

This early interest in metaphysics was another form of the intense curiosity to discover the motive principle of things, the why and how they act, that appeared in the boy's love of engineering and of anatomy. The unity of this motive and the accident which bade fair to ruin his life at the outset, and actually levied a lifelong tax upon his bodily vigour, are best told in his own words:—

As I grew older, my great desire was to be a mechanical engineer, but the fates were against this, and while very young I commenced the study of medicine under a medical brother-in-law. But, though the Institute of Mechanical Engineers would certainly not own me, I am not sure that I have not all along been a sort of mechanical engineer *in partibus infidelium*. I am now occasionally horrified to think how little I ever knew or cared about medicine as the art of healing. The only part of my professional course which really and deeply interested me was physiology, which is the mechanical engineering of living machines; and, notwithstanding that natural science has been my proper business, I am afraid there is very little of the genuine naturalist in me. I never collected anything, and species work was always a burden to me; what I cared for was the architectural and engineering part of the business, the working out the wonderful unity of plan in the thousands and thousands

of diverse living constructions, and the modifications of similar apparatuses to serve diverse ends. The extraordinary attraction I felt towards the study of the intricacies of living structure nearly proved fatal to me at the outset. I was a mere boy—I think between thirteen and fourteen years of age—when I was taken by some older student friends of mine to the first *post-mortem* examination I ever attended. All my life I have been most unfortunately sensitive to the disagreeables which attend anatomical pursuits, but on this occasion my curiosity overpowered all other feelings, and I spent two or three hours in gratifying it. I did not cut myself, and none of the ordinary symptoms of dissection-poison supervened, but poisoned I was somehow, and I remember sinking into a strange state of apathy. By way of a last chance, I was sent to the care of some good, kind people, friends of my father's, who lived in a farmhouse in the heart of Warwickshire. I remember staggering from my bed to the window on the bright spring morning after my arrival, and throwing open the casement. Life seemed to come back on the wings of the breeze, and to this day the faint odour of wood-smoke, like that which floated across the farmyard in the early morning, is as good to me as the "sweet south upon a bed of violets." I soon recovered, but for years I suffered from occasional paroxysms of internal pain, and from that time my constant friend, hypochondriacal dyspepsia, commenced his half-century of co-tenancy of my fleshly tabernacle.

Some little time after his return from the voyage of the *Rattlesnake*, Huxley succeeded in tracing his good Warwickshire friends again. A letter of May 11, 1852, from one of them, Miss K. Jaggard, tells how they had lost sight of the Huxleys after their departure from Coventry; how they were themselves dispersed by death, marriage, or retirement; and then proceeds to draw a lively sketch of the long delicate-looking lad, which clearly refers to this period or a little later.

My brother and sister who were living at Grove Fields when you visited there, have now retired from the cares of business, and are living very comfortably at Leamington. . . . I suppose you remember Mr. Joseph Russell, who used to live at Avon Dassett. He is now married and gone to live at Grove Fields, so that it is still occupied by a person of the same name as when you knew it. But it is very much altered in appearance since

the time when such merry and joyous parties of aunts and cousins used to assemble there. I assure you we have often talked of "Tom Huxley" (who was sometimes one of the party) looking so thin and ill, and pretending to make hay with one hand, while in the other he held a German book! Do you remember it? And the picnic at Scar Bank? And how often too your patience was put to the test in looking for your German books which had been hidden by some of those playful companions who were rather less inclined for learning than yourself?

It is interesting to see from this letter and from a journal, to be quoted hereafter, that he had thus early begun to teach himself German, an undertaking more momentous in its consequences than the boy dreamed of. The knowledge of German thus early acquired was soon of the utmost service in making him acquainted with the advance of biological investigation on the continent at a time when few indeed among English men of science were able to follow it at first hand, and turn the light of the newest theories upon their own researches.

It is therefore peculiarly interesting to note the cause which determined the young Huxley to take up the study of so little read a language. I have more than once heard him say that this was one half of the debt he owed to Carlyle, the other half being an intense hatred of shams of every sort and kind. The translations from the German, the constant references to German literature and philosophy, fired him to try the vast original from which these specimens were quarried, for the sake partly of the literature, but still more of the philosophy. The translation of *Wilhelm Meister*, and some of the *Miscellaneous Essays* together, with *The French Revolution*, were certainly among works of Carlyle with which he first made acquaintance, to be followed later by *Sartor Resartus*, which for many years afterwards was his Enchiridion, as he puts it in an unpublished autobiographical fragment.

By great good fortune, a singularly interesting glimpse of my father's life from the age of fifteen onwards has been preserved in the shape of a fragmentary journal which he entitled, German fashion, *Thoughts and Doings*. Begun

on September 29, 1840, it is continued for a couple of years, and concludes with some vigorous annotations in 1845, when the little booklet emerged from a three years' oblivion at the bottom of an old desk. Early as this journal is, in it the boy displays three habits afterwards characteristic of the man: the habit of noting down any striking thought or saying he came across in the course of his reading; of speculating on the causes of things and discussing the right and wrong of existing institutions; and of making scientific experiments, using them to correct his theories.

The first entry, the heading, as it were, and keynote of all the rest, is a quotation from Novalis:—"Philosophy can bake no bread; but it can prove for us God, freedom, and immortality. Which, now, is more practical, Philosophy or Economy?" The reference here given is to a German edition of Novalis, so that it seems highly probable that the boy had learnt enough of the language to translate a bit for himself, though, as appears from entries in 1841, he had still to master the grammar completely.

In science, he was much interested in electricity; he makes a galvanic battery "in view of experiment to get crystallized carbon. Got it deposited, but not crystallized." Other experiments and theorizing upon them are recorded in the following year. Another entry showing the courage of youth, deserves mention:—

"Oct. 5 (1840).—Began speculating on the cause of colours at sunset. Has any explanation of them ever been attempted?" which is supplemented by an extract "from old book."

We may also remark the early note of Radicalism and resistance to anything savouring of injustice or oppression, together with the naïve honesty of the admission that his opinions may change with years.

Oct. 25 (at Hinckley).—Read Dr. S. Smith on the Divine Government.—Agree with him partly.—I should say that a general belief in his doctrines would have a very injurious effect on morals.

Nov. 22.—. . . Had a long talk with my mother and father about the right to make Dissenters pay church rates—and

whether there ought to be any Establishment. I maintain that there ought not in both cases—I wonder what will be my opinion ten years hence? I think now that it is against all laws of justice to force men to support a church with whose opinions they cannot conscientiously agree. The argument that the rate is so small is very fallacious. It is as much a sacrifice of principle to do a little wrong as to do a great one.

*Nov. 22 (Hinckley).*—Had a long argument with Mr. May on the nature of the soul and the difference between it and matter. I maintained that it could not be proved that matter is *essentially*—as to its base—different from soul. Mr. M. wittily said, soul was the perspiration of matter.

We cannot find the absolute basis of matter: we only know it by its properties; neither know we the soul in any other way. *Cogito ergo sum* is the only thing that we *certainly* know.

Why may not soul and matter be of the same substance (*i.e.* basis whereon to fix qualities, for we cannot suppose a quality to exist *per se*—it must have a something to qualify), but with different qualities.

Let us suppose then an Eon—a something with no quality but that of existence—this Eon endued with all the intelligence, mental qualities, and that in the highest degree—is God. This combination of intelligence with existence we may suppose to have existed from eternity. At the creation we may suppose that a portion of the Eon was separated from the intelligence, and it was ordained—it became a natural law—that it should have the properties of gravitation, etc.—that is, that it should give to man the ideas of those properties. The Eon in this state is matter in the abstract. Matter, then, is Eon in the simplest form in which it possesses qualities appreciable by the senses. Out of this matter, by the superimposition of fresh qualities, was made all things that are.

1841

*Jan. 7.*—Came to Rotherhithe.\*

*June 20.*—What have I done in the way of acquiring knowledge since January?

Projects begun—

- |   |                 |
|---|-----------------|
| 1. German                               | } to be learnt. |
| 2. Italian                              |                 |
| 3. To read Müller's <i>Physiology</i> . |                 |

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\* See Chap. II.

4. To prepare for the Matriculation Examination at London University which requires knowledge of:—
  - (a) Algebra—Geometry } did not begin to read for
  - (b) Natural Philosophy } this till April.
  - (c) Chemistry.
  - (d) Greek—Latin.
  - (e) English History down to end of seventeenth century.
  - (f) Ancient History.  
English Grammar.
5. To make copious notes of all things I read.

Projects completed—

1. Partly. 2. Not at all. 3 and 5, stuck to these pretty closely.
4. (e) Read as far as Henry III. in Hume.
  - (a) Evolution and involution.
  - (b) Refraction of light—Polarisation partly.
  - (c) Laws of combination—must read them over again.
  - (d) Nothing.
  - (f) Nothing.

I must get on faster than this. I *must* adopt a fixed plan of studies, for unless this is done I find time slips away without knowing it—and let me remember this—that it is better to read a little and thoroughly, than cram a crude undigested mass into my head, though it be great in quantity.

(This is about the only resolution I have ever stuck to—1845).

[Well do I remember how in that little narrow surgery I used to work morning after morning and evening after evening at that insufferably dry and profitless book, Hume's *History*, how I worked against hope through the series of thefts, robberies, and throat-cutting in those three first volumes, and how at length I gave up the task in utter disgust and despair.

Macintosh's *History*, on the other hand, I remember reading with great pleasure, and also Guizot's *Civilisation in Europe*, the scientific theoretical form of the latter especially pleased me, but the want of sufficient knowledge to test his conclusions was a great drawback. 1845].

There follow notes of work done in successive weeks—June 20 to August 9, and September 27 to October 4.





Under the head of objective knowledge comes first Physics, including the whole body of the relations of inanimate unorganised bodies; secondly, Physiology. Including the structure and functions of animal bodies, including language and Psychology; thirdly comes History.

One object for which I have attempted to form an arrangement of knowledge is that I may test the amount of my own acquirements. I shall form an extensive list of subjects on this plan, and as I acquire any one of them I shall strike it out of the list. May the list soon get black! though at present I shall hardly be able, I am afraid, to spot the paper.

(A prophecy! a prophecy, 1845!).

*April* 1842 introduces a number of quotations from Carlyle's *Miscellaneous Writings*, "Characteristics," some clear and crisp, others sinking into Carlyle's own vein of speculative mysticism, *e.g.*

"In the mind as in the body the sign of health is unconsciousness."

"Of our thinking it is but the upper surface that we shape into articulate thought; underneath the region of argument and conscious discourse lies the region of meditation."

"Genius is ever a secret to itself."

"The healthy understanding, we should say, is neither the argumentative nor the Logical, but the Intuitive, for the end of understanding is not to prove and find reasons but to know and believe" (!)

"The ages of heroism are not ages of Moral Philosophy. Virtue, when it is philosophised of, has become aware of itself, is sickly and beginning to decline."

At the same time more electrical experiments are recorded; and theories are advanced with pros and cons to account for the facts observed.

The last entry was made three years later—

*Oct.* 1845.—I have found singular pleasure—having accidentally raked this *Büchlein* from a corner of my desk—in looking over these scraps of notices of my past existence; an illustration of J. Paul's saying that a man has but to write down his yesterday's doings, and forthwith they appear surrounded with a poetic halo.

But after all, these are but the top skimmings of these five

years' living. I hardly care to look back into the seething depths of the working and boiling mass that lay beneath all this froth, and indeed I hardly know whether I could give myself any clear account of it. Remembrances of physical and mental pain . . . absence of sympathy, and thence a choking up of such few ideas as I did form clearly within my own mind.

Grief too, yet at the misfortune of others, for I have had few properly my own; so much the worse, for in that case I might have said or done somewhat, but here was powerless.

Oh, Tom, trouble not thyself about sympathy; thou hast two stout legs and young, wherefore need a staff?

Furthermore, it is twenty minutes past two, and time to go to bed.

Büchlein, it will be long before my secretiveness remains so quiet again; make the most of what thou hast got.

## CHAPTER II

1841-1846

THE migration to Rotherhithe, noted under date of January 9, 1841, was a fresh step in his career. In 1839 both his sisters married, and both married doctors. Dr. Cooke, the husband of the elder sister, who was settled in Coventry, had begun to give him some instruction in the principles of medicine as early as the preceding June. It was now arranged that he should go as assistant to Mr. Chandler, of Rotherhithe, a practical preliminary to walking the hospitals and obtaining a medical degree in London. His experiences among the poor in the dock region of the East of London—for Dr. Chandler had charge of the parish—supplied him with a grim commentary on his diligent reading in Carlyle. Looking back on this period, he writes:—

The last recorded speech of Professor Teufelsdröckh proposes the toast 'Die Sache der Armen in Gottes und Teufelsnamen' (The cause of the Poor in Heaven's name and ——'s.) The cause of the Poor is the burden of *Past and Present*, *Chartism*, and *Latter-Day Pamphlets*. To me . . . this advocacy of the cause of the poor appealed very strongly . . . because . . . I had had the opportunity of seeing for myself something of the way the poor live. Not much, indeed, but still enough to give a terrible foundation of real knowledge to my speculations.

After telling how he came to know something of the East End, he proceeds:—

I saw strange things there—among the rest, people who came to me for medical aid, and who were really suffering from nothing but slow starvation. I have not forgotten—am not

likely to forget so long as memory holds—a visit to a sick girl in a wretched garret where two or three other women, one a deformed woman, sister of my patient, were busy shirt-making. After due examination, even my small medical knowledge sufficed to show that my patient was merely in want of some better food than the bread and bad tea on which these people were living. I said so as gently as I could, and the sister turned upon me with a kind of choking passion. Pulling out of her pocket a few pence and halfpence, and holding them out, “That is all I get for six and thirty hours’ work, and you talk about giving her proper food.”

Well, I left that to pursue my medical studies, and it so happened the shortest way between the school which I attended and the library of the College of Surgeons, where my spare hours were largely spent, lay through certain courts and alleys, Vinegar Yard and others, which are now nothing like what they were then. Nobody would have found robbing me a profitable employment in those days, and I used to walk through these wretched dens without let or hindrance. Alleys nine or ten feet wide, I suppose, with tall houses full of squalid drunken men and women, and the pavement strewn with still more squalid children. The place of air was taken by a steam of filthy exhalations; and the only relief to the general dull apathy was a roar of words—filthy and brutal beyond imagination—between the closed-packed neighbours, occasionally ending in a general row. All this almost within hearing of the traffic of the Strand, within easy reach of the wealth and plenty of the city.

I used to wonder sometimes why these people did not sally forth in mass and get a few hours’ eating and drinking and plunder to their hearts’ content, before the police could stop and hang a few of them. But the poor wretches had not the heart even for that. As a slight, wiry Liverpool detective once said to me when I asked him how it was he managed to deal with such hulking ruffians as we were among, “Lord bless you, sir, drink and disease leave nothing in them.”

This early contact with the sternest facts of the social problem impressed him profoundly. And though not actively employed in what is generally called “philanthropy,” still he did his part, hopefully but soberly, not only to throw light on the true issues and to strip away make-believe from them, but also to bring knowledge to the working classes, and to institute machinery by which ca-

capacity should be caught and led to a position where it might be useful instead of dangerous to social order.

After some time, however, he left Mr. Chandler to join his second brother-in-law,\* who had set up in the north of London, and to whom he was duly apprenticed, as his brother James had been before him. This change gave him more time and opportunity to pursue his medical education. He attended lectures at the Sydenham College, and, as has been seen, began to prepare for the matriculation examination of the University of London. At the Sydenham College he met with no little success, winning, besides certificates of merit in other departments, a prize—his first prize—for botany. His vivid recollections, given below, of this entry into the scientific arena are taken from a journal he kept for his fiancée during his absence from Sydney on the cruises of the *Rattlesnake*.

ON BOARD H.M.S. *RATTLESNAKE*, CHRISTMAS 1847.

Next summer it will be six years since I made my first trial in the world. My first public competition, small as it was, was an epoch in my life. I had been attending (it was my first summer session) the botanical lectures at Chelsea. One morning I observed a notice stuck up—a notice of a public competition for medals, etc., to take place on the 1st August (if I recollect right). It was then the end of May or thereabouts. I remember looking longingly at the notice, and some one said to me, "Why don't you go in and try for it?" I laughed at the idea, for I was very young, and my knowledge somewhat of the vaguest. Nevertheless I mentioned the matter to S.† when I returned home. He likewise advised me to try, and so I determined I would. I set to work in earnest, and perseveringly applied myself to such works as I could lay my hands on, Lindley's and Decandolle's *Systems* and the *Annales des Sciences Naturelles* in the British Museum. I tried to read Schleiden, but my German was insufficient.

For a young hand I worked really hard from eight or nine in the morning until twelve at night, besides a long hot summer's walk over to Chelsea two or three times a week to hear Lindley. A great part of the time I worked till sunrise. The

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\* John Godwin Scott.

† His brother-in-law.

result was a sort of ophthalmia which kept me from reading at night for months afterwards.

The day of examination came, and as I went along the passage to go out I well remember dear Lizzie,\* half in jest, half in earnest, throwing her shoe after me, as she said, for luck. She was alone, beside S., in the secret, and almost as anxious as I was. How I reached the examination room I hardly know, but I recollect finding myself at last with pen and ink and paper before me and five other beings, all older than myself, at a long table. We stared at one another like strange cats in a garret, but at length the examiner (Ward) entered, and before each was placed the paper of questions and sundry plants. I looked at my questions, but for some moments could hardly hold my pen, so extreme was my nervousness; but when I once fairly began, my ideas crowded upon me almost faster than I could write them. And so we all sat, nothing heard but the scratching of the pens and the occasional crackle of the examiner's *Times* as he quietly looked over the news of the day.

The examination began at eleven. At two they brought in lunch. It was a good meal enough, but the circumstances were not particularly favourable to enjoyment, so after a short delay we resumed our work. It began to be evident between whom the contest lay, and the others determined that I was one man's competitor and Stocks † (he is now in the East India service) the other. Scratch, scratch, scratch! Four o'clock came, the usual hour of closing the examination, but Stocks and I had not half done, so with the consent of the others we petitioned for an extension. The examiner was willing to let us go on as long as we liked. Never did I see man write like Stocks; one might have taken him for an attorney's clerk writing for his dinner. We went on. I had finished a little after eight, he went on till near nine, and then we had tea and dispersed.

Great were the greetings I received when I got home, where my long absence had caused some anxiety. The decision would not take place for some weeks, and many were the speculations made as to the probabilities of success. I for my part managed to forget all about it, and went on my ordinary avocations without troubling myself more than I could possibly help about it.

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\* His eldest sister, Mrs. Scott.

† John Ellerton Stocks, M.D., London, distinguished himself as a botanist in India. He travelled and collected in Beloochistan and Scinde; died 1854.

I knew too well my own deficiencies to have been either surprised or disappointed at failure, and I made a point of shattering all involuntary "castles in the air" as soon as possible. My worst anticipations were realised. One day S. came to me with a sorrowful expression of countenance. He had inquired of the Beadle as to the decision, and ascertained on the latter's authority that all the successful candidates were University College men, whereby, of course, I was excluded. I said, "Very well, the thing was not to be helped," put my best face upon the matter, and gave up all thoughts of it. Lizzie, too, came to comfort me, and, I believe, felt it more than I did. What was my surprise on returning home one afternoon to find myself suddenly seized, and the whole female household vehemently insisting on kissing me. It appeared an official-looking letter had arrived for me, and Lizzie, as I did not appear, could not restrain herself from opening it. I was second, and was to receive a medal \* accordingly, and dine with the guild on the 9th November to have it bestowed.

I dined with the company, and bore my share in both pudding and praise, but the charm of success lay in Lizzie's warm congratulation and sympathy. Since then she always took upon herself to prophesy touching the future fortunes of "the boy."

The haphazard, unsystematic nature of preliminary medical study here presented can not fail to strike one with wonder. Thomas Huxley was now seventeen; he had already had two years' "practice in pharmacy" as a testimonial put it. After a similar apprenticeship, his brother had made the acquaintance of the director of the Gloucester Lunatic Asylum, and was given by him the post of dispenser or "apothecary," which he filled so satisfactorily as to receive a promise that if he went to London for a couple of years to complete his medical training, a substitute should

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\* Silver Medal of the Pharmaceutical Society, 9th November 1842. Another botanical prize is a book—*La Botanique*, by A. Richard—with the following inscription :—

THOMAE HUXLEY  
 In Exercitatione Botanicē  
 Apud Scholam Collegii Sydenhamiensis  
 Optime Merenti  
 Hunc librum dono dedit  
 RICARDUS D. HOBLYN, Botanicēs Professor.



be appointed meanwhile to keep the place until he returned.

The opportunity to which both the brothers looked came in the shape of the Free Scholarships offered by the Charing Cross Hospital to students whose parents were unable to pay for their education. Testimonials as to the position and general education of the candidates were required, and it is curious that one of the persons applied to by the elder Huxley was J. H. Newman, at that time Vicar of Littlemore, who had been educated at Dr. Nicholas' School at Ealing.

The application for admission to the lectures and other teaching at the Hospital states of the young T. H. Huxley that "He has a fair knowledge of Latin, reads French with facility, and knows something of German. He has also made considerable progress in the Mathematics, having, as far as he has advanced, a thorough not a superficial knowledge of the subject." The document ends in the following confident words:—

I appeal to the certificates and testimonials that will be herewith submitted for evidence of their past conduct, offering prospectively that these young men, if elected to the Free Scholarships of the Charing Cross Hospital and Medical College, will be diligent students, and in all things submit themselves to the controul and guidance of the Director and Medical Officers of the establishment. A father may be pardoned, perhaps, for adding his belief that these young men will hereafter reflect credit on any institution from which they may receive their education.

The authorities replied that "although it is not usual to receive two members of the same family at the same time, the officers taking into consideration the age of Mr. Huxley, sen., the numerous and satisfactory testimonials of his respectability, and of the good conduct and merits of the candidates, have decided upon admitting Mr. J. E. and Mr. T. Huxley on this occasion."

The brothers began their hospital course on October 1, 1842. Here, after a time, my father seems to have begun working more steadily and systematically than he had done before, under the influence of a really good teacher.

Looking back (he says) on my "Lehrjahre," I am sorry to say that I do not think that any account of my doings as a student would tend to edification. In fact, I should distinctly warn ingenuous youth to avoid imitating my example. I worked extremely hard when it pleased me, and when it did not, which was a very frequent case, I was extremely idle (unless making caricatures of one's pastors and masters is to be called a branch of industry), or else wasted my energies in wrong directions. I read everything I could lay hands upon, including novels, and took up all sorts of pursuits to drop them again quite as speedily. No doubt it was very largely my own fault, but the only instruction from which I obtained the proper effect of education was that which I received from Mr. Wharton Jones, who was the lecturer on physiology at the Charing Cross School of Medicine. The extent and precision of his knowledge impressed me greatly, and the severe exactness of his method of lecturing was quite to my taste. I do not know that I have ever felt so much respect for anybody as a teacher before or since. I worked hard to obtain his approbation, and he was extremely kind and helpful to the youngster who, I am afraid, took up more of his time than he had any right to do. It was he who suggested the publication of my first scientific paper—a very little one—in the *Medical Gazette* of 1845, and most kindly corrected the literary faults which abounded in it, short as it was; for at that time, and for many years afterwards, I detested the trouble of writing, and would take no pains with it.

He never forgot his debt to Wharton Jones, and years afterwards was delighted at being able to do him a good turn, by helping to obtain a pension for him. But although in retrospect he condemns the fitfulness of his energies and his want of system, which left much to be learned afterwards, which might with advantage have been learned then, still it was his energy that struck his contemporaries. I have a story from one of them that when the other students used to go out into the court of the hospital after lectures were over, they would invariably catch sight of young Huxley's dark head at a certain window bent over a microscope while they amused themselves outside. The constant silhouette framed in the outlines of the window tickled the fancy of the young fellows, and a wag amongst them dubbed it with a name that stuck, "The Sign of the Head and Microscope."

The scientific paper, too, which he mentions, was somewhat remarkable under the circumstances. It is not given to every medical student to make an anatomical discovery, even a small one. In this case the boy of nineteen, investigating things for himself, found a hitherto undiscovered membrane in the root of the human hair, which received the name of Huxley's layer.

Speculations, too, such as had filled his mind in early boyhood, still haunted his thoughts. In one of his letters from the *Rattlesnake*, he gives an account of how he was possessed in his student days by that problem which has beset so many a strong imagination, the problem of perpetual motion, and even sought an interview with Faraday, whom he left with the resolution to meet the great man some day on a more equal footing.

March 1848.

To-day, ruminating over the manifold ins and outs of life in general, and my own in particular, it came into my head suddenly that I would write down my interview with Faraday—how many years ago? Aye, there's the rub, for I have completely forgotten. However, it must have been in either my first or second winter session at Charing Cross, and it was before Christmas I feel sure.

I remember how my long brooding perpetual motion scheme (which I had made more than one attempt to realise, but failed owing to insufficient mechanical dexterity) had been working upon me, depriving me of rest even, and heating my brain with *châteaux d'Espagne* of endless variety. I remember, too, it was Sunday morning when I determined to put the questions, which neither my wits nor my hands would set at rest, into some hands for decision, and I determined to go before some tribunal from whence appeal should be absurd.

But to whom to go? I knew no one among the high priests of science, and going about with a scheme for perpetual motion was, I knew, for most people the same thing as courting ridicule among high and low. After all I fixed upon Faraday, possibly perhaps because I knew where he was to be found, but in part also because the cool logic of his works made me hope that my poor scheme would be treated on some other principle than that of mere previous opinion one way or other. Besides, the known courtesy and affability of the man encouraged me. So I wrote

a letter, drew a plan, enclosed the two in an envelope, and tremblingly betook myself on the following afternoon to the Royal Institution.

"Is Dr. Faraday here?" said I to the porter. "No sir, he has just gone out." I felt relieved. "Be good enough to give him this letter," and I was hurrying out when a little man in a brown coat came in at the glass door. "Here is Dr. Faraday," said the man, and gave him my letter. He turned to me and courteously inquired what I wished. "To submit to you that letter, sir, if you are not occupied." "My time is always occupied, sir, but step this way," and he led me into the museum or library, for I forget which it was, only I know there was a glass case against which we leant. He read my letter, did not think my plan would answer. Was I acquainted with mechanism, what we call the laws of motion? I saw all was up with my poor scheme, so after trying a little to explain, in the course of which I certainly failed in giving him a clear idea of what I would be at, I thanked him for his attention, and went off as dissatisfied as ever. The sense of one part of the conversation I well recollect. He said "that were the perpetual motion possible, it would have occurred spontaneously in nature, and would have overpowered all other forces," or words to that effect. I did not see the force of this, but did not feel competent enough to discuss the question.

However, all this exorcised my devil, and he has rarely come to trouble me since. Some future day, perhaps, I may be able to call Faraday's attention more decidedly. *Perge modo!* "wie das Gestirn, ohne Hast, ohne Rast" (Das Gestirn in a midshipman's berth!).

In other respects also his student's career was a brilliant one. In 1843 he won the first chemical prize, the certificate stating that his "extraordinary diligence and success in the pursuit of this branch of science do him infinite honour." At the same time, he also won the first prize in the class of anatomy and physiology. On the back of Wharton Jones' certificate is scribbled in pencil: "Well, 'tis no matter. Honour pricks me on. Yea, but how if honour prick me off when I come on? How then?"

Finally, in 1845 he went up for his M.B. at London University, and won a gold medal for anatomy and physiology, being second in honours in that section.

Whatever then he might think of his own work, judged by his own standards, he had done well enough as medical students go. But a brilliant career as a student did not suffice to start him in life or provide him with a livelihood. How he came to enter the Navy is best told in his own words.

It was in the early spring of 1846, that, having finished my obligatory medical studies and passed the first M.B. examination at the London University, though I was still too young to qualify at the College of Surgeons, I was talking to a fellow-student (the present eminent physician, Sir Joseph Fayrer), and wondering what I should do to meet the imperative necessity for earning my own bread, when my friend suggested that I should write to Sir William Burnett, at that time Director-General for the Medical Service of the Navy, for an appointment. I thought this rather a strong thing to do, as Sir William was personally unknown to me, but my cheery friend would not listen to my scruples, so I went to my lodgings and wrote the best letter I could devise. A few days afterwards I received the usual official circular of acknowledgment, but at the bottom there was written an instruction to call at Somerset House on such a day. I thought that looked like business, so at the appointed time I called and sent in my card while I waited in Sir William's anteroom. He was a tall, shrewd-looking old gentleman, with a broad Scotch accent, and I think I see him now as he entered with my card in his hand. The first thing he did was to return it, with the frugal reminder that I should probably find it useful on some other occasion. The second was to ask whether I was an Irishman. I suppose the air of modesty about my appeal must have struck him. I satisfied the Director-General that I was English to the backbone, and he made some inquiries as to my student career, finally desiring me to hold myself ready for examination. Having passed this, I was in Her Majesty's Service, and entered on the books of Nelson's old ship the *Victory*, for duty at Haslar Hospital, about a couple of months after my application.

My official chief at Haslar was a very remarkable person, the late Sir John Richardson, an excellent naturalist and far-famed as an indomitable Arctic traveller. He was a silent, reserved man, outside the circle of his family and intimates; and having a full share of youthful vanity, I was extremely disgusted to find that "Old John," as we irreverent youngsters called him, took not the slightest notice of my worshipful self,

either the first time I attended him, as it was my duty to do, or for some weeks afterwards. I am afraid to think of the lengths to which my tongue may have run on the subject of the churlishness of the chief, who was, in truth, one of the kindest-hearted and most considerate of men. But one day, as I was crossing the hospital square, Sir John stopped me and heaped coals of fire on my head by telling me that he had tried to get me one of the resident appointments, much coveted by the assistant-surgeons, but that the Admiralty had put in another man. "However," said he, "I mean to keep you here till I can get you something you will like," and turned upon his heel without waiting for the thanks I stammered out. That explained how it was I had not been packed off to the West Coast of Africa like some of my juniors, and why, eventually, I remained altogether seven months at Haslar.

After a long interval, during which "Old John" ignored my existence almost as completely as before, he stopped me again as we met in a casual way, and describing the service on which the *Rattlesnake* was likely to be employed, said that Captain Owen Stanley, who was to command the ship, had asked him to recommend an assistant surgeon who knew something of science; would I like that? Of course I jumped at the offer. "Very well; I give you leave; go to London at once and see Captain Stanley." I went, saw my future commander, who was very civil to me, and promised to ask that I should be appointed to his ship, as in due time I was. It is a singular thing that during the few months of my stay at Haslar I had among my mess-mates two future Directors-General of the Medical Service of the Navy (Sir Alexander Armstrong and Sir John Watt-Reid), with the present President of the College of Physicians, and my kindest of doctors, Sir Andrew Clark.

A letter to his eldest sister, Lizzie, dated from Haslar May 24, 1846, shows how he regarded the prospect now opening before him.

. . . As I see no special queries in your letter, I think I shall go on to tell you what that same way of life is likely to be—my fortune having already been told for me (for the next five years at least). I told you in my last that I was likely to have a permanency here. Well, I was recommended by Sir John Richardson, and should have certainly had it, had not (luckily) the Admiralty put in a man of their own. Having a good impudent

faith in my own star (Wie das Gestirn, ohne Hast, ohne Rast), I knew this was only because I was to have something better, and so it turned out; for a day or two after I was ousted from the museum, Sir J. Richardson (who has shown himself for some reason or another a special good friend to me) told me that he had received a letter from Captain Owen Stanley, who is to command an *exploring expedition* to New Guinea (not coast of Africa, mind), requesting him to recommend an assistant surgeon for this expedition—would I like the appointment? As you may imagine I was delighted at the offer, and immediately accepted it. I was recommended accordingly to Captain Stanley and Sir W. Burnett, and I shall be appointed as soon as the ship is in commission. We are to have the *Rattlesnake*, a 28-gun frigate, and as she will fit out here I shall have no trouble. We sail probably in September.

New Guinea, as you may be aware, is a place almost unknown, and our object is to bring back a full account of its Geography, Geology, and Natural History. In the latter department with which I shall have (in addition to my medical functions) somewhat to do, we shall form one grand collection of specimens and deposit it in the British Museum or some other public place, and this main object being always kept in view, we are at liberty to collect and work for ourselves as we please. Depend upon it unless some sudden attack of laziness supervenes, such an opportunity shall not slip unused out of my hands. The great difficulty in such a wide field is to choose an object. In this point, however, I hope to be greatly assisted by the scientific folks, to many of whom I have already had introductions (Owen, Gray, Grant, Forbes), and this, I assure you, I look upon as by no means the least of the advantages I shall derive from being connected with the expedition. I have been twice to town to see Captain Stanley. He is a son of the Bishop of Norwich, is an exceedingly gentlemanly man, a thorough scientific enthusiast, and shows himself altogether very much disposed to forward my views in every possible way. Being a scientific man himself he will take care to have the ship's arrangements as far as possible in harmony with scientific pursuits—a circumstance you would appreciate as highly as I do if you were as well acquainted as I now am with the ordinary opportunities of an assistant surgeon. Furthermore, I am given to understand that if one does anything at all, promotion is almost certain. So that altogether I am in a very fair way, and would snap my fingers at the Grand Turk. Wharton Jones

was delighted when I told him about my appointment. Dim visions of strangely formed corpuscles seemed to cross his imagination like the ghosts of the kings in *Macbeth*.

What seems his head  
The likeness of a nucleated cell has on.

The law's delays are proverbial, but on this occasion, as on the return of the *Rattlesnake*, the Admiralty seem to have been almost as provoking to the eager young surgeon as any lawyer could have been. The appointment was promised in May; it was not made till October. On the 6th of that month there is another letter to his sister, giving fuller particulars of his prospects on the voyage:—

MY DEAREST LIZZIE—At last I have really got my appointment and joined my ship. I was so completely disgusted with the many delays that had occurred that I made up my mind not to write to anybody again until I had my commission in my hand. Henceforward, like another Jonah, my dwelling-place will be the "inwards" of the *Rattlesnake*, and upon the whole I really doubt whether Jonah was much worse accommodated, so far as room goes, than myself. My total length, as you are aware, is considerable, 5 feet 11 inches, possibly, but the height of the lower deck of the *Rattlesnake*, which will be my especial location, is at the outside 4 feet 10 inches. What I am to do with the superfluous foot I cannot divine. Happily, however, there is a sort of skylight into the berth, so that I shall be able to sit with the body in it and my head out.

Apart from joking, however, this is not such a great matter, and it is the only thing I would see altered in the whole affair. The officers, as far as I have seen them, are a very gentlemanly, excellent set of men, and considering we are to be together for four or five years, that is a matter of no small importance. I am not given to be sanguine, but I confess I expect a good deal to arise out of this appointment. In the first place, surveying ships are totally different from the ordinary run of men-of-war. The requisite discipline is kept up, but not in the martinet style. Less form is observed. From the men who are appointed having more or less scientific turns, they have more respect for one another than that given by mere position in the service, and hence that position is less taken advantage of. They are brought more into contact, and hence those engaged in the surveying service almost proverbially stick by one another. To



me, whose interest in the service is almost all to be made, this is a matter of no small importance.

Then again, in a surveying ship you can work. In an ordinary frigate if a fellow has the talents of all the scientific men from Archimedes downwards compressed into his own peculiar skull they are all lost. Even if it were possible to study in a midshipmen's berth, you have not room in your "chat" for more than a dozen books. But in the *Rattlesnake* the whole poop is to be converted into a large chart-room with bookshelves and tables and plenty of light. There I may read, draw, or microscopise at pleasure, and as to books, I have a *carte blanche* from the Captain to take as many as I please, of which permission we shall avail ourself—rather—and besides all this, from the peculiar way in which I obtained this appointment, I shall have a much wider swing than assistant surgeons in general get. I can see clearly that certain branches of the natural history work will fall into my hands if I manage properly through Sir John Richardson, who has shown himself a very kind friend all throughout, and also through Captain Stanley I have been introduced to several eminent zoologists—to Owen and Gray and Forbes of King's College. From all these men much is to be learnt which becomes peculiarly my own, and can of course only be used and applied by me. From Forbes especially I have learned and shall learn much with respect to dredging operations (which bear on many of the most interesting points of zoology). In consequence of this I may very likely be entrusted with the carrying of them out, and all that is so much the more towards my opportunities. Again, I have learnt the calotype process for the express purpose of managing the calotype apparatus, for which Captain Stanley has applied to the Government.

And having once for all enumerated all these meaner prospects of mere personal advancement, I must confess I do glory in the prospect of being able to give myself up to my own favourite pursuits without thereby neglecting the proper duties of life. And then perhaps by the following of my favourite motto—

Wie das Gestirn,  
Ohne Hast,  
Ohne Rast—

something may be done, and some of Sister Lizzie's fond imaginations turn out not altogether untrue.

I perceive that I have nearly finished a dreadfully egotistical letter, but I know you like to hear of my doings, so shall not

apologise. Kind regards to the Doctor and kisses to the babbies. Write me a long letter all about yourselves.—Your affect. brother,

T. H. HUXLEY.

One more description to complete the sketch of his quarters on board the *Rattlesnake*. It is from a letter to his mother, written at Plymouth, where the *Rattlesnake* put in after leaving Portsmouth. The comparison with the ordinary quarters of an assistant-surgeon, and the shifts to which a studious man might be put in his endeavour to find a quiet spot to work in, have a flavour of Mr. Midshipman Easy about them to relieve the deplorable reality of his situation:—

You will be very glad to know that I am exceedingly comfortable here. My cabin has now got into tolerable order, and what with my books—which are, I am happy to say, not a few—my gay curtain and the spicy oilcloth which will be down on the floor, looks most respectable. Furthermore, although it is an unquestionably dull day I have sufficient light to write here, without the least trouble, to read, or even if necessary, to use my microscope. I went to see a friend of mine on board the *Recruit* the other day, and truly I hugged myself when I compared my position with his. The berth where he and seven others eat their daily bread is hardly bigger than my cabin, except in height—and, of course, he has to sleep in a hammock. My friend is rather an eccentric character, and, being missed in the ship, was discovered the other day reading in the maintop—the only place, as he said, sufficiently retired for study. And this is really no exaggeration. If I had no cabin I should take to drinking in a month.

It was during this period of waiting that he attended his first meeting of the British Association, which was held in 1846 at Southampton. Here he obtained from Professor Edward Forbes one of his living specimens of *Amphioxus lanceolatus*, and made an examination of its blood. The result was a short paper read at the following meeting of the Association,\* which showed that in the composition of its blood this lowly vertebrate approached very near the invertebrates.

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\* "Examination of the Corpuscles of the Blood of *Amphioxus lanceolatus*," *British Association Report*, 1847, ii. p. 95, and *Sci. Memoirs*, i.

## CHAPTER III

1846-1849

It is a curious coincidence that, like two other leaders of science, Charles Darwin and Joseph Dalton Hooker, their close friend Huxley began his scientific career on board one of Her Majesty's ships. He was, however, to learn how little the British Government of that day, for all its professions, really cared for the advancement of knowledge.\* But of the immense value to himself of these years of hard training, the discipline, the knowledge of men and of the capabilities of life, even without more than the barest necessities of existence—of this he often spoke. As he puts it in his Autobiography:—

Life on board Her Majesty's ships in those days was a very different affair from what it is now, and ours was exceptionally rough, as we were often many months without receiving letters or seeing any civilised people but ourselves. In exchange, we had the interest of being about the last voyagers, I suppose, to whom it could be possible to meet with people who knew noth-

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\* The key to this attitude on the part of the Admiralty is to be found in the scathing description in Briggs' *Naval Administration from 1827 to 1892*, p. 92, of the ruinous parsimony of either political party at this time with regard to the navy—a policy the results of which were only too apparent at the outbreak of the Crimean War. I quote a couple of sentences, "The navy estimates were framed upon the lowest scale, and reduction pushed to the very verge of danger." "Even from a financial point of view the course pursued was the reverse of economical, and ultimately led to wasteful and increased expenditure." Thus the liberal professions of the Admiralty were not fulfilled; its goodwill gave the young surgeon three and a half years of leave from active service; with an obdurate treasury, it could do no more.

ing of firearms—as we did on the south coast of New Guinea—and of making acquaintance with a variety of interesting savage and semi-civilised people. But, apart from experience of this kind and the opportunities offered for scientific work, to me, personally, the cruise was extremely valuable. It was good for me to live under sharp discipline; to be down on the realities of existence by living on bare necessities: to find how extremely well worth living life seemed to be when one woke up from a night's rest on a soft plank, with the sky for canopy, and cocoa and weevilly biscuit the sole prospect for breakfast; and, more especially, to learn to work for the sake of what I got for myself out of it, even if it all went to the bottom and I along with it. My brother officers were as good fellows as sailors ought to be and generally are, but, naturally, they neither knew nor cared anything about my pursuits, nor understood why I should be so zealous in pursuit of the objects which my friends, the middies, christened "Buffons," after the title conspicuous on a volume of the *Suites à Buffon*, which stood on my shelf in the chart-room.

On the whole, life among the company of officers was satisfactory enough.\* Huxley's immediate superior, John Thompson, was a man of sterling worth; and Captain Stanley was an excellent commander, and sympathetic withal. Among Huxley's messmates there was only one, the ship's clerk, who ever made himself actively disagreeable, and a quarrel with him only served to bring into relief the young surgeon's integrity and directness of action. After some dispute, in which he had been worsted, this gentleman sought to avenge himself by dropping mysterious hints as to Huxley's conduct before joining the ship. He had been treasurer of his mess; there had been trouble about the accounts, and a scandal had barely been averted. This was not long in coming to Huxley's ears. Furiously indignant as he was, he did not lose his self-control; but promptly

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\* The Assistant-Surgeon messed in the gun-room with the middies. A man in the midst of a lot of boys, with hardly any grown-up companions, often has a rather unenviable position; but, says Captain Heath, who was one of these middies, Huxley's constant good spirits and fun, when he was not absorbed in his work, his freedom from any assumption of superiority over them, made the boys his good comrades and allies.

inviting the members of the wardroom to meet as a court of honour, laid his case before them, and challenged his accuser to bring forward any tittle of evidence in support of his insinuations. The latter had nothing to say for himself, and made a formal retraction and apology. A signed account of the proceedings was kept by the first officer, and a duplicate by Huxley, as a defence against any possible revival of the slander.

On December 3, 1846, the *Rattlesnake* frigate left Spithead, but touched again at Plymouth to ship £65,000 of specie for the Cape. This delay was no pleasure to the young Huxley; it only served to renew the pain of parting from home, so that, after writing a last letter to reassure his mother as to the comfort of his present quarters, he was glad to lose sight of the English coast on the 11th.

Madeira was reached on the 18th. On the 26th they sailed for Rio de Janeiro, where they stayed from January 23 to February 2, 1847. Here Huxley had his first experience of tropical dredging in Botafago Bay, with Macgillivray, naturalist to the expedition. It was a memorable occasion, the more so, because in the absence of a sieve they were compelled to use their hands as strainers the first day. Happily the want was afterwards supplied by a meat cover. From the following letter it seems that several prizes of value were taken in the dredge:—

RIO JANEIRO, *Jan.* 24, 1847.

MY DEAR MOTHER—Four weeks of lovely weather and uninterrupted fair winds brought us to this southern fairyland. In my last letter I told you a considerable yarn about Madeira, I guess, and so for fear lest you should imagine me scenery mad I will spare you any description of Rio Harbour. Suffice it to say that it contends with the Bay of Naples for the title of the most beautiful place in the world. It must beat Naples in luxuriance and variety of vegetation, but from all accounts, to say nothing of George's \* picture, falls behind it in the colours of sky and sea, that of the latter being in the harbour and for some distance outside of a dirty olive green like the washings of a painter's palette.

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\* His eldest brother.

We have come in for the purpose of effecting some trifling repairs, which, though not essential to the safety of the ship, will nevertheless naturally enhance the comfort of its inmates. This you will understand when I tell you that in consequence of these same defects I have had water an inch or two deep in my cabin, wish-washing about ever since we left Madeira.

We crossed the line on the 13th of this month, and as one of the uninitiated I went through the usual tomfoolery practised on that occasion. The affair has been too often described for me to say anything about it. I had the good luck to be ducked and shaved early, and of course took particular care to do my best in serving out the unhappy beggars who had to follow. I enjoyed the fun well enough at the time, but unquestionably it is on all grounds a most pernicious custom. It swelled our sick list to double the usual amount, and one poor fellow, I am sorry to say, died of the effects of pleurisy then contracted.

We have been quite long enough at sea now to enable me to judge how I shall get on in the ship, and to form a very clear idea of how it fits me and how I fit it. In the first place I am exceedingly well and exceedingly contented with my lot. My opinion of the advantages lying open to me increases rather than otherwise as I see my way about me. I am on capital terms with all the superior officers, and I find them ready to give me all facilities. I have a place for my books and microscope in the chart room, and there I sit and read in the morning much as though I were in my rooms in Agar Street. My immediate superior, Johnny Thompson, is a long-headed good fellow without a morsel of humbug about him—a man whom I thoroughly respect, both morally and intellectually. I think it will be my fault if we are not fast friends through the commission. One friend on board a ship is as much as anybody has a right to expect.

It is just the interval between the sea and the land breezes, the sea like glass, and not a breath stirring. I shall become soup if I do not go on deck. Temp. in sun at noon 86 in shade, 139 in sun. *N.B.*—It has been up to 89 in shade, 139 in sun since this.

*March 28.*—I see I concluded with a statement of temp. Since then it has been considerably better—140 in sun; however, in the shade it rarely rises above 86 or so, and when the sea or land breezes are blowing this is rather pleasant than otherwise.

I have been ashore two or three times. The town is like

most Portuguese towns, hot and stinking, the odours here being improved by a strong flavour of nigger from the slaves, of whom there is an immense number. They seem to do all the work, and their black skins shine in the sun as though they had been touched up with Warren, 30 Strand. They are mostly in capital condition, and on the whole look happier than the corresponding class in England, the manufacturing and agricultural poor, I mean. I have a much greater respect for them than for their beastly Portuguese masters, than whom there is not a more vile, ignorant, and besotted nation under the sun. I only regret that such a glorious country as this should be in such hands. Had Brazil been colonised by Englishmen, it would by this time have rivalled our Indian Empire.

The naturalist Macgillivray and I have had several excursions under pretence of catching butterflies, etc. On the whole, however, I think we have been most successful in imbibing sherry cobbler, which you get here in great perfection. By the way, tell Cooke,\* with my kindest regards, that — is a lying old thief, many of the things he told me about Macgillivray, *e.g.*, being an ignoramus in natural history, etc. etc., having proved to be lies. He is at any rate a very good ornithologist, and, I can testify, is exceedingly zealous in his vocation as a collector. As in these (points) Mr. —'s statements are unquestionably false, I must confess I feel greatly inclined to disbelieve his other assertions.

*March 29.*—We sail hence on Sunday for the Cape, so I will finish up. If you have not already written to me at that place, direct your letters to H.M.S. *Rattlesnake*, Sydney (to wait arrival). We shall probably be at the Cape some weeks surveying, thence shall betake ourselves to the Mauritius, and leave a card on Paul and Virginia, thence on to Sydney; but it is of no use to direct to any place but the last.

*P.S.*—The Rattlesnakes are not idle. We shall most likely have something to say to the English savans before long. If I have any friz in the fire I will let you know.

He gives a fuller account of this piece of work in a letter to his sister, dated Sydney, August 1, 1847. The two papers in question, as appears from the briefest notice in the *Proceedings of the Linnean Society*, ascribing them to William (!) Huxley, were read in 1849:—

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\* His brother-in-law.

In my last letter I think I mentioned to you that I had worked out and sent home to the President of the Linnæan Soc., through Capt. Stanley, an account of *Physalia*, or Portuguese man-of-war as it is called, an animal whose structure and affinities had never been properly worked out. The careful investigation I made gave rise to several new ideas covering the whole class of animals to which this creature belongs, and these ideas I have had the good fortune to have had many opportunities of working out in the course of our subsequent wanderings, so that I am provided with materials for a second paper far more considerable in extent, and embracing an altogether wider field. This second paper is now partly *in esse*—that is, written out—and partly *in posse*—that is, in my head; but I shall send it before leaving. Its title will be "Observations upon the Anatomy of the Diphydæ, and upon the Unity of Organisation of the Diphydæ and Physophoridæ," and it will have lots of figures to illustrate it. Now when we return from the north I hope to have collected materials for a much bigger paper than either of these, and to which they will serve as steps. If my present anticipations turn out correct, this paper will achieve one of the great ends of Zoology and Anatomy, viz. the reduction of two or three apparently widely separated and incongruous groups into modifications of the single type, every step of the reasoning being based upon anatomical facts. There! Think yourself lucky you have only got that to read instead of the slight abstract of all three papers with which I had some intention of favouring you.\*

But five years ago you threw a slipper after me for luck on my first examination, and I must have you to do it for everything else.

At the Cape a stay of a month was made, from March 6 to April 10, and certain surveying work was done, after which the *Rattlesnake* sailed for Mauritius. In spite of the fact that the novelty of tropical scenery had worn off, the place made a deep impression. He writes to his mother, May 15, 1847:—

After a long and somewhat rough passage from the Cape, we made the highland of the Isle of France on the afternoon of the

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\* These papers are to be found in vol. i. of the *Scientific Memoirs* of T. H. Huxley, p. 9.



3rd of this month, and passing round the northern extremity of the island, were towed into Port Louis by the handsomest of tugs about noon on the 4th. In my former letter I have spoken to you of the beauty of the places we have visited, of the picturesque ruggedness of Madeira, the fine luxuriance of Rio, and the rude and simple grandeur of South Africa. Much of my admiration has doubtless arisen from the novelty of these tropical or semi-tropical scenes, and would be less vividly revived by a second visit. I have become in a manner *blasé* with fine sights and something of a critic. All this is to lead you to believe that I have really some grounds for the raptures I am going into presently about Mauritius. In truth it is a complete paradise, and if I had nothing better to do, I should pick up some pretty French Eve (and there are plenty) and turn Adam. *N.B.* There are *no* serpents in the island.

This island is, you know, the scene of St. Pierre's beautiful story of Paul and Virginia, over which I suppose most people have sentimentalised at one time or another of their lives. Until we reached here I did not know that the tale was like the lady's improver—a fiction founded on fact, and that Paul and Virginia were at one time flesh and blood, and that their veritable dust was buried at Pamplemousses in a spot considered as one of the lions of the place, and visited as classic ground. Now, though I never was greatly given to the tender and sentimental, and have not had any tendencies that way greatly increased by the elegancies and courtesies of a midshipman's berth,—not to say that, as far as I recollect, Mdlle. Virginia was a bit of a prude, and M. Paul a pump,—yet were it but for old acquaintance sake, I determined on making a pilgrimage. Pamplemousses is a small village about seven miles from Port Louis, and the road to it is lined by rows of tamarind trees, of cocoanut trees, and sugar-canes. I started early in the morning in order to avoid the great heat of the middle of the day, and having breakfasted at Port Louis, made an early couple of hours' walk of it, meeting on my way numbers of the coloured population hastening to market in all the varieties of their curious Hindoo costume. After some trouble I found my way to the "Tombeaux" as they call them. They are situated in a garden at the back of a house now in the possession of one Mr. Geary, an English mechanist, who puts up half the steam engines for the sugar mills in the island. The garden is now an utter wilderness, but still very beautiful; round it runs a grassy path, and in the middle of the path on each side towards the further extremity of the garden is a

funeral urn supported on a pedestal, and as dilapidated as the rest of the affair. These dilapidations, as usual, are the work of English visitors, relic-hunters, who are as shameless here as elsewhere. I was exceedingly pleased on the whole with my excursion, and when I returned I made a drawing of the place, which I will send some day or other.

Since this I have made, in company with our purser and a passenger, Mr. King, a regular pedestrian trip to see some very beautiful falls up the country.

Leaving Mauritius on May 17, they prolonged their voyage to Sydney by being requisitioned to take more specie to Hobart Town, so that Sydney was not reached until July 16, eight months since they had had news of home.

The three months spent in this first visit to Sydney proved to be one of the most vital periods in the young surgeon's career. From boyhood up, vaguely conscious of unrest, of great powers within him working to find expression, he had yet been to a certain extent driven in upon himself. He had been somewhat isolated from those of his own age by his eagerness for problems about which they cared nothing; and the tendency to solitude, the habit of outward reserve imposed upon an unusually warm nature, were intensified by the fact that he grew up in surroundings not wholly congenial. One member alone of his family felt with him that complete and vivid sympathy which is so necessary to the full development of such a nature. When he was fourteen this sister married and left home, but the bond between them was not broken. In some ways it was strengthened by the lad's love for her children; by his grief, scarcely less than her own, at the death of her eldest little girl. Moreover they were brought into close companionship for a considerable time when, after his dismal period of apprenticeship at Rotherhithe—to which he could never look back without a shudder—he came to work under her husband. She had encouraged him in his studies; had urged him to work for the Botanical prize at Sydenham College; had brightened his life with her sympathy, and believed firmly in the brilliant future which awaited him—a

belief which for her sake, if for nothing else, he was eager to justify by his best exertions.

He had not had, so far, much opportunity of entering the social world; but his visit to Sydney gave him an opportunity of entering a good society to which his commission in the navy was a sufficient introduction. He was eager to find friendships if he could, for his reserve was anything but misanthropic. It was not long before he made the acquaintance of William Macleay, a naturalist of wide research and great speculative ability; and struck up a close friendship with William Fanning, one of the leading merchants of the town, a friendship which was to have momentous consequences. For it was at Fanning's house that he met his future wife, Miss Henrietta Anne Heathorn, for whom he was to serve longer and harder than Jacob thought to serve for Rachel, but who was to be his help and stay for forty years, in his struggles ready to counsel, in adversity to comfort; the critic whose judgment he valued above almost any, and whose praise he cared most to win; his first care and his latest thought, the other self, whose union with him was a supreme example of mutual sincerity and devotion.

It was a case of love, if not actually at first sight, yet of very rapid growth when he came to learn the quiet strength and tenderness of her nature as displayed in the management of her sister's household. A certain simplicity and directness united with an unusual degree of cultivation, had attracted him from the first. She had been two years at school in Germany, and her knowledge of German and of German literature brought them together on common ground. Things ran very smoothly at the beginning, and the young couple, whose united ages amounted to forty-four years, became engaged.

The marriage was to take place on his promotion to the rank of full surgeon—a promotion he hoped to attain speedily at the conclusion of the voyage on the strength of his scientific work, for this was the inducement held out by the Admiralty to energetic subalterns. The following letter to his sister describes the situation:—

SYDNEY HARBOUR, *March 21, 1848.*

. . . I have deferred writing to you in the hope of knowing something from yourself of your doings and whereabouts, and now that we are on the eve of departing for a long cruise in Torres Straits, I will no longer postpone the giving you some account of "was ist geschehen" on this side of the world. We spent three months in Sydney, and a gay three months of it we had,—nothing but balls and parties the whole time. In this corner of the universe, where men of war are rather scarce, even the old *Rattlesnake* is rather a lion, and her officers are esteemed accordingly. Besides, to tell you the truth, we are rather agreeable people than otherwise, and can manage to get up a very decent turn-out on board on occasion. What think you of your grave, scientific brother turning out a ball-goer and doing the "light fantastic" to a great extent? It is a great fact, I assure you. But there is a method in my madness. I found it exceedingly disagreeable to come to a great place like Sydney and think there was not a soul who cared whether I was alive or dead, so I determined to go into what society was to be had and see if I could not pick up a friend or two among the multitude of the empty and frivolous. I am happy to say that I have had more success than I hoped for or deserved, and then as now, two or three houses where I can go and feel myself at home at all times. But my "home" in Sydney is the house of my good friend Mr. Fanning, one of the first merchants in the place. But thereby hangs a tale which, of all people in the world, I must tell you. Mrs. Fanning has a sister, and the dear little sister and I managed to fall in love with one another in the most absurd manner after seeing one another—I will not tell you how few times, lest you should laugh. Do you remember how you used to talk to me about choosing a wife? Well, I think that my choice would justify even your fastidiousness. . . . I think you will understand how happy her love ought to and does make me. I fear that in this respect indeed the advantage is on my side, for my present wandering life and uncertain position must necessarily give her many an anxious thought. Our future is indeed none of the clearest. Three years at the very least must elapse before the *Rattlesnake* returns to England, and then unless I can write myself into my promotion or something else, we shall be just where we were. Nevertheless I have the strongest persuasion that four years hence I shall be married and settled in England. We shall see.

I am getting on capitally at present. Habit, inclination, and now a sense of duty keep me at work, and the nature of our cruise affords me opportunities such as none but a blind man would fail to make use of. I have sent two or three papers home already to be published, which I have great hopes will throw light upon some hitherto obscure branches of natural history, and I have just finished a more important one, which I intend to get read at the Royal Society. The other day I submitted it to William Macleay (the celebrated propounder of the Quinary system), who has a beautiful place near Sydney, and, I hear, "werry much approves what I have done." All this goes to the comforting side of the question, and gives me hope of being able to follow out my favourite pursuits in course of time, without hindrance to what is now the main object of my life. I tell Netty to look to being a "Frau Professorin" one of these odd days, and she has faith, as I believe would have if I told her I was going to be Prime Minister.

We go to the northward again about the 23rd of this month (April), and shall be away for ten or twelve months surveying in Torres Straits. I believe we are to refit in Port Essington, and that will be the only place approaching to civilisation that we shall see for the whole of that time; and after July or August next, when a provision ship is to come up to us, we shall not even get letters. I hope and trust I shall hear from you before then. Do not suppose that my new ties have made me forgetful of old ones. On the other hand, these are if anything strengthened. Does not my dearest Nettie love you as I do! and do I not often wish that you could see and love and esteem her as I know you would. We often talk about you, and I tell her stories of old times.

Another letter, a year later, gives his mother the answers to a string of questions which, mother-like, she had asked him, thirsting for exact and minute information about her future daughter-in-law:—

SYDNEY, *Feb.* 1, 1849.

(After describing how he had just come back from a nine months' cruise)—First and foremost, my dear mother, I must thank you for your very kind letter of September 1848. I read the greater part of it to Nettie, who was as much pleased as I with your kindly wishes towards both of us. Now I suppose I must do my best to answer your questions. First, as to age, Nettie is about three months younger than myself—that is the

difference in *our years*, but she is *in fact* as much younger than her years as I am older than mine. Next, as to complexion she is exceedingly fair, with the Saxon yellow hair and blue eyes. Then as to face, I really don't know whether she is pretty or not. I have never been able to decide the matter in my own mind. Sometimes I think she is, and sometimes I wonder how the idea ever came into my head. Whether or not, her personal appearance has nothing whatever to do with the hold she has upon my mind, for I have seen hundreds of prettier women. But I never met with so sweet a temper, so self-sacrificing and affectionate a disposition, or so pure and womanly a mind, and from the perfectly intimate footing on which I stand with her family I have plenty of opportunities of judging. As I tell her, the only great folly I am aware of her being guilty of was the leaving her happiness in the hands of a man like myself, struggling upwards and certain of nothing.

As to my future intentions I can say very little about them. With my present income, of course, marriage is rather a bad look out, but I do not think it would be at all fair towards N. herself to leave this country without giving her a wife's claim upon me. . . . It is very unlikely I shall ever remain in the colony. Nothing but a very favourable chance could induce me to do so.

Much must depend upon how things go in England. If my various papers meet with any success, I may perhaps be able to leave the service. At present, however, I have not heard a word of anything I have sent. Professor Forbes has, I believe, published some of MacGillivray's letters to him, but he has apparently forgotten to write to MacGillivray himself, or to me. So I shall certainly send him nothing more, especially as Mr. MacLeay (of this place, and a great man in the naturalist world) has offered to get anything of mine sent to the Zoological Society.

In the paper mentioned in the letter of March 21, above ("On the Anatomy and Affinities of the Family of the Medusae"), Huxley aimed at "giving broad and general views of the whole class, considered as organised upon a given type, and inquiring into its relations with other families," unlike previous observers whose patience and ability had been devoted rather to "stating matters of detail concerning particular genera and species." At the outset, section 8 (*Sci. Mem.*, i. 11), he states—

I would wish to lay particular stress upon the composition of this (the stomach) and other organs of the Medusæ out of *two distinct membranes*, as I believe that it is one of the essential peculiarities of their structure, and that a knowledge of the fact is of great importance in investigating their homologies. I will call these two membranes as such, and independently of any modifications into particular organs, "foundation membranes."

And in section 56 (p. 23) one of the general conclusions which he deduces from his observations, is

That a Medusa consists essentially of two membranes inclosing a variously-shaped cavity, inasmuch as its various organs are so composed,

a peculiarity shared by certain other families of zoophytes. This is the point which that eminent authority, Professor G. J. Allman, had in his mind when he wrote to call my attention

to a fact which has been overlooked in all the notices I have seen, and which I regard as one of the greatest claims of his splendid work on the recognition of zoologists. I refer to his discovery that the body of the Medusæ is essentially composed of two membranes, an outer and an inner, and his recognition of these as the homologues of the two primary germinal leaflets in the vertebrate embryo. Now this discovery stands at the very basis of a philosophic zoology, and of a true conception of the affinities of animals. It is the ground on which Hæckel has founded his famous Gastræa Theory, and without it Kowalesky could never have announced his great discovery of the affinity of the Ascidiæ and Vertebrates, by which zoologists had been startled.

## CHAPTER IV

1848-1850

THE whole cruise of the *Rattlesnake* lasted almost precisely four years, her stay in Australian waters nearly three. Of this time altogether eleven months were spent at Sydney, namely, July 16 to October 11, 1847; January 14 to February 2, and March 9 to April 29, 1848; January 24 to May 8, 1849; and February 14 to May 2, 1850. The three months of the first northern cruise were spent in the survey of the Inshore Passage—the passage, that is, within the Great Barrier Reef for ships proceeding from India to Sydney. In 1848, while waiting for the right season to visit Torres Straits, a short cruise was made in February and March, to inspect the lighthouses in Bass' Straits. It was on this occasion that Huxley visited Melbourne, then an insignificant town, before the discovery of gold had brought a rush of immigrants.

The second northern cruise of 1848, which lasted nine months, had for its object the completion of the survey of the Inner Passage as far as New Guinea and the adjoining archipelago. The third cruise in 1849-50 again lasted nine months, and continued the survey in Torres Straits, the Louisiade archipelago, and the south-eastern part of New Guinea. After this the original plan was to make a fourth cruise, filling up the charts of the Inner Passage on the east coast, and surveying the straits of Alass between Lombok and Sumbawa in the Malay Archipelago; then, instead of returning to Sydney, to proceed to Singapore and so home by the Cape. But these plans were



altered by the untimely death of Captain Stanley on March 13, and the *Rattlesnake* sailed for England direct in May 1850.

There was a great monotony about these cruises, particularly to those who were not constantly engaged in the active work of surveying. The ship sailed slowly from place to place, hunting out reefs and islets; a stay of a few days would be made at some lonely island, while charting expeditions went out in the boats or supplies of water and fresh fruits were laid in. On the second expedition there were two cases of scurvy on board by the time the mail from Sydney reached the ship at Cape York with letters and lime-juice, the first reminder of civilisation for four months and a half. On this cruise there was an unusual piece of interest in Kennedy's ill-fated expedition, which the *Rattlesnake* landed in Rockingham Bay, and trusted to meet again at Cape York. Happy it was for Huxley that his duties forbade him to accept Kennedy's proposal to join the expedition. After months of weary struggles in the dense scrub, Kennedy himself, who had pushed on for help with his faithful black man Jacky, was speared by the natives when almost in sight of Cape York; Jack barely managed to make his way there through his enemies, and guided a party to the rescue of the two starved and exhausted survivors of the disease-stricken camp by the Sugarloaf Hill. It was barely time. Another hour, and they too would have been killed by the crowd of blackfellows who hovered about in hopes of booty, and were only dispersed for a moment by the rescue party.

On the third cruise there were a few adventures more directly touching the *Rattlesnake*. Twice the landing parties, including Huxley, were within an ace of coming to blows with the islanders of the Louisiades, and on one occasion a portly member of the gun-room, being cut off by these black gentry, only saved his life by parting with all his clothes as presents to them, and keeping them amused by an impromptu dance in a state of nature under the broiling sun, until a party came to his relief. At Cape

York also, a white woman was rescued who had been made prisoner by the blacks from a wreck, and had lived among them for several years. Here, too, Huxley and MacGillivray made a trip inland, and were welcomed by a native chief, who saw in the former the returning spirit of his dead brother.

Throughout the voyage Huxley was busy with his pencil, and many lithographs from his drawings illustrate the account of the voyage afterwards published. As to his scientific work, he was accumulating a large stock of observations, but felt rather sore about the papers which he had already sent home, for no word had reached him as to their fate, not even that they had been received or looked over by Forbes, to whom they had been consigned. As a matter of fact, they had not been neglected, as he was to find out on his return; but meanwhile the state of affairs was not reassuring to a man whose dearest hopes were bound up in the reception he could win for these and similar researches. Altogether, it was with no little joy that he turned his back on the sweltering heat of Torres Straits, on the great mountains of New Guinea, the Owen Stanley range, which had remained hidden from D'Urville in the *Astrolabe* to be discovered by the explorers on the *Rattlesnake*, and the far stretching archipelago of the Louisiades, one tiny island in which still bears the name of Huxley, after the assistant-surgeon of the *Rattlesnake*.

A few extracts from letters of the time will give a more vivid idea of what the voyage was like. The first is from a letter to his mother, dated February 1, 1849:—

. . . I suppose you have wondered at the long intervals of my letters, but my silence has been forced. I wrote from Rockingham Bay in May, and from Cape York in October. After leaving the latter place we have had no communication with any one but the folks at Port Essington, which is a mere military post, without any certain means of communication with England. We were ten weeks on our passage from Port Essington to Sydney and touched nowhere, so that you may imagine we were pretty well tired of the sea by the time we reached Port Jackson.

Thank God we are now safely anchored in our old quarters, and for the next three months shall enjoy a few of those comforts that make life worth the living. . . .

The only place we have visited since my last budget to you was Port Essington, a military post which has been an object of much attention for some time past in connection with the steam navigation between Sydney and India. It is about the most useless, miserable, ill-managed hole in Her Majesty's dominions. Placed fifteen miles inland on the swampy banks of an estuary out of reach of the sea breezes, it is the most insufferably hot and enervating place imaginable. The temperature of the water alongside the ship was from 88 to 90, *i.e.* about that of a moderately warm bath, so that you may fancy what it is on land. Added to this, the commandant is a litigious old fool, always at war with his officers, and endeavouring to make the place as much of a hell morally as it is physically. Little more than two years ago a detachment of sixty men came out to the settlement. At the parade on the Sunday I was there; there were just ten men present. The rest were invalided, dead, or sick. I have no hesitation in saying that half of this was the result of ill-management. The climate in itself is not particularly unhealthy. We were all glad to get away from the place.

Another is to his sister, under date Sydney, March 14, 1849:—

By the way, I may as well give you a short account of our cruise. We started from here last May to survey what is called the inner passage to India. You must know that the east coast of Australia has running parallel to it at distances of from five miles to seventy or eighty an almost continuous line of coral reefs, the Great Barrier as it is called. Outside this line is the great Pacific, inside is a space varying in width as above, and cut up by little islands and detached reefs. Now to get to India from Sydney, ships must go either inside or outside the Great Barrier. The inside passage has been called the Inner Route in consequence of its desirability for steamers, and our business has been to mark out this Inner Route safely and clearly among the labyrinth-like islands and reefs within the Barrier. And a parlous dull business it was for those who, like myself, had no necessary and constant occupation. Fancy for five mortal months shifting from patch to patch of white sand in latitude

from 17 to 10 south, living on salt pork and beef, and seeing no mortal face but our own sweet countenances considerably obscured by the long beard and moustaches with which, partly from laziness and partly from comfort, we had become adorned. I cultivated a peak in Charles I. style, which imparted a remarkably peculiar and *triste* expression to my sunburnt phiz, heightened by the fact that the aforesaid beard was, I regret to say it, of a very questionable auburn—my messmates called it red.

We convoyed a land expedition as far as the Rockingham Bay in 17 south under a Mr. Kennedy, which was to work its way up to Cape York in 11 south and there meet us. A fine noble fellow poor Kennedy was too. I was a good deal with him at Rockingham Bay, and indeed accompanied him in the exploring trips which he made for some four or five days in order to see how the land lay about him. In fact we got on so well together that he wanted me much to accompany him and join the ship again at Cape York, and if the Service would have permitted of my absence I should certainly have done so. But it was well I did not. Out of thirteen men composing the party but three remain alive. The rest have perished by starvation or the spears of the natives. Poor Kennedy himself had, in company with the black fellow attached to the party, by dint of incredible exertions, pushed on until he came within sight of the provision vessel waiting his arrival at Cape York. But here, within grasp of his object, a large party of natives attacked and killed him. The black fellow alone reached Cape York with the news. The other two men who were saved were the sole survivors of the party Kennedy left behind him at a spot near the coast, and were picked up by the provision vessel when she returned.

You may be sure I am not sorry to return home. I say home advisedly, for my friend Fanning's house is as completely my home as it well can be. And then Nettie had not heard anything of me for six months, so that I have been petted and spoiled ever since we came in. . . . As I tell her I fear she has rested her happiness on a very insecure foundation; but she is full of hope and confidence, and to me her love is the faith that moveth mountains. We have, as you may be sure, a thousand difficulties in our way, but like Danton I take for my motto, "De l'audace et encore de l'audace et toujours de l'audace," and look forward to a happy termination, nothing doubting.

## TO HIS MOTHER

(Announcing the probable time of his return).

SYDNEY, *Feb.* 11, 1850.

I cannot at all realise the idea of our return. We have been leading such a semi-savage life for years past, such a wandering nomadic existence, that any other seems in a manner unnatural to me. Time was when I should have looked upon our return with unmixed joy; but so many new and strong ties have arisen to unite me with Sydney, that now when the anchor is getting up for England, I scarcely know whether to rejoice or to grieve. You must not be angry, my dear Mother; I have none the less affection for you or any other of those whom I love in England—only a very great deal for a certain little lassie whom I must leave behind me without clearly seeing when we are to meet again. You must remember the Scripture as my excuse, “A man shall leave his father and mother and cleave unto his” (I wish I could add) wife. Our long cruises are fine times for reflection, and during the last I determined that we would be terribly prudent and get married about 1870, or the Greek Kalends, or, what is about the same thing, whenever I am afflicted with the *malheur de richesses*.

People talk about the satisfaction of an approving conscience. Mine approves me intensely; but I'll be hanged if I see the satisfaction of it. I feel much more inclined to swear “worse than our armies in Flanders.” . . . So far as my private doings are concerned, I hear very satisfactory news of them. I heard from an old messmate of mine at Haslar the other day that Dr. MacWilliam, F.R.S., one of our deputy-inspectors, had been talking about one of my papers, and gave him to understand that it was to be printed. Furthermore, he is a great advocate for the claims of assistant surgeons to ward-room rank, and all that sort of stuff, and, I am told, quoted me as an example! Henceforward I look upon the learned doctor as a man of sound sense and discrimination! Without joking, however, I am glad to have come under his notice, as he may be of essential use to me. I find myself getting horribly selfish, looking at everything with regard to the influence it may have on my grand objects.

Further descriptions of the voyage are to be drawn from an article in the *Westminster Review* for January 1854

(vol. v.), in which, under the title of "Science at Sea," Huxley reviewed the *Voyage of the Rattlesnake* by MacGillivray, the naturalist to the expedition, which had recently appeared. This book gave very few descriptions of the incidents and life on board, and so drew in many ways a colourless picture of the expedition. This defect the reviewer sought to remedy by giving extracts from the so-called "unpublished correspondence" of one of the officers—sketches apparently written for the occasion—as well as from an equally unpublished but more real journal kept by the same hand.

The description of the ship herself, of her inadequate equipment for the special purposes she was to carry out, of the officers' quiet contempt of scientific pursuits, which not even the captain's influence was able to subdue, of the illusory promises of help and advancement held out by the Admiralty to young investigators, makes a striking foil to the spirit in which the Government of thirty years later undertook a greater scientific expedition. Perhaps some vivid recollections of this voyage did something to better the conditions under which the later investigators worked.

Thus, p. 100:

In the year 1846, Captain Owen Stanley, a young and zealous officer, of good report for his capabilities as a scientific surveyor, was entrusted with the command of the *Rattlesnake*, a vessel of six-and-twenty guns, strong and seaworthy, but one of that class unenviably distinguished in the war-time as a "donkey-frigate." To the laity it would seem that a ship journeying to unknown regions, when the lives of a couple of hundred men may, at any moment, depend upon her handiness in going about, so as to avoid any suddenly discovered danger, should possess the best possible sailing powers. The Admiralty, however, makes its selection upon other principles, and exploring vessels will be invariably found to be the slowest, clumsiest, and in every respect the most inconvenient ships which wear the pennant. In accordance with the rule, such was the *Rattlesnake*; and to carry out the spirit of the authorities more completely, she was turned out of Portsmouth dockyard in such a disgraceful state of unfitness, that her lower deck was continually under water during the voyage.

Again, p. 100:

It is necessary to be provided with books of reference, which are ruinously expensive to a private individual, though a mere dewdrop in the general cost of the fitting out of a ship, especially as they might be kept in store, and returned at the end of a commission, like other stores. A hundred pounds would have well supplied the *Rattlesnake*; but she sailed without a volume, an application made by her captain not having been attended to.

P. 103:

Of all those who were actively engaged upon the survey, the young commander alone was destined by inevitable fate to be robbed of his just reward. Care and anxiety, from the mobility of his temperament, sat not so lightly upon him as they might have done, and this, joined to the physical debility produced by the enervating climate of New Guinea, fairly wore him out, making him prematurely old before much more than half of the allotted span was completed. But he died in harness, the end attained, the work that lay before him honourably done. Which of us may dare to ask for more? He has raised an enduring monument in his works, and his epitaph shall be the grateful thanks of many a mariner threading his way among the mazes of the Coral Sea.

P. 104:

The world enclosed within the timbers of a man-of-war is a most remarkable community, hardly to be rendered vividly intelligible to the mere landsman in these days of constitutional government and freedom of the press.

Then follows a vigorous sketch of sea life from Chamisso, suggesting that the type of one's relation to the captain is to be found in Jean Paul's *Biography of the Twins*, who were united back to back. This sketch Huxley enforces by a passage from the imaginary journal aforesaid, "indited apparently when the chains were yet new and somewhat galled the writer," to judge from which "little alteration would seem to have taken place in nautical life" since Chamisso's voyage, thirty years before.

You tell me (he writes), that you sigh for my life of freedom and adventure; and that, compared with mine, the conventional monotony of your own stinks in your nostrils. My dear fellow,

be patient, and listen to what I have to say; you will then, perhaps, be a little more content with your lot in life, and a little less desirous of mine. Of all extant lives, that on board a ship-of-war is the most artificial—whether necessarily so or not is a question I will not undertake to decide; but the fact is indubitable.

How utterly disgusted you get with one another! Little peculiarities which would give a certain charm and variety to social intercourse under any other circumstances, become sources of absolute pain, and almost uncontrollable irritation, when you are shut up with them day and night. One good friend and messmate of mine has a peculiar laugh, whose iteration on our last cruise nearly drove me insane.

There is no being alone in a ship. Sailors are essentially gregarious animals, and don't at all understand the necessity under which many people labour—I among the rest—of having a little solitary converse with oneself occasionally.

Then, to a landsman fresh from ordinary society and its peculiarly undemonstrative ways, there is something very wonderful about naval discipline. I do not mean to say that the subordination kept up is more than is necessary, nor perhaps is it in reality greater than is to be found in a college, or a regiment, or a large mercantile house; but it is made so *very* obvious. You not only feel the bit, but you see it; and your bridle is hung with bells to tell you of its presence.

Your captain is a very different person, in relation to his officers, from the colonel of a regiment; he is a demi-god, a Dalai lama, living in solitary state; sublime, unapproachable; and the radiation of his dignity stretches through all the other members of the nautical hierarchy; hence all sorts of petty intrigues, disputes, grumblings, and jealousies, which, to the irreverent eye of an "idler," give to the whole little society the aspect of nothing so much as the court of Prinz Irenæus in Kater Murr's inestimable autobiography.

P. 107 *sq.* :

After describing the illusory promises of the Admiralty and their grudging spirit towards the scientific members of the expedition, he continues :—

These are the *facilities and encouragement* to science afforded by the Admiralty; and it cannot be wondered at if the same spirit runs through its subordinate officers.



Not that there is any active opposition—quite the reverse. But it is a curious fact, that if you want a boat for dredging, ten chances to one they are always actually or potentially otherwise disposed of; if you leave your towing-net trailing astern in search of new creatures, in some promising patch of discoloured water, it is, in all probability, found to have a wonderful effect in stopping the ship's way, and is hauled in as soon as your back is turned; or a careful dissection waiting to be drawn may find its way overboard as a "mess."

The singular disrespect with which the majority of naval officers regard everything that lies beyond the sphere of routine, tends to produce a tone of feeling very unfavourable to scientific exertions. How can it be otherwise, in fact, with men who, from the age of thirteen, meet with no influence but that which teaches them that the "Queen's regulations and instructions" are the law and the prophets, and something more?

It may be said, without fear of contradiction, that in time of peace the only vessels which are engaged in services involving any real hardship or danger are those employed upon the various surveys; and yet the men of easy routine—harbour heroes—the officers of *regular* men-of-war, as they delight to be called, pretend to think surveying a kind of shirking—in sea-phrase, "sloping." It is to be regretted that the officers of the surveying vessels themselves are too often imbued with the same spirit; and though, for shame's sake, they can but stand up for hydrography, they are too apt to think an alliance with other branches of science as beneath the dignity of their divinity—the "Service."

P. 112:

Any adventures ashore were mere oases, separated by whole deserts of the most wearisome *ennui*. For weeks, perhaps, those who were not fortunate enough to be living hard and getting fatigued every day in the boats were yawning away their existence in an atmosphere only comparable to that of an orchid-house, a life in view of which that of Mariana in the moated grange has its attractions.

For instance, consider this extract from the journal of one of the officers, date August 1849:—

"Rain! rain! *encore et toujours*—I wonder if it is possible for the mind of man to conceive anything more degradingly offensive than the condition of us 150 men, shut up in this wooden box, and being watered with hot water, as we are now.

It is no exaggeration to say *hot*, for the temperature is that at which people at home commonly take a hot bath. It rains so hard that we have caught seven tons of water in one day, and it is therefore impossible to go on deck, though, if one did, one's condition would not be much improved. A *hot* Scotch mist covers the sea and hides the land, so that no surveying can be done; moving about in the slightest degree causes a flood of perspiration to pour out; all energy is completely gone, and if I could help it I would not think even; it's too hot. The rain awnings are spread, and we can have no wind sails up; if we could, there is not a breath of wind to fill them; and consequently the lower and main decks are utterly unventilated: a sort of solution of man in steam fills them from end to end, and surrounds the lights with a lurid halo. It's too hot to sleep, and my sole amusement consists in watching the cockroaches, which are in a state of intense excitement and happiness. They manifest these feelings in a very remarkable manner—a sudden unanimous impulse seems to seize the obscene thousands which usually lurk hidden in the corners of my cabin. Out they rush, helter-skelter, and run over me, my table, and my desk; others, more vigorous, fly, quite regardless of consequences, until they hit against something, upon which, half spreading their wings, they make their heads a pivot and spin round in a circle, in a manner which indicates a temporary aberration of the cockroach mind. It is these outbreaks alone which rouse us from our lassitude. Knocks are heard resounding on all sides, and each inhabitant of a cabin, armed with a slipper, is seen taking ample revenge upon the disturbers of his rest and the destroyers of his body and clothes."

Here, on the other hand, is an oasis, a bartering scene at Bruny Island, in the Louisiade:—

"We landed at the same place as before, and this time the natives ran down prancing and gesticulating. Many of them had garlands of green leaves round their heads, knees, and ankles; some wore long streamers depending from their arms and ears and floating in the wind as they galloped along, shaking their spears and prancing just as boys do when playing at horses. They soon surrounded us, shouting 'Kelumai! Kelumai!' (their word for iron), and offering us all sorts of things in exchange. One very fine athletic man, 'Kai-oo-why-who-at' by name, was perfectly mad to get an axe, and very soon comprehended the arrangements that were made. Mr. Brady drew ten lines on the sand and laid an axe down by them,

giving K— (I really can't write that long name all over again) to understand by signs that when there was a 'bahar' (yam) on every mark he should have the axe. He comprehended directly, and bolted off as fast as he could run, soon returning with his hands full of yams, which he deposited one by one on the appropriate lines; then fearful lest some of the others should do him out of the axe, he caught hold of Brady by the arm, and would not let him go until yams enough had been brought by the others to make up the number, and the axe was handed over to him.

"Then was there a yell of delight! He jumped up with the axe, flourished it, passed it to his companions, tumbled down and rolled over, kicking up his heels in the air, and finally, catching hold of me, we had a grand waltz, with various *poses plastiques*, for about a quarter of a mile. I daresay he was unsophisticated enough to imagine that I was filled with sympathetic joy, but I grieve to say that I was taking care all the while to direct his steps towards the village, which, as we had as yet examined none of their houses, I was most desirous of entering under my friend's sanction. I think he suspected something, for he looked at me rather dubiously when I directed our steps towards the entrance in the bush which led to the houses, and wanted me to go back; but I was urgent, so he gave way, and we both entered the open space, where we were joined by two or three others, and sat down under a cocoa-nut tree.

"I persuaded him to sit for his portrait (taking care first that my back was against the tree and my pistols handy), and we ate green cocoanuts together, at last attaining to so great a pitch of intimacy that he made me change names with him, calling himself 'Tamoo' (my Cape York name), and giving me to understand that I was to take his own lengthy appellation. When I did so, and talked to him as 'Tamoo,' nothing could exceed the delight of all around; they patted me as you would a child, and evidently said to one another, 'This really seems to be a very intelligent white fellow.'

"Like the Cape York natives, they were immensely curious to look at one's legs, asking permission, very gently but very pressingly, to pull up the trouser, spanning the calf with their hands, drawing in their breath and making big eyes all the while. Once, when the front of my shirt blew open, and they saw the white skin of my chest, they set up an universal shout. I imagine that as they paint *their* faces black, they fancied that

we ingeniously coloured ours white, and were astonished to see that we were really of that (to them) disgusting tint all over."

On May 2, 1850, the *Rattlesnake* sailed for the last time out of Sydney harbour, bound for England by way of the Horn. In spite of his cheerful anticipations, Huxley was not to see his future wife again for five years more, when he was at length in a position to bid her come and join him. During the three years of their engagement in Australia, they had at least been able to see each other at intervals, and to be together for months at a time. In the long periods of absence, also, they had invented a device to cheat the sense of separation. Each kept a particular journal, to be exchanged when they met again, and only to be read, day by day, during the next voyage. But now it was very different, their only means of communication being the slow agency of the post, beset with endless possibilities of misunderstanding when it brought belated answers to questions already months old and out of date in the changed aspect of circumstances. These perils, however, they weathered, and it proves how deep in the moral nature of each the bond between them was rooted, that in the end they passed safely through the still greater danger of imperceptibly growing estranged from one another under the influences of such utterly different surroundings.

A kindly storm which forced the old ship to put into the Bay of Islands to repair a number of small leaks that rendered the lower deck uninhabitable, made it possible for Huxley to send back a letter that should reach Australia in one month instead of ten after his departure.

He utilized a week's stay here characteristically enough in an expedition to Waimate, the chief missionary station and the school of the native institutions (a sort of Normal School for native teachers), in order to judge of his own inspection what missionary life was like.

I have been greatly surprised in these good people (he writes). I had expected a good deal of *straight-hairedness* (if you understand the phrase) and methodistical puritanism, but I find it quite otherwise. Both Mr. and Mrs. Burrows seem

very quiet and unpretending—straightforward folks desirous of doing their best for the people among whom they are placed.

One touch must not be allowed to pass unnoticed in his appreciation of the missionaries' unstudied welcome to the belated travellers, whose proper host was unable to take them in:—"tea unlimited and a blazing fire, *together with a very nice cat.*"

By July 12, midwinter of course in the southern hemisphere, they had rounded the Horn, and Huxley writes from that most desolate of British possessions, the Falkland Islands:—

I have great hopes of being able to send a letter to you, *via* California, even from this remote corner of the world. It is the Ultima Thule and no mistake. Fancy two good-sized islands with undulated surface and sometimes elevated hills, but without tree or bush as tall as a man. When we arrived the 8th inst. the barren uniformity was rendered still more obvious by the deep coating of snow which enveloped everything. How can I describe to you "Stanley," the sole town, metropolis, and seat of government? It consists of a lot of black, low, weather-board houses scattered along the hillsides which rise round the harbour. One barnlike place is Government House, another the pensioners' barracks, rendered imposing by four field-pieces in front; others smaller are the residences of the colonel, surgeon, etc. In one particularly black and unpromising-looking house lives a Mrs. Sullivan (*sic*) the wife of Captain Sullivan,\* who surveyed these islands, and has settled out here. I asked myself if I could have had the heart to bring you to such a desolate place, and myself said "No." However, I believe she is very happy with her children. Sullivan is a fine energetic man, so I suppose if she loves him, well and good, and fancies (is she not a silly woman?) that she has her reward. Mrs. Stanley has gone to stay with them while the ship remains here, and I

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\* Captain Sullivan, who sailed with Darwin in the *Beagle*, and served with great distinction in command of the southern division of the fleet in the battle of Obligado (Plate River), had surveyed the Falkland Islands many years before his temporary settlement there. During the Crimean War he was surveying officer to the Baltic fleet, and afterwards naval adviser to the Board of Trade. He was afterwards Admiral and K.C.B.

think I shall go and look them up under pretence of making a call. They say that the present winter is far more savage than the generality of Falkland Island winters, and it had need be, for I never felt anything so bitterly cold in my life. The thermometer has been down below 22, and shallow parts of the harbour even have frozen. Nothing to be done ashore. My rifle lies idle in its case; no chance of a shot at a bull, and one has to go away 20 miles to get hold even of the upland geese and rabbits. The only thing to be done is to eat, eat, eat, and the cold assists one wonderfully in that operation. You consume a pound or so of beefsteaks at breakfast and then walk the deck for an appetite at dinner, when you take another pound or two of beef or a goose, or some such trifle. By four o'clock it is dark night, and as it is too cold to read the only thing to be done is to vanish under blankets as soon as possible and take twelve or fourteen hours' sleep.

Mrs. Stanley's Bougirigards,\* which I have taken under my care during the cold weather, admire this sort of thing exceedingly and thrive under it, so I suppose I ought to.

The journey from New Zealand here has been upon the whole favourable; no gales—quite the reverse—but light variable winds and calms. The latter part of our voyage has, however, been very cold, snow falling in abundance, and the ice forming great stalactites about our bows. We have seen no icebergs nor anything remarkable. From all I can learn it is most probable that we shall leave in about a week and shall go direct to England without stopping at any other port. I wish it may be so. I want to get home and look about me.

We have had news up to the end of March. There is nothing of any importance going on. By the Navy list for April I see that I shall be as nearly as possible in the middle of those of my own rank, *i.e.* I shall have about 150 above and as many below me. This is about what I ought to expect in the ordinary run of promotion in eight years, and I have served four and a half of that time. I don't expect much in the way of promotion, especially in these economic times; but I do not fear that I shall be able to keep me in England for at least a year after our arrival, in order to publish my papers. The Admiralty have quite recently published a distinct declaration that they will consider scientific attainments as a claim to their notice, and I expect to be the first to remind them of their promise, and

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\* The Australian love-bird; a small parrakeet.

I will take care to have the reminder so backed that they must and shall take note of it. Even if they will not promote me at once, it would answer our purpose to have an appointment to some ship on the home station for a short time.

The last of the Falklands was seen on July 25; the line was crossed in thirty-six days; another month, and water running short, it was found necessary to put in at the Azores for a week. Leaving Fayal on October 5, the *Rattlesnake* reached Plymouth on the 23rd, but next day proceeded to Chatham, which, thanks to baffling winds, was not reached till November 9, when the ship was paid off.

## CHAPTER V

1850-1851

IN the Huxley Lecture for 1898 (*Times*, October 4) Professor Virchow takes occasion to speak of the effect of Huxley's service in the *Rattlesnake* upon his intellectual development:—

When Huxley himself left Charing Cross Hospital in 1846, he had enjoyed a rich measure of instruction in anatomy and physiology. Thus trained, he took the post of naval surgeon, and by the time that he returned, four years later, he had become a perfect zoologist and a keen-sighted ethnologist. How this was possible any one will readily understand who knows from his own experience how great the value of personal observation is for the development of independent and unprejudiced thought. For a young man who, besides collecting a rich treasure of positive knowledge, has practised dissection and the exercise of a critical judgment, a long sea-voyage and a peaceful sojourn among entirely new surroundings afford an invaluable opportunity for original work and deep reflection. Freed from the formalism of the schools, thrown upon the use of his own intellect, compelled to test each single object as regards properties and history, he soon forgets the dogmas of the prevailing system and becomes, first a sceptic, and then an investigator. This change, which did not fail to affect Huxley, and through which arose that Huxley whom we commemorate to-day, is no unknown occurrence to one who is acquainted with the history, not only of knowledge, but also of scholars.

But he was not destined to find his subsequent path easy. Once in England, indeed, he did not lose any time. No sooner had the *Rattlesnake* touched at Plymouth than



Commander Yule, who had succeeded Captain Stanley in the command of the ship, wrote to the head of the Naval Medical Department stating the circumstances under which Huxley's zoological investigations had been undertaken, and asking the sanction of the Admiralty for their publication. The hydrographer, in sending the formal permission, says :—

But I have to add that their Lordships will not allow any charge to be made upon the public funds towards the expense. You will, however, further assure Mr. Huxley that any assistance that can be supplied from this office shall be most cheerfully given to him, and that I heartily hope, from the capacity and taste for scientific investigation for which you give him credit, that he will produce a work alike creditable to himself, to his late Captain, by whom he was selected for it, and to Her Majesty's service.

Personally, the hydrographer took a great interest in science; but as for the department, Huxley somewhat bitterly interpreted the official meaning of this well-sounding flourish to be made: "Publish if you can, and give us credit for granting every facility except the one means of publishing."

Happily there was another way of publishing, if the Admiralty would grant him time to arrange his papers and superintend their publication. The Royal Society had at their disposal an annual grant of money for the publication of scientific works. If the Government would not contribute directly to publish the researches made under their auspices, the favourable reception which his preliminary papers had met with led Huxley to hope that his greater work would be undertaken by the Royal Society. If the leading men of science attested the value of his work, the Admiralty might be induced to let him stay in England with the nominal appointment as assistant surgeon to H.M.S. *Fisguard* at Woolwich, for "particular service," but with leave of absence from the ship so that he could live and pursue his avocations in London. There was a precedent for this course in the case of Dr. Hooker, when he had to work out the scientific results of the voyage of the *Ercbus* and *Terror*.

In this design he was fortified by his old Haslar friend, Dr. (afterwards Sir John) Watt Reid, who wrote: "They cannot, and, I am sure, will not wish to stand in your way at Whitehall." Meanwhile, the first person, naturally, he had thought of consulting was his old chief, Sir John Richardson, who had great weight at the Admiralty, and to him he wrote the following letter before leaving Plymouth.

### TO SIR JOHN RICHARDSON

*Oct. 31, 1850.*

I regret very much that in consequence of our being ordered to be paid off at Chatham, instead of Portsmouth, as we always hoped and expected, I shall be unable to submit to your inspection the zoological notes and drawings which I have made during our cruise. They are somewhat numerous (over 180 sheets of drawings), and I hope not altogether valueless, since they have been made with as great care and attention as I am master of—and with a microscope, such as has rarely, if ever, made a voyage round the world before. A further reason for indulging in this hope consists in the fact that they relate for the most part to animals hitherto very little known, whether from their rarity or from their perishable nature, and that they bear upon many curious physiological points.

I may thus classify and enumerate the observations I have made—

1. Upon the organs of hearing and circulation in some of the transparent Crustacea, and upon the structure of certain of the lower forms of Crustacea.

2. Upon some very remarkable new forms of Annelids, and especially upon the much contested genus *Sagitta*, which I have evidence to show is neither a Mollusc nor an Epizoon, but an Annelid.

3. Upon the nervous system of certain Mollusca hitherto imperfectly described—upon what appears to me to be an urinary organ in many of them—and upon the structure of *Firola* and *Atlanta*, of which latter I have a pretty complete account.

4. Upon two perfectly new (ordinally new) species of Ascidians.

5. Upon *Pyrosoma* and *Salpa*. The former has never been described (I think) since Savigny's time, and he had only specimens preserved in spirits. I have a great deal to add and alter.

Then as to *Salpa*, whose mode of generation has always been so great a bone of contention, I have a long series of observations and drawings which I have verified over and over again, and which, if correct, must give rise to quite a new view of the matter. I may mention as an interesting fact that in these animals so low in the scale I have found a *placental circulation*, rudimentary indeed, but nevertheless a perfect model on a small scale of that which takes place in the mammalia.

6. I have the materials for a monograph upon the *Acalephæ* and *Hydrostatic Acalephæ*. I have examined very carefully more than forty genera of these animals—many of them very rare, and some quite new. But I paid comparatively little attention to the collection of new species, caring rather to come to some clear and definite idea as to the structure of those which had indeed been long known, but very little understood. Unfortunately for science, but fortunately for me, this method appears to have been somewhat novel with observers of these animals, and consequently everywhere new and remarkable facts were to be had for the picking up.

It is not to be supposed that one could occupy one's self with the animals for so long without coming to some conclusion as to their systematic place, however subsidiary to observation such considerations must always be regarded, and it seems to me (although on such matters I can of course only speak with the greatest hesitation) that just as the more minute and careful observations made upon the old "Vermes" of Linnæus necessitated the breaking up of that class into several very distinct classes, so more careful investigation requires the breaking up of Cuvier's "Radiata" (which succeeded the "Vermes" as a sort of zoological lumber-room) into several very distinct and well-defined new classes, of which the *Acalephæ*, *Hydrostatic Acalephæ*, actinoid and hydroid polypes, will form one. But I fear that I am trespassing beyond the limits of a letter. I have only wished to state what I have done in order that you may judge concerning the propriety or impropriety of what I propose to do. And I trust that you will not think that I am presuming too much upon your kindness if I take the liberty of thus asking your advice about my own affairs. In truth, I feel in a manner responsible to you for the use of the appointment you procured for me; and furthermore, Capt. Stanley's unfortunate decease has left the interests of the ship in general and my own in particular without a representative.

Can you inform me, then, what chance I should have either

(1) of procuring a grant for the publication of my papers, or (2) should that not be feasible, to obtain a nominal appointment (say to the *Fisguard* at Woolwich, as in Dr. Hooker's case) for such time as might be requisite for the publication of my papers and drawings in some other way?

I shall see Professors Owen and Forbes when I reach London, and I have a letter of introduction to Sir John Herschel (who has, I hear, a great penchant for the towing-net). Supposing I could do so, would it be of any use to procure recommendations from them that my papers should be published?

[(Half-erased) To Sir F. Beaufort also I have a letter.] Would it not be proper also to write to Sir W. Burnett acquainting him with my views, and requesting his acquiescence and assistance?

Begging an answer at your earliest convenience, addressed either to the *Rattlesnake* or to my brother, I remain, your obedient servant,

T. H. HUXLEY.

41 North Bank.

He received a most friendly reply from "Old John." He was willing to do all in his power to help, but could recommend Government aid better if he had seen the drawings. Meantime a certificate should be got from Forbes, the best man in this particular branch of science, backed, if possible, by Owen. He would speak to some officials himself, and give Huxley introductions to others, and if he could get up to town, would try to see the collections and add his name to the certificate.

Both Forbes and Owen were ready to help. The former wrote a most encouraging letter, singling out the characteristics which gave a peculiar value to these papers:—

I have had very great pleasure in examining your drawings of animals observed during the voyage of the *Rattlesnake*, and have also fully availed myself of the opportunity of going over the collections made during the course of the survey upon which you have been engaged. I can say without exaggeration that more important or more complete zoological researches have never been conducted during any voyage of discovery in the southern hemisphere. The course you have taken of directing your attention mainly to impreservable creatures, and to those orders of the animal kingdom respecting which we have least

information, and the care and skill with which you have conducted elaborate dissections and microscopic examinations of the curious creatures you were so fortunate as to meet with, necessarily gives a peculiar and unique character to your researches, since thereby they fill up gaps in our knowledge of the animal kingdom. This is the more important, since such researches have been almost always neglected during voyages of discovery. The value of some of your notes was publicly acknowledged during your absence, when your memoir on the structure of the Medusae, communicated to the Royal Society, was singled out for publication in the *Philosophical Transactions*. It would be a very great loss to science if the mass of new matter and fresh observation which you have accumulated were not to be worked out and fully published, as well as an injustice to the merits of the expedition in which you have served.

The latter offered to write to the Admiralty on his behalf, giving the weight of his name to the suggestion that the work to be done would take at least twelve months, and that therefore his appointment to the *Fisguard* should not be limited to any less period. "They might be disposed," wrote Huxley to him, "to cut anything I request down—on principle." Moreover, Owen, Forbes, Bell, and Sharpey, all members of the Committee of Recommendation of the Royal Society, had expressed themselves so favourably to his views that in his application he was able to relieve the economic scruples of the Admiralty by telling them that he had a means of publishing his papers through the Royal Society.

The result of his application, thus backed, was that he obtained his appointment on November 29. It was for six months, subject to extension if he were able to report satisfactory progress with his work.

A long letter to his sister, now settled in Tennessee, gives a good idea of his aims and hopes at this time.

41 NORTH BANK, REGENT'S PARK,  
Nov. 21, 1850.

MY DEAREST LIZZIE—We have been at home now nearly three weeks, and I have been a free man again twelve days. Her Majesty's ships have been paid off on the 9th of this month.

Properly speaking, indeed, we have been at home longer, for we touched at Plymouth and trod English ground and saw English green fields on the 23rd of October, but we were allowed to remain only twenty-four hours, and to my great disgust were ordered round to Chatham to be paid off. The ill-luck which had made our voyage homeward so long (we sailed from Sydney on the 2nd of May) pursued us in the Channel, and we did not reach Chatham until the 2nd of November; and what do you think was one of the first things I did when we reached Plymouth? Wrote to Eliza K. asking news of a certain naughty sister of mine, from whom I had never heard a word since we had been away—and if perchance there should be any letter, begging her to forward it immediately to Chatham. And so, when at length we got there, I found your kind long letter had been in England some six or seven months; but hearing of the likelihood of our return, they had very judiciously not sent it to me.

Your letter, my poor Lizzie, justifies many a heartache I have had when thinking over your lot, knowing, as I well do, what emigrant life is in climates less trying than that in which you live. I have seen a good deal of bush life in Australia, and it enables me fully to sympathise with and enter into every particular you tell me—from the baking and boiling and pigs squealing, down to that ferocious landshark Mrs. Gunther, of whose class Australia will furnish fine specimens. Had I been at home, too, I could have enlightened the good folks as to the means of carriage in the colonies, and could have told them that the two or twenty thousand miles over sea is the smallest part of the difficulty and expense of getting anything to people living inland; as it is, I think I have done some good in the matter; their meaning was good but their discretion small. But the obtuseness of English in general about anything out of the immediate circle of their own experience is something wonderful.

I had heard here and there fractional accounts of your doings from Eliza K. and my mother—not of the most cheery description—and therefore I was right glad to get your letter, which, though it tells of sorrow and misfortune enough and to spare, yet shows me that the brave woman's heart you always had, my dearest Lizzie, is still yours, and that you have always had the warm love of those immediately around you, and now, as the doctor's letter tells us, you have one more source of joy and happiness, and this new joy must efface the bitterness—

I do not say the memory, knowing how impossible that would be—of your great loss.\* God knows, my dear sister, I could feel for you. It was as if I could see again a shadow of the great sorrow that fell upon us all years ago.

Nothing can bind me more closely to your children than I am already, but if the christening be not all over you must let me be godfather; and though I fear I am too much of a heretic to promise to bring him up a good son of the church—yet should ever the position which you prophesy, and of which I have an “Ahnung” (though I don’t tell that to anybody but Nettie), be mine, he shall (if you will trust him to me) be cared for as few sons are. As things stand, I am talking half nonsense, but I mean it—and you know of old, for good and for evil, my tenacity of purpose.

Now, as to my own affairs—I am not married. Prudently, at any rate, but whether wisely or foolishly I am not quite sure yet, Nettie and I resolved to have nothing to do with matrimony for the present. In truth, though our marriage was my great wish on many accounts, yet I feared to bring upon her the consequences that might have occurred had anything happened to me within the next few years. We had a sad parting enough, and as is usually the case with me, time, instead of alleviating, renders more disagreeable our separation. I have a woman’s element in me. I hate the incessant struggle and toil to cut one another’s throat among us men, and I long to be able to meet with some one in whom I can place implicit confidence, whose judgment I can respect, and yet who will not laugh at my most foolish weaknesses, and in whose love I can forget all care. All these conditions I have fulfilled in Nettie. With a strong natural intelligence, and knowledge enough to understand and sympathise with my aims, with firmness of a man, when necessary, she combines the gentleness of a very woman and the honest simplicity of a child, and then she loves me well, as well as I love her, and you know I love but few—in the real meaning of the word, perhaps, but two—she and you. And now she is away, and you are away. The worst of it is I have no ambition, except as means to an end, and that end is the possession of a sufficient income to marry upon. I assure you I would not give two straws for all the honours and titles in the world. A worker I must always be—it is my nature—but if I had £400 a year I would never let my name appear to anything I did or shall ever

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\* The death of her little daughter Jessie.

do. It would be glorious to be a voice working in secret and free from all those personal motives that have actuated the best. But, unfortunately, one is not a "vox et præterea nihil," but with a considerable corporality attached which requires feeding, and so while my inner man is continually indulging in these anchorite reflections, the outer is sedulously elbowing and pushing as if he dreamed of nothing but gold medals and professors' caps.

I am getting on very well—better I fear than I deserve. One of my papers was published in 1849 in the *Philosophical Transactions*, another in the *Zoological Transactions*, and some more may be published in the *Linnean* if I like—but I think I shall not like. Then I have worked pretty hard, and brought home a considerable amount of drawings and notes about new or rare animals, all particularly nasty slimy things, and they will most likely be published as a separate work by the Royal Society.

Owens, Forbes, Bell, and Sharpey (the doctor will tell you of what weight these names are) are all members of the committee which disposes of the money, and are all strongly in favour of my "valuable researches" (cock-a-doodle-doo!!) being published by the Society. From various circumstances I have taken a better position than I could have expected among these grandees, and I find them all immensely civil and ready to help me on, tooth and nail, particularly Prof. Forbes, who is a right good fellow, and has taken a great deal of trouble on my behalf. Owen volunteered to write to the "First Lord" on my behalf, and did so. Sharpey, when I saw him, reminded me, as he always does, of my great contest with Stocks\* (do you remember throwing the shoe?), and promised me all the assistance in his power. Prof. Bell, who is secretary to the Royal, and has great influence, promised to help me in every way, and asked me to dine with him and meet a lot of nobs. I take all these things quite as a matter of course, but all the while considerably astonished. The other day I dined at the Geological Club and met Lyell, Murchison, de la B[eche] Horner, and a lot more, and last evening I dined with a whole lot of literary and scientific people.

Owen was, in my estimation, great, from the fact of his smoking his cigar and singing his song like a brick.

I tell you all these things to show you clearly how I stand.

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\* See p. 19.



I am under no one's *patronage*, nor do I ever mean to be. I have never asked, and I never will ask, any man for his help from mere motives of friendship. If any man thinks that I am capable of forwarding the great cause in ever so small a way, let him just give me a helping hand and I will thank him, but if not, he is doing both himself and me harm in offering it, and if it should be necessary for me to find public expression to my thoughts on any matter, I have clearly made up my mind to do so, without allowing myself to be influenced by hope of gain or weight of authority.

There are many nice people in this world for whose praise or blame I care not a whistle. I don't know and I don't care whether I shall ever be what is called a great man. I will leave my mark somewhere, and it shall be clear and distinct T. H. H., his mark.

and free from the abominable blur of cant, humbug, and self-seeking which surrounds everything in this present world—that is to say, supposing that I am not already unconsciously tainted myself, a result of which I have a morbid dread. I am perhaps overrating myself. You must put me in mind of my better self, as you did in your last letter, when you write.

But I must come to the close of my epistle, as I have one to enclose from my mother. My next shall be longer, and I hope I shall then be able to tell you what I am doing. At any rate I hope to be in England for twelve months.

I am very much ashamed of myself for not having written to you for so long—open confession is good for the soul, they say, and I will honestly confess that I was half puzzled, half piqued, and altogether sulky at your not having answered my last letter containing my love story, of which I wrote you an account before anybody. You must not suppose my affection was a bit the less because I was half angry. Nettie, who knows you well, could tell you otherwise. Indeed, now that I know all, I consider myself a great brute, and I will give you leave, if you will but write soon, to scold me as much as you like. All the family are well. My father is the only one who is much altered, and that in mind and strength, not in bodily health, which is very good. My mother has lost her front teeth, but is otherwise just the same amusing, nervous, distressingly active old lady she always was.

Our cruisers visit New Orleans sometimes, and if ever I am on the West India station, who knows, I may take a run up to see you all. Kindest love to the children. Tell Florry that I

could not get her the bird with the long tail, but that some day I will send her some pictures of copper-coloured gentlemen with great big wigs and no trousers, and tell her her old uncle loves her very much and never forgets her nor anybody else.

God bless you, dearest Lizzie. Write soon.—Ever your brother,  
TOM.

Thus within a month of landing in England, Huxley had secured his footing in the scientific world. He was freed for the time from the more irksome part of his profession; his service in the navy had become a stepping-stone to the pursuits in which his heart really was. He had long been half in despair over the work which he had sent out like the dove from the ark, if haply it might find him some standing ground in the world; no news of it had reached him till he was about to start on his homeward voyage, but he returned to discover that at a single stroke it had placed him in the front rank of naturalists.

41 NORTH BANK, REGENT'S PARK,

*Jan. 3, 1851.*

My progress (he writes),\* must necessarily be slow and uncertain. I cannot see two steps forwards. Much depends upon myself, much upon circumstances. Hitherto all has gone as well as I could wish. I have gained each object that I had set before myself—that is, I have my shore appointment, I have found a means of publishing what I have done creditably, and I have continued to come into communication with some of the first men in England in my department of science. But, as I have found to be the case in all things that are gained, from money to friendship, it is not so much getting as keeping. It is by no means difficult if you are decently introduced, have tolerably agreeable manners, and some smattering of science, to take a position among these folks, but it is a mighty different affair to keep it and turn it to account. Not like the man who, at the Enchanted Castle, had the courage to blow the horn but not to draw the sword, and was consequently shot forth from the mouth of the cave by which he entered with most ignominious haste,—one must be ready to fight immediately after one's arrival has been announced, or be blown into oblivion.

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\* When not otherwise specified, the extracts in this chapter are from letters to his future wife.

I *have* drawn the sword, but whether I am in truth to beat the giants and deliver my princess from the enchanted castle is yet to be seen.

For several months he lived with his brother George and his wife at North Bank, St. John's Wood (the house was pulled down in 1896 for the Great Central Railway), but the surroundings were too easy, and not conducive to hard work.

I must, I fear, emigrate to some "two pair back," which shall have the feel and manner of a workshop, where I can leave my books about and dissect a marine nastiness if I think fit, sallying forth to meet the world when necessary, and giving it no more time than necessary. If it were not for a fear that P. would take it unkindly I should go at once. I must summon up moral courage somehow (how difficult when it is to pain those we love!) and trust to her good sense for the rest.

And later:—

. . . I have been very busy looking about for the last two days, and have been in fifty houses if I have been in one. I want some place with a decent address, cheap, and beyond all things, clean. The dirty holes that some of these lodgings are! such tawdry finery and such servants, with their faces and hands not merely dirty, but absolutely macadamised. And they all make this confounded great Exhibition a plea for about doubling the rent.

So in April 1851 he removed to lodgings hard by, at 1 Hanover Place, Clarence Gate, Regent's Park ("which sounds grand, but means nothing more than a sitting-room and bedroom in a small house"), then to St. Anne's Gardens, and after that to Upper York Place, while making a second home with his brother. His other great friends already in London were the Fannings, who had left Australia a few months before his own return. In the scientific world he soon made acquaintance with most of the leading men, and began a close friendship with Edward Forbes, with George Busk (then surgeon to H.M.S. *Dreadnought* at Greenwich, afterwards President of the College of Surgeons) and his accomplished wife, and later in the year with both Hooker and Tyndall. The Busks, indeed, showed

him the greatest kindness throughout this period of struggle, and the sympathy and intellectual stimulus he received from their society were of the utmost help. They were always ready to welcome him at Greenwich, and he not only often ran down there for a week-end, but would spend part of his vacations with them at Lowestoft or Tenby, where naturalists could find plenty of occupation.

But from a worldly point of view, it was too soon clear that science was sadly unprofitable. There seemed no speedy prospect of making enough to marry on. As early as March 1851 he writes:—

The difficulties of obtaining a decent position in England in anything like a reasonable time seem to me greater than ever they were. To attempt to live by any scientific pursuit is a farce. Nothing but what is absolutely practical will go down in England. A man of science may earn great distinction, but not bread. He will get invitations to all sorts of dinners and conversaciones, but not enough income to pay his cab fare. A man of science in these times is like an Esau who sells his birth-right for a mess of pottage. Again, if one turns to practice, it is still the old story—wait; and only after years of working like a galley-slave and intriguing like a courtier is there any chance of getting a decent livelihood. I am not at all sure if . . . it would not be the most prudent thing to stick by the Service: there at any rate is certainty in health and in sickness.

Nevertheless he was mightily encouraged in the work of bringing out his *Rattlesnake* papers by a notable success in a quarter where he scarcely dared to hope for it. The Royal Society had for some time set itself to become a body of working men of science; to exclude for the future all mere dilettanti, and to admit a limited number of men whose work was such as to deserve recognition. Thanks to the initiative of Forbes, he now found this recognition accorded to him on the strength of his "Medusa" paper. He writes in February:—

The F.R.S. that you tell me you dream of being appended to my name is nearer than one might think, to my no small surprise. . . . I had no idea that it was at all within my reach, until I found out the other day, talking with Mr. Bell, that my having a paper in the *Transactions* was one of the best of qualifications.

My friend Forbes, to whom I am so much indebted, has taken the matter in hand for me, and I am told I am sure of getting it this year or the next. I do not at all expect it this year, as there are a great many candidates, far better men than I. . . . I shall think myself lucky if I get it next year. Don't say anything about the matter till I tell you. . . . As the old proverb says, there is many a slip 'twixt the cup and the lip.

There were thirty-eight candidates; of these the Council would select fifteen, and submit their names for election at a general meeting of the Society. He was not yet twenty-six years of age, and certainly the youngest and least known of the competitors. Others probably had been up before—possibly many times before; nevertheless, on this, his first candidature, he was placed among the selected. The formal election did not take place till June 5, but on a chance visit to Forbes he heard the great news. The F.R.S. was a formal attestation of the value of the work he had already done; it was a token of success in the present, an augury of greater success in the future. No wonder the news was exciting.

To-day (he writes on April 14) I saw Forbes at the Museum of Practical Geology, where I often drop in on him. "Well," he said, "I am glad to be able to tell you you are all right for the Royal Society; the selection was made on Friday night, and I hear that you are one of the selected. I have not seen the list, but my authority is so good that you may make yourself easy about it." I confess to having felt a little proud, though I believe I spoke and looked as cool as a cucumber. There were thirty-eight candidates, out of whom only fifteen could be selected, and I fear that they have left behind much better men than I. I shall not feel certain about the matter until I receive some official announcement. I almost wish that until then I had heard nothing about it. Notwithstanding all my cucumbery appearance, I will confess to you that I could not sit down and read to-day after the news. I wandered hither and thither restlessly half over London. . . . Whether I have it or not, I can say one thing, that I have left my case to stand on its own strength; I have not asked for a single vote, and there are not on my certificate half the names that there might be. If it be mine, it is by no intrigue.

Again, on May 4:—

I am twenty-six to-day . . . and it reminds me that I have left you now a whole year. It is perfectly frightful to think how the time is slipping by, and yet seems to bring us no nearer.

What have I done with my twenty-sixth year? Six months were spent at sea, and therefore may be considered as so much lost; and six months I have had in England. That, I may say, has not been thrown away altogether without fruit. I have read a good deal and I have written a good deal. I have made some valuable friends, and have found my work more highly estimated than I had ventured to hope. I must tell you something, because it will please you, even if you think me vain for doing so.

I was talking to Professor Owen yesterday, and said that I imagined I had to thank him in great measure for the honour of the F.R.S. "No," he said, "you have nothing to thank but the goodness of your own work." For about ten minutes I felt rather proud of that speech, and shall keep it by me whenever I feel inclined to think myself a fool, and that I have a most mistaken notion of my own capacities. The only use of honours is as an antidote to such fits of the "blue devils." Of one thing, however, which is by no means so agreeable, my opportunities for seeing the scientific world in England force upon me every day a stronger and stronger conviction. It is that there is no chance of living by science. I have been loth to believe it, but it is so. There are not more than four or five offices in London which a Zoologist or Comparative Anatomist can hold and live by. Owen, who has a European reputation, second only to that of Cuvier, gets as Hunterian Professor £300 a year! which is less than the salary of many a bank clerk. My friend Forbes, who is a highly distinguished and a very able man, gets the same from his office of Paleontologist to the Geological Survey of Great Britain. Now, these are first-rate men—men who have been at work for years laboriously toiling upward—men whose abilities, had they turned them into the many channels of money-making, must have made large fortunes. But the beauty of Nature and the pursuit of Truth allured them into a nobler life—and this is the result. . . . In literature a man may write for magazines and reviews, and so support himself; but not so in science. I could get anything I write into any of the journals or any of the Transactions, but I know no means of thereby earning five shillings. A man who chooses a life of science

chooses not a life of poverty, but, so far as I can see, a life of *nothing*, and the art of living upon nothing at all has yet to be discovered. You will naturally think, then, "Why persevere in so hopeless a course?" At present I cannot help myself. For my own credit, for the sake of gratifying those who have hitherto helped me on—nay, for the sake of truth and science itself, I must work out fairly and fully complete what I have begun. And when that is done, I will courageously and cheerfully turn my back upon all my old aspirations. The world is wide, and there is everywhere room for honesty of purpose and earnest endeavour. Had I failed in attaining my wishes from an overweening self-confidence,—had I found that the obstacles after all lay within myself—I should have bitterly despised myself, and, worst of all, I should have felt that you had just ground of complaint.

So far as the acknowledgment of the value of what I have done is concerned, I have succeeded beyond my expectations, and if I have failed on the other side of the question, I cannot blame myself. It is the world's fault and not mine.

A few months more, and he was able to report another and still more unexpected testimony to the value of his work—another encouragement to persevere in the difficult pursuit of a scientific life. He found himself treated as an equal by men of established reputation; and the first-fruits of his work ranked on a level with the maturer efforts of veterans in science. He was within an ace of receiving the Royal Medal, which was awarded him the following year. Of this, he writes:—

*November 7, 1851.*—I have at last tasted what it is to mingle with my fellows—to take my place in that society for which nature has fitted me, and whether the draught has been a poison which has heated my veins or true nectar from the gods, life-giving, I know not, but I can no longer rest where I once could have rested. If I could find within myself that mere personal ambition, the desire of fame, present or posthumous, had anything to do with this restlessness, I would root it out. But in those moments of self-questioning, when one does not lie even to oneself, I feel that I can say it is not so—that the real pleasure, the true sphere, lies in the feeling of self-development—in the sense of power and of growing *oneness* with the great spirit of abstract truth.

Do you understand this? I know you do; our old oneness of feeling will not desert us here. . . .

To-day a most unexpected occurrence came to my knowledge. I must tell you that the Queen places at the disposal of the Royal Society once a year a valuable gold medal to be given to the author of the best paper upon either a physical, chemical, or anatomical or physiological subject. One of these branches of science is chosen by the Royal Society for each year, and therefore for any given subject—say anatomy and physiology; it becomes a triennial prize, and is given to the best memoir in the *Transactions* for three years.

It happens that the Royal Medal, as it is called, is this year given in Anatomy and Physiology. I had no idea that I had the least chance of getting it, and made no effort to do so. But I heard this morning from a member of the Council that the award was made yesterday, and that I was within an ace of getting it. Newport, a man of high standing in the scientific world, and myself were the two between whom the choice rested, and eventually it was given to him, on account of his having a greater bulk of matter in his papers, so evenly did the balance swing. Had I only had the least idea that I should be selected they should have had enough and to spare from me. However, I do not grudge Newport his medal; he is a good and a worthy competitor, old enough to be my father, and has long had a high reputation. Except for its practical value as a means of getting a position I care little enough for the medal. What I do care for is the justification which the being marked in this position gives to the course I have taken. Obstinate and self-willed as I am . . . there are times when grave doubts overshadow my mind, and then such testimony as this restores my self-confidence.

To let you know the full force of what I have been saying, I must tell you that this "Royal Medal" is what such men as Owen and Faraday are glad to get, and is indeed one of the highest honours in England.

To-day I had the great pleasure of meeting my old friend Sir John Richardson (to whom I was mainly indebted for my appointment in the *Rattlesnake*). Since I left England he has married a third wife, and has taken a hand in joining in search of Franklin (which was more dreadful?), like an old hero as he is; but not a feather of him is altered, and he is as grey, as really kind, and as seemingly abrupt and grim, as ever he was. Such a fine old polar bear!



## CHAPTER VI

1851-1854

THE course pursued by the Government in the matter of Huxley's papers is curious and instructive. The Admiralty minute of 1849 had promised either money assistance for publishing or speedy promotion as an encouragement to scientific research in the Navy, especially by the medical officers. On leave to publish the scientific results of the expedition being asked for, the Department forestalled any request for monetary aid by an intimation that none would be given. Strong representations, however, from the leading scientific authorities induced them to grant the appointment to the *Fisguard* for six months.

The sequel shows how the departmental representatives of science did their best for science in Huxley's case, so far as in their power lay:—

May 6, 1851.—The other day I received an intimation that my presence was required at Somerset House. I rather expected the mandate, as six months' leave was up. Sir William was very civil, and told me that the Commander of the *Fisguard* had applied to the Admiralty to know what was to be done with me, as my leave had expired. "Now," said he, "go to Forrest" (his secretary), "write a letter to me, stating what you want, and I will get it done for you." So away I went and applied for an indefinite amount of leave, on condition of reporting the progress of my work every six months, and as I suppose I shall get it, I feel quite easy on that head.

In May 1851 he applied to the Royal Society for help from the Government Grant towards publishing the bulk of his work as a whole, for much of its value would be lost

if scattered fragmentarily among the Transactions of various learned societies. Personally, the members of the committee were very willing to make the grant, but on further consideration it appeared that the money was to be applied for promoting research, not for assisting publication; and moreover, it was desirable not to establish a precedent for saddling the funds at the disposal of the Society with all the publications which it was the clear duty of the Government to undertake. On this ground the application was refused, but at the same time it was resolved that the Government be formally asked to give the necessary subvention towards bringing out these valuable papers.

A similar resolution was passed at the Ipswich meeting of the British Association in July 1851, and at a meeting of its Council in March 1852 the President declared himself ready to carry it into effect by asking the Treasury for the needful £300. But at the July meeting he could only report a *non possumus* answer for the current year (1852) from the Government, and a resolution was passed recommending that application on the subject be renewed by the British Association in the following year.

Meanwhile, weary of official delay, Huxley had conceived the idea of writing direct to the Duke of Northumberland, then First Lord of the Admiralty, whom he knew to take an interest in scientific research. At the same time he stirred Lord Rosse, the President of the Royal Society, to repeat his application to the Treasury. Although the Admiralty in April 1852 again refused money help, and bade him apply to the Royal Society for a portion of the Government Grant (which the latter had already refused him), the Hydrographer was directed to make inquiries as to the propriety of granting him an extension of leave. To his question asking the exact amount of time still required for finishing the work of publication, Huxley returned what he described as a "savage reply," that his experience of engravers led him to think that the plates could be published in eight or nine months from the receipt of a grant; that he had reason to believe this grant might soon be promised, but that the long delay was solely due to the remissness

of those whose duty it was to represent his claims to the Government; and finally, that he must ask for a year's extension of leave.

For these expressions his conscience smote him when, on June 12, at a soirée of the Royal Society, Lord Rosse took him aside and informed him that he had seen Sir C. Trevelyan, the Under Secretary to the Treasury, who said there would be no difficulty in the matter if it were properly laid before the Prime Minister, Lord Derby. To Lord Derby therefore he went, and was told that Mr. Huxley should go to the Treasury and arrange matters in person with Trevelyan. At the same time the indignant tone of his letter to the Hydrographer seemed to have done good; he was invited to explain matters in person, and was granted the leave he asked for.

Everything now seemed to point to a speedy solution of his difficulties. The promise of a grant, of course, did nothing immediate, but assured him a good position, and settled all the scruples of the Admiralty with regard to time. "You have no notion," he writes, "of the trouble the grant has cost me. It died a natural death till I wrote to the Duke in March, and brought it to life again. The more opposition there is, the more determined I am to carry it through." But he was doomed to a worse disappointment than before. Trevelyan received him very civilly, but had heard nothing on the matter from Lord Derby, and accordingly sent him in charge of his private secretary to see Lord Derby's secretary. The latter had seen no papers relating to any such matter, and supposed Lord Derby had not brought them from St. James' Square, "but promised to write to me as soon as anything was learnt. I look upon it as adjourned *sine die*." Parliament breaking up immediately after gave the officials a good excuse for doing nothing more.

When his year's leave expired in June 1853, he wrote the following letter to Sir William Burnett:—

As the period of my leave of absence from H.M.S. *Fisguard* is about to expire, I have the honour to report that the duty on which I have been engaged has been carried out, as far as my

means permit, by the publication of a "Memoir upon the Homologies of the Cephalous Mollusca," with four plates, which appeared in the *Philosophical Transactions* for 1852 (published 1853), being the fourth memoir resulting from the observations made during the voyage of H.M.S. *Rattlesnake* which has appeared in these *Transactions*.

I have the pleasure of being able to add that the President and Council of the Royal Society have considered these memoirs worthy of being rewarded by the Royal Medal in Physiology for 1852, which they did me the honour to confer in the November of that year.

I regret that no definite answer of any kind having as yet been given to the strong representations which were made by the Presidents both of the Royal Society and of the British Association in 1852 to H.M. Government—representations which have recently been earnestly repeated—in order to obtain a grant for the purpose of publishing the remainder of these researches in a separate form, I have been unable to proceed any further, and I beg to request a renewal of my leave of absence from H.M.S. *Fisguard*, so that if H.M. Government think fit to give the grant applied for, it may be in my power to make use of it; or that, should it be denied, I may be enabled to find some other means of preventing the total loss of the labour of some years.

Hereupon he was allowed six months longer, but with the intimation that no further leave would be granted. A final application from the scientific authorities resulted in fresh inquiries as to the length of time still required, and the deadlock between the two departments of State being unchanged, he replied to the same effect as before, but to no purpose. His formal application for leave in January 1854 was met by orders to join the *Illustrious* at Portsmouth. He appealed to the Admiralty that this appointment might be cancelled, giving a brief summary of the facts, and pointing out that it was the inaction of the Treasury which had absolutely prevented him from completing his work.

I would therefore respectfully submit that, under these circumstances, my request to be permitted to remain on half-pay until the completion of the publication of the results of some years' toil is not wholly unreasonable. It is the only reward for which I would ask their Lordships, and indeed, considering the distinct pledge given in the minute to which I have referred,

to grant it would seem as nearly to concern their Lordships' honour as my advantage.

The counter to this bold stroke was crushing, if not convincing. He was ordered to join his ship immediately under pain of being struck off the Navy list. He was of course prepared for this ultimatum, and whether he could manage to pursue science in England or might be compelled to set up as a doctor in Sydney, he considered that he would be better off than as an assistant surgeon in the Navy. Accordingly he stood firm, and the threat was carried into effect in March 1854. An unexpected consequence followed. As long as he was in the navy, with direct claims upon a Government department for assistance in publishing his work, the Royal Society had not felt justified in allotting him any part of the Government Grant. But now that he had left the service, this objection was removed, and in June 1854 the sum of £300 was assigned for this purpose, while the remainder of the expense was borne by the Ray Society, which undertook the publication under the title of *Oceanic Hydrozoa*. Thus he was able to record with some satisfaction how he at last has got the grant, though indirectly, from the Government, and considers it something of a triumph for the principle of the family motto, *tenax propositi*.

While these fruitless negotiations with the Admiralty were in progress, he had done a good deal, both in publishing what he could of his *Rattlesnake* work, and in trying to secure some scientific appointment which would enable him to carry out his two chief objects: the one his marriage, the other the unhampered pursuit of science. In addition to the papers sent home from the cruise—one on the Medusae, published in the *Philosophical Transactions of the Royal Society* for 1849, and one on the Animal of Trigonía, published in the *Proceedings of the Zoological Society* for the same year—he had reported to the Admiralty in June 1851 the publication of seven memoirs:—

1. On the Auditory Organs of the Crustacea. Published in the *Annals of Natural History*.

2. On the Anatomy of the genus *Tethea*. Published in the *Annals of Natural History*.

3. Report upon the Development of the Echinoderms. To appear in the *Annals* for July.

4. On the Anatomy and Physiology of the Salpæ, with four plates. Read at the Royal Society, and to be published in the next part of the *Philosophical Transactions*.

5. On two Genera of Ascidiæ, *Doliolum* and *Appendicularia*, with one plate. Read at the Royal Society, and to be published in the next part of the *Philosophical Transactions*.

6. On some peculiarities in the Circulation of the Mollusca. Sent to M. Milne-Edwards, at his request, to be published in the *Annales des Sciences*.

7. On the Generative Organs of the Physophoridae and Diphyidæ. Sent to Prof. Müller of Berlin for publication in his *Archiv*.

By the end of the year he had four more to report:—  
1. On the Hydrostatic Acalephæ; 2. On the genus *Sagitta*, both published in the *Report of the British Association* for 1851; 3. On *Lacinularia Socialis*, a contribution to the anatomy and physiology of the Rotifera, in the *Transactions of the Microscopical Society*; 4. On *Thalassicolla*, a new zoophyte, in the *Annals of Natural History*. Next year he read before the British Association a paper entitled "Researches into the Structure of the Ascidiæ," and a very important one on the Morphology of the Cephalous Mollusca, afterwards published in the *Philosophical Transactions*. In addition he had prepared a great part of his longer work for publication; out of twenty-four or twenty-five plates, nineteen were ready for the engraver when he wrote his appeal to the Duke of Northumberland. In this same year, 1852, he was also awarded the Royal Medal in Physiology for the value of his contributions to the *Philosophical Transactions*.

In 1853, besides seeing some of these papers through the press, he published one on the existence of Cellulose in the Tunic of Ascidiæ, read before the Microscopical Society, and two papers on the Structure of the Teeth; the latter, of course, like a paper of the previous year on *Echinococcus*, being distinct from the *Rattlesnake* work. The greater work on Oceanic Hydrozoa, over which the battle

of the grant in aid had been waged so long, did not see the light until 1858, when his interest had been diverted from these subjects, and to return to them was more a burden than a pleasure.

In the second place, the years 1851-53, so full of profitless successes in pure science, and delusive hopes held out by the Government, were marked by an equally unsuccessful series of attempts to obtain a professorship. If a chair of Natural History had been established, as he hoped, in the projected university at Sydney, he would gladly have stood for it. Sydney was a second home to him; he would have been backed by the great influence of Macleay; and in his eyes a naturalist could not desire a finer field for his labours than the waters of Port Jackson. But this was not to be, and the first chair he tried for was the newly-instituted chair of Zoology at the University of Toronto. The vacancy was advertised in the summer of 1851; the pay of full £300 a year was enough to marry on; his friends reassured him as to his capacity to fill the post, which, moreover, did not debar him from the hope of returning some day to fill a similar post in England.

I EDWARD STREET, ST. JOHN'S WOOD TERRACE,  
*July 29 [1851].*

MY DEAR HENFREY—I have been detained in town, or I hope we should long since have had our projected excursion.

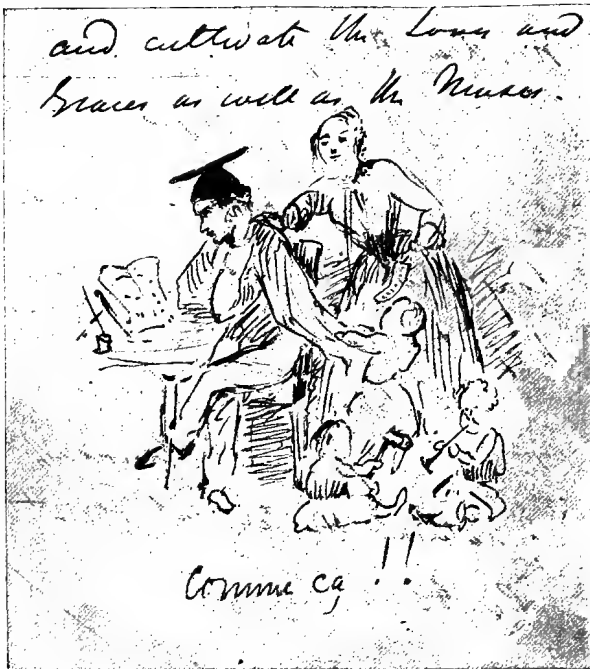
What do you think of my looking out for a Professorship of Natural History at Toronto? Pay £350, with chances of extra fees. I think that out there one might live comfortably upon that sum—possibly even do the domestic and cultivate the Loves and Graces as well as the Muses.

Seriously, however, I should like to know what you think of it. The choice of getting anything over here without devoting one's self wholly to Mammon, seems to me very small. At least it involves years of waiting.

Toronto is not very much out of the way, and the pay is decent and would enable me to devote myself wholly to my favourite pursuits. Were it in England, I could wish nothing better; and, as it is, I think it would answer my purpose very well for some years at any rate.

If they go fairly to work I think I shall have a very good

chance of being elected; but I am told that these matters are often determined by petty intrigues.



Francis\* and I looked for you everywhere at the Botanic Gardens, and finding you were too wise to come, came here, grieving your absence, and had an aesthetic "Bier."

He obtained a remarkably strong set of testimonials from all the leading anatomists and physiologists in the kingdom, as well as one from Milne-Edwards in Paris.

I have put together (he writes) twelve or fourteen testimonials from the first men. I will have no other.

His newly-obtained F.R.S. was a recommendation in itself. So that he writes:—

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\* Dr. William Francis, one of the editors of the *Philosophical Magazine*, and a member of the publishing firm of Taylor and Francis.



There are, I learn, several other candidates, but no one I fear at all, if they only have fair play. There is no one of the others who can command anything like the scientific influence which is being exercised for me, whatever private influence they may have.

What makes all the big-wigs so marvellously zealous on my behalf I know not. I have sought none of them and flattered none of them, that I can say with a good conscience, and I think you know me well enough to believe it. I feel very grateful to them; and if it ever happens that I am able to help a young man on (when I am a big-wig myself!) I shall remember it.

And again, September 23, 1851:—

When I have once sent away my testimonials and done all that is to be done, I shall banish the subject from my mind and make myself quite easy as to results. For the present I confess to being somewhat anxious.

Nevertheless, after many postponements, a near relative of an influential Canadian politician was at length appointed late in 1853. By an amusing coincidence, Huxley's newly-made friend, Tyndall, was likewise a candidate for a chair at Toronto, and likewise rejected. Two letters, concerning Tyndall's election to the Royal Society, contain references both to Toronto and to Sydney.

4 UPPER YORK PLACE, ST. JOHN'S WOOD,  
Dec. 4 [1851].

MY DEAR SIR—I was greatly rejoiced to find I could be of service to you in any way, and I only regret, for your sake, that my name is not a more weighty one. Your election, I should think, can be a matter of no doubt.

As to Toronto, I confess I am not very anxious about it. Sydney would have been far more to my taste, and I confess I envy you what, as I hear, is the very good chance you have of going there.

It used to be our headquarters in the *Rattlesnake* and my home for three months in the year. Should you go, I should be very happy, if you like, to give you letters to some of my friends.

Greatly as I wish we had been destined to do our work together, I cannot but offer the most hearty wishes for your success in Sydney.—Ever yours very faithfully,

John Tyndall, Esq.

THOMAS H. HUXLEY.

41 NORTH BANK, REGENT'S PARK,

May 7, 1852.

MY DEAR TYNDALL—Allow me to be one of the first to have the pleasure of congratulating you on your new honours. I had the satisfaction last night to hear your name read out as one of the selected of the Council of the Royal Society for election to the Fellowship this year, and you are therefore as good as elected.

I always made sure of your success, but I am not the less pleased that it is now a *fait accompli*.—I am, my dear Tyndall, faithfully yours,  
T. H. HUXLEY.

P.S.—I have heard nothing of Toronto, and I begin to think that the whole affair, University and all, is a myth.

His hopes of the Colonies failing, he tried each of the divisions of the United Kingdom in turn, with uniform ill-success; in 1852–53 at Aberdeen and at Cork; in 1853 at King's College, London. He had great hopes of Aberdeen at first; the appointment lay with the Home Secretary, a personal friend of Sir J. Clark, who was interested in Huxley though not personally acquainted with him. But no sooner had he written to urge the latter's claims than a change of ministry took place, and other influences commanded the field. It was cold comfort that Clark told him only to wait—something must turn up. There was still a great probability of the Toronto chair falling to a Cork professor; so with this in view, he gave up a trip to Chamounix with his brother, and attended the meeting of the British Association at Belfast in August 1852, in order to make himself known to the Irish men of science, for, as his friends told him, personal influence went for so much, and while most men's reputations were better than themselves, he might flatter himself that he was better than his reputation. But this, too, came to nothing, and the King's College appointment also went to the candidate who was backed by the most powerful influence.

A fatality seemed to dog his efforts; nevertheless he writes at the end of 1851:—

Among my scientific friends the monition I get on all sides is that of Dante's great ancestor to him—

A te sequi la tua stella.

If this were from personal friends only, I should disregard it; but it comes from men to whose approbation it would be foolish affectation to deny the highest value. I find myself treated on a footing of equality ("my proud self," as you may suppose, would not put up with any other) by men whose names and works have been long before the world. My opinions are treated with a respect altogether unaccountable to me, and what I have done is quoted as having full authority. Without canvassing a soul or making use of any influence, I have been elected into the Royal Society at a time when that election is more difficult than it has ever been in the history of the Society. Without my knowledge I was within an ace of getting the Royal Society medal this year, and if I go on I shall very probably get it next time.

In 1852 he was not only to receive this coveted honour,\* but also to be elected upon the Royal Society Council. In January 1852, when standing for Toronto, he describes how Col. Sabine, then Secretary of the Royal Society, dissuaded him from the project, saying that a brilliant prospect lay before him if he would only wait.

"Make up your mind to get something fairly within your reach, and you will have us all with you." Prof. Owen again offers to do anything in his power for me; Prof. Forbes will move heaven and earth for me if he can; Gray, Bell, and all the leading men are, I know, similarly inclined. Fate says wait, and you shall reach the goal which from a child you have set before yourself. On the other hand, a small voice like conscience speaks of one who is wasting youth and life away for your sake.

Other friends, who, while recognising his general capacities, were not scientific, and had no direct appreciation of his superlative powers in science, thought he was following a course which would never allow him to marry, and urged him to give up his unequal battle with fate, and emigrate to Australia. Of this he writes on August 5, 1852, to Miss Heathorn:—

I must make up my mind to it if nothing turns up. However, I look upon such a life as would await me in Australia with great misgiving. A life spent in a routine employment, |

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\* See pp. III sqq.

with no excitement and no occupation for the higher powers of the intellect, with its great aspirations stifled and all the great problems of existence set hopelessly in the background, offers to me a prospect that would be utterly intolerable but for your love. . . . Sometimes I am half mad with the notion of bringing all my powers in a surer struggle for a livelihood. Sometimes I am equally wild at thinking of the long weary while that has passed since we met. There are times when I cannot bear to think of leaving my present pursuits, when I feel I should be guilty of a piece of cowardly desertion from my duty in doing it, and there come intervals when I would give truth and science and all hopes to be folded in your arms. . . . I know which course is right, but I never know which I may follow; help me . . . for there is only one course in which there is either hope or peace for me.

These repeated disappointments deepened the fits of depression which constantly assailed him. He was torn by two opposing thoughts. Was it just, was it right, to demand so great a sacrifice from the woman who had entrusted her future to the uncertain chances of his fortunes? Could he ask her to go on offering up the best years of her life to aspirations of his which were possibly chimerical, or perhaps merely selfishness in disguise, which ought to yield to more imperative duties? Why not clip the wings of Pegasus, and descend to the sober, everyday jog-trot after plain bread and cheese like other plain people? Time after time he almost made up his mind to throw science to the winds; to emigrate and establish a practice in Sydney; to try even squatting or storekeeping. And yet he knew only too well that with his temperament no life would bring him the remotest approach to lasting happiness and satisfaction except one that gave scope to his intellectual passion. To yield to the immediate pressure of circumstances was perhaps ignoble, was even more probably a surer road to the loss of happiness for himself and for his wife than the repeated and painful sacrifices of the present. With all this, however, and the more when assured of her entire confidence in his judgment, he could not but feel a sense of remorse that she willingly accepted the sacrifice, and feared that she might have done so rather to gratify his

wishes than because reason approved it as the right course to follow.

Here is another typical extract from his correspondence. Hearing that Toronto is likely to go to a relative of a Canadian minister, he writes, January 2, 1852:—

I think of all my dreams and aspirations, and of the path which I know lies before me if I can only bide my time, and it seems a sin and a shameful thing to allow my resolve to be turned; and then comes the mocking suspicion, is this fine abstract duty of yours anything but a subtlety of your own selfishness? Have you not other more imperative duties?

You may fancy whether my life is a very happy one thus spent without even the satisfaction of the sense of right-doing. I must come to some resolution about it, and that shortly. I was talking seriously with Fanning the other night about the possibility of finding some employment of a profitable kind in Australia, storekeeping, squatting, or the like. As I told him, any change in my mode of life must be *total*. If I am to change at all, the change must be total and complete. I will not attempt my own profession. I should only be led astray to think and to work as of old, and sigh continually for my old dear and intoxicating pursuits. I wish I understood Brewing, and I would make a proposition to come and help your father. You may smile, but I am as serious as ever I was in my life.

The distance between them made it doubly difficult to keep in touch with one another, when the post took from four and a half to five or even six months to reach England from Australia. The answer to a letter would come when the matter in question was long done with. The assurance that he was doing right at one moment seemed inadequate when circumstances had altered and hope sunk lower. It was all too easy to suspect that she did not understand his aims, his thirst for action, nor the fact that he was no longer free to do as he liked, whether to stay in the navy, to go into practice, or follow his own pursuits and pleasure. Yet it made him despair to be so hedged in by circumstances. With all his efforts, he seemed as though he had done nothing but earn the reputation of being a very promising young man. How much easier to continue the struggle if he could but have seen her face to face, and

read her thoughts as to whether he were right or wrong in the course he was pursuing. He appeals to her faith that he is choosing the nobler path in pursuing knowledge, than in turning aside to the temptation of throwing it up for the sake of their speedier union. Still she was right in claiming a share in his work; but for her his life would have been wasted.

The clouds gathered very thickly about him when in April 1852 his mother died, while his father was hopelessly ill. "Belief and happiness," he writes, "seem to be beyond the reach of thinking men in these days, but courage and silence are left." Again the clouds lifted, for in October he received Miss Heathorn's "noble and self-sacrificing letter, which has given me more comfort than anything for a long while," the keynote of which was that a man should pursue those things for which he is most fitted, let them be what they will. He now felt free to tell the vicissitudes of thought and will he had passed through this twelvemonth, and how the idea of giving up all had affected him. "The spectre of a wasted life has passed before me—a vision of that servant who hid his talent in a napkin and buried it."

Early in 1853 he writes how much he was cheered by his sister's advice and encouragement to persist in the struggle; but the darkest moment was still to come. His hopes from his candidature crumbled away one after the other; his leave from the Admiralty was coming to an end, and there was small hope of renewing it; the grant from Government remained as unattainable as ever; the long struggle had taught him the full extent of his powers only, it seemed, to end by denying him all opportunity for their use.

And so the card house I have been so laboriously building up these two years with all manner of hard struggling will be tumbled down again, and my small light will be ignominiously snuffed out like that of better men. . . . I can submit if the fates are too strong. The world is no better than an arena of gladiators, and I, a stray savage, have been turned into it to fight my way with my rude club among the steel-clad fighters. Well, I have won my way into the front rank, and ought to be thankful.

and deem it only the natural order of things if I can get no further.

And again in a letter of July 6, 1853:—

I know that these three years have inconceivably altered me—that from being an idle man, only too happy to flow into the humours of the moment, I have become almost unable to exist without active intellectual excitement. I know that in this I find peace and rest such as I can attain in no other way. From being a mere untried fledgling, doubtful whether the wish to fly proceeded from mere presumption or from budding wings, I have now some confidence in well-tried pinions, which have given me rank among the strongest and foremost. I have always felt how difficult it was for you to realise all this—how strange it must be to you that though your image remained as bright as ever, new interests and purposes had ranged themselves around it, and though they could claim no pre-eminence, yet demanded their share of my thoughts. I make no apology for this—it is man's nature and the necessary influence of circumstances which will so have it; and depend, however painful our present separation may be, the spectacle of a man who had given up the cherished purpose of his life, the Esau who had sold his birthright for a mess of pottage and with it his self-respect, would before long years were over our heads be infinitely more painful. Depend upon it, the trust which you placed in my hands when I left you—to choose for both of us—has not been abused. Hemmed in by all sorts of difficulties, my choice was a narrow one, and I was guided more by circumstances than my own free will. Nevertheless the path has shown itself to be a fair one, neither more difficult nor less so than most paths in life in which a man of energy may hope to do much if he believes in himself, and is at peace within.

My course in life is taken. I will *not* leave London—I *will* make myself a name and a position as well as an income by some kind of pursuit connected with science, which is the thing for which nature has fitted me if she has ever fitted any one for anything. Bethink yourself whether you can cast aside all repining and all doubt, and devote yourself in patience and trust to helping me along my path as no one else could. I know what I ask, and the sacrifice I demand, and if this were the time to use false modesty, I should say how little I have to offer in return. . . .

I am full of faults, but I am real and true, and the whole devotion of an earnest soul cannot be overprized.

. . . It is as if all that old life at Holmwood had merely been a preparation for the real life of our love—as if we were then children ignorant of life's real purpose—as if these last months had merely been my old doubts over again, whether I had rightly or wrongly interpreted the manner and the words that had given me hope. . . .

We will begin the new love of woman and man, no longer that of boy and girl, conscious that we have aims and purposes as well as affections, and that if love is sweet life is dreadfully stern and earnest.

As time went on and no permanency offered—although a good deal of writing fell in his way—the strain told heavily upon him. In the autumn he was quite out of sorts, body and mind, more at war with himself than he ever was in his life before. All this, he writes, had darkened his thoughts, had made him once more imagine a hopeless discrepancy between the two of them in their ways of thinking and objects in life. It was not till November 1853 that this depression was banished by the trust and confidence of her last letter. “I wish to Heaven,” he writes, “it had reached me six months ago. It would have saved me a world of pain and error.” But with this, the worst period of mental suffering was over, and every haunting doubt was finally exorcised. His career was made possible by the steady faith which neither separation nor any misgiving nor its own troubles could shake. And from this point all things began to brighten. His health had been restored by a trip to the Pyrenees with his brother George in September. He had got work that enabled him to regard the Admiralty and its menaces with complete equanimity; a *Manual of Comparative Anatomy*, for Churchill the publisher, regular work on the *Westminster*,\* and another book in prospect, “so that if I quit the Service to-morrow, these will give me more than

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\* This regular work was the article on Contemporary Science, which in October 1854 he got Tyndall to share with him. For, he writes, “To give some account of the books in one's own department is no particular trouble, and comes with me under the head of being paid for what I *must*, in any case, do—but I neither will, nor can, go on writing about books in other departments, of which I am not competent to form a judgment even if I had the time to give to them.”



my pay has been." And on December 7 he writes how he has been restored and revived by reading over her last two letters, and confesses, "I have been unjust to the depth and strength of your devotion, but will never do so again." Then he tells all he had gone through before leaving England in September for his holiday—how he had resolved to abandon all his special pursuits and take up Chemistry, for practical purposes, when first one publisher and then another asked him to write for them, and hopes were held out to him of being appointed to deliver the Fullarian lectures at the Royal Institution for the next three years; while, most important of all, Edward Forbes was likely before long, to leave his post at the Museum of Practical Geology, and he had already been spoken to by the authorities about filling it. This was worth some £200 a year, while he calculated to make about £250 by his pen alone. "Therefore it would be absurd to go hunting for chemical birds in the bush when I have such in the hand."

## CHAPTER VII

1851-1853

SEVERAL letters dating from 1851 to 1853 help to fill up the outlines of Huxley's life during those three years of struggle. There is a description of the British Association meeting at Ipswich in 1851,\* with the traditional touch of gaiety to enliven the gravity of its proceedings, and the unconventional jollity of the Red Lion Club (a dining-club of members of the Association), whose palmy days were those under the inspiration of the genial and gifted Forbes. This was the meeting at which Huxley first began his alliance with Tyndall, with whom he travelled down from town, although he does not mention his name in this letter. With Hooker he had already made acquaintance; and from this time forwards the three were closely bound together by personal regard as well as by similarity of aims and interests.

Then follow his sketch of the English scientific world as he found it in 1851, given in his letter to W. Macleay; several letters to his sister; the description of his first lecture at the Royal Institution, which, though successful on the whole, was very different in manner and delivery from the clear and even flow of his later style, with the voice not loud but distinct, the utterance never hurried beyond the point of immediate comprehension, but carrying the attention of the audience with it, eager to the end. Two letters of warning and remonstrance against the habits of lecturing

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\* "Forbes advises me to go down to the meeting of the British Association this year and make myself notorious somehow or other. Thank Heaven I have impudence enough to lecture the savans of Europe if necessary. Can you imagine me holding forth?" (June 6, 1851.)

in a colloquial tone, suitable to a knot of students gathered round his table, but not to a large audience—of running his words, especially technical terms, together—of pouring out new and unfamiliar matter at breakneck speed, were addressed to him—one by a “working man” of his Monday evening audience at Jermyn Street in 1855, the other, undated, by Mr. Jodrell, a frequenter of the Royal Institution, and afterwards founder of the Jodrell Lectureships at University College, London, and other benefactions to science, and these he kept by him as a perpetual reminder, labelled “Good Advice.” How much can be done by the frank acceptance of criticism and by careful practice is shown by the difference between the feelings of the later audiences who flocked to his lectures, and those of the members of an Institute in St. John’s Wood, who, as he often used to tell, after hearing him in his early days, petitioned “not to have that young man again.”

July 12, 1851.—The interval between my letters has been a little longer than usual, as I have been very busy attending the meeting of the British Association at Ipswich. The last time I attended one was at Southampton five years ago, when I went merely as a spectator, and looked at the people who read papers as if they were somebodies.\* This time I have been behind the scenes myself and have played out my little part on the boards. I know all about the scenery and decorations, and no longer think the manager a wizard.

Any one who conceives that I went down from any especial interest in the progress of science makes a great mistake. My journey was altogether a matter of policy, partly for the purpose of doing a little necessary trumpeting, and partly to get the assistance of the Association in influencing the Government.

On the journey down, my opposite in the railway carriage turned out to be Sir James Ross, the Antarctic discoverer. We had some very pleasant talk together. I knew all about him, as Dayman † had sailed under his command; oddly enough we afterwards went to lodge at the same house, but as we were attending our respective sections all day we did not see much of one another.

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\* See Chap. II., *ad fin.*

† One of the lieutenants of the *Rattlesnake*.

When we arrived at Ipswich there was a good deal of trouble about getting lodgings. My companions located themselves about a mile out of the town, but that was too far for my "indolent habits"; I sought and at last found a room in the town a little bigger than my cabin on board ship for which I had the satisfaction of paying 30s. a week.

You know what the British Association is. It is a meeting of the savans of England and the Continent, under the presidency of some big-wig or other,—this year of the Astronomer-Royal,—for the purpose of exchanging information. To this end they arrange themselves into different sections, each with its own president and committee, and indicated by letters. For instance, Section A is for Mathematics and Physics; Section B for Chemistry, etc.; my own section, that of Natural History, was D, under the presidency of Professor Henslow of Cambridge. I was on the committee, and therefore saw the working of the whole affair.

On the first day there was a dearth of matter in our section. People had not arrived with their papers. So by way of finding out whether I could speak in public or not, I got up and talked to them for about twenty minutes. I was considerably surprised to find that when once I had made the plunge, my tongue went glibly enough.

On the following day I read a long paper, which I had prepared and illustrated with a lot of big diagrams, to an audience of about twenty people! The rest were all away after Prince Albert, who had been unfortunately induced to visit the meeting, and fairly turned the heads of the good people of Ipswich. On Saturday a very pleasant excursion on scientific pretences, but in fact a most jolly and unscientific picnic, took place. Several hundred people went down the Orwell in a steamer. The majority returned, but I and two others, considering Sunday in Ipswich an impossibility, stopped at a little seaside village, Felixstowe, and idled away our time there very pleasantly. Babington the botanist and myself walked in to Ipswich on Sunday night. It is about eleven miles, and we did it comfortably in two hours and three quarters, which was not bad walking.

On Monday at Section D again. Forbes brought forward the subject of my application to Government in committee, and it was unanimously agreed to forward a resolution on the subject to the Committee of Recommendations. I made a speechification of some length in the Section about a new animal.

On Thursday morning I attended a meeting of the Ray

Society, and to my infinite astonishment, the secretary, Dr. Lankester, gave me the second motion to make. The Prince of Casino moved the first, so I was in good company. The great absurdity of it was that not being a member of the Society I had properly no right to speak at all. However, it was only a vote of thanks, and I got up and did the "neat and appropriate" in style.

After this a party of us went out dredging in the Orwell in a small boat. We were away all day, and it rained hard coming back, so that I got wet through, and had to pull five miles to keep off my enemy, the rheumatics.

Then came the President's dinner, to which I did not go, as I preferred making myself comfortable with a few friends elsewhere. And after that, the final evening meeting, when all the final determinations are announced.

Among them I had the satisfaction to hear that it was resolved—that the President and Council of the British Association should co-operate with the Royal Society in representing the value and importance, etc., of Mr. T. H. Huxley's zoological researches to Her Majesty's Government for the purpose of obtaining a grant towards their publication. Subsequently I was introduced to Colonel Sabine, the President of the Association in 1852, and a man of very high standing and considerable influence. He had previously been civil enough to sign my certificate at the Royal Society, unsolicited, and therefore knew me by reputation—I only mean that as a very small word. He was very civil and promised me every assistance in his power.

It is a curious thing that out of the four applications to Government to be made by the Association, two were for Naval Assistant-Surgeons, viz. one for Dr. Hooker, who had just returned from the Himalaya Mountains, and one for me. How I envied Hooker; he has long been engaged to a daughter of Professor Henslow's, and at this very meeting he sat by her side. He is going to be married in a day or two. His father is director of the Kew Gardens, and there is little doubt of his succeeding him.

Whether the Government accede to the demand that will be made upon them or not, I can now rest satisfied that no means of influencing them has been left unused by me. If they will not listen to the conjoint recommendations of the Royal Society and the British Association, they will listen to nothing. . . .

July 16, 1851.—I went yesterday to dine with Colonel Sabine. We had a long discourse about the prospects and probable means of existence of young men trying to make their way to an existence in the scientific world. I took, as indeed what I have seen has forced me to take, rather the despairing side of the question, and said that as it seemed to me England did not afford even the means of existence to young men who were willing to devote themselves to science. However, he spoke cheerfully, and advised me by no means to be hasty, but to wait, and he doubted not that I should succeed. He cited his own case as an instance of waiting, eventually successful. Altogether I felt the better for what he said. . . .

There has been a notice of me in the *Literary Gazette* for last week, much more laudatory than I deserve, from the pen of my friend Forbes.\* . . .

In the same number is a rich song from the same fertile and versatile pen, which was sung at one of our Red Lion meetings. That is why I want you to look at it, not that you will understand it, because it is full of allusions to occurrences known only in the scientific circles. At Ipswich we had a grand Red Lion meeting; about forty members were present, and among them some of the most distinguished members of the Association. Some foreigners were invited (the Prince of Casino, Buonaparte's nephew, among others), and were not a little astonished to see the grave professors, whose English solemnity and gravity they had doubtless commented on elsewhere, giving themselves up to all sorts of fun. Among the Red Lions we have a custom (instead of cheering) of waving and wagging one coat-tail (one Lion's tail) when we applaud. This seemed to strike the Prince's fancy amazingly, and when he got up to return thanks for his health being drunk, he told us that as he was rather out of practice in speaking English, he would return thanks in our fashion, and therewith he gave three mighty roars and wags, to the no small amusement of every one. He is singularly like the portraits of his uncle, and seems a very jolly, good-humoured old fellow. I believe, however, he is a bit of a rip. It was remarkable how proud the Quakers were of being noticed by him.

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\* An appreciation of his papers on the Physophoridae and Sagitta, speaking highly both of his observations and philosophic power, in the report of the proceedings in Section D.

## TO W. MACLEAY, OF SYDNEY

41 NORTH BANK, REGENT'S PARK, Nov. 9, 1851.

MY DEAR SIR—It is a year to-day since the old *Rattlesnake* was paid off, and that reminds me among other things that I have hardly kept my promise of giving you information now and then upon the state of matters scientific in England. My last letter is, I am afraid, nine or ten months old, but here in England the fighting and scratching to keep your place in the crowd exclude almost all other thoughts. When I last wrote I was but at the edge of the crush at the pit-door of this great fools' theatre—now I have worked my way into it and through it, and am, I hope, not far from the check-takers. I have learnt a good deal in my passage.

[Follows an account of his efforts to get his papers published—substantially a repetition of what has already been given.]

Rumours there are scattered abroad of a favourable cast, and I am told on all hands that something will certainly be done. I only asked for £300, something less than the cost of a parliamentary blue-book which nobody ever hears of. They take care to obliterate any spark of gratitude that might perchance arise for what they do, by keeping one so long in suspense that the result becomes almost a matter of indifference. Had I known they would keep me so long, I would have published my work as a series of papers in the *Philosophical Transactions*.

In the meanwhile I have not been idle, as I hope to show you by the various papers enclosed with this. You will recollect that on the *Salpæ*. No one here knew anything about them, and I thought that all my results were absolutely new—until, *me miserum!* I found them in a little paper of Krohn's in the *Annales des Sciences* for 1846, without any figures to draw anybody's attention.

The memoir on the *Medusæ* (which I sent to you) has, I hear, just escaped a high honour—to wit, the Royal Medal. The award has been made to Newport for his paper on "Impregnation." I had no idea that anything I had done was likely to have the slightest claim to such distinction, but I was informed yesterday by one of the Council that the balance hung pretty evenly, and was only decided by their thinking my memoir was too small and short.

I have been working in all things with a reference to wide views of zoological philosophy, and the report upon the Echinoderms is intended in common with the mem. on the Salpae to explain my views of Individuality among the lower animals—views which I mean to illustrate still further and enunciate still more clearly in my book that is to be.\* They have met with approval from Carpenter, as you will see by the last edition of his *Principles of Physiology*, and I think that Forbes and some others will be very likely eventually to come round to them, but everything that relates to abstract thought is at a low ebb among the mass of naturalists in this country.

In the paper upon “Thalassicolla,” and in that which I read before the British Association, as also in one upon the organisation of the Rotifera, which I am going to have published in the Microscopical Society’s *Transactions*, I have been driving in a series of wedges into Cuvier’s Radiata, and showing how *selon moi* they ought to be distributed.

I am every day becoming more and more certain that you were on the right track thirty years ago in your views of the order and symmetry to be traced in the true natural system.

During the next session I mean to send in a paper to the R.S. upon the “Homologies of the Mollusca,” which shall astonish them. I want to get done for the Mollusca what Savigny did for the Articulata, viz. to show how they all—Cephalopoda, Gasteropoda, Pteropoda, Heteropoda, etc.—are organised on one type, and how the homologous organs are modified in each. What with this and the book, I shall have enough to do for the next six months.

You will doubtless ask what is the practical outlook of all this? whether it leads anywhere in the direction of bread and cheese? To this also I can give a tolerably satisfactory answer.

As you *won't* have a Professor of Natural History at Sydney—to my great sorrow—I have gone in as a candidate for a Professorial chair at the other end of the world, Toronto in Canada. In England there is nothing to be done—it is the most hopeless prospect I know of; of course the Service offers nothing for me except irretrievable waste of time, and the scientific appointments are so few and so poor that they are not tempting. . . .

Had the Sydney University been carried out as originally proposed, I should certainly have become a candidate for the

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\* He lectured on this subject at the Royal Institution in 1852.



Natural History Chair. I know no finer field for exertion for any naturalist than Sydney Harbour itself. Should such a Professorship be hereafter established, I trust you will jog the memory of my Australian friends in my behalf. I have finally decided that my vocation is science, and I have made up my mind to the comparative poverty which is its necessary adjunct, and to the no less certain seclusion from the ordinary pleasures and rewards of men. I say this without the slightest idea that there is anything to be enthusiastic about in either science or its professors. A year behind the scenes is quite enough to disabuse one of all rose-pink illusions.

But it is equally clear to me that for a man of my temperament, at any rate, the sole secret of getting through this life with anything like contentment is to have full scope for the development of one's faculties. Science alone seems to me to afford this scope—Law, Divinity, Physic, and Politics being in a state of chaotic vibration between utter humbug and utter scepticism.

There is a great stir in the scientific world at present about who is to occupy Konig's place at the British Museum, and whether the whole establishment had better not, *quoad* Zoology, be remodelled and placed under Owen's superintendence. The heart-burnings and jealousies about this matter are beyond all conception. Owen is both feared and hated, and it is predicted that if Gray and he come to be officers of the same institution, in a year or two the total result will be a caudal vertebra of each remaining after the manner of the Kilkenny cats.

However, I heard yesterday, upon what professed to be very good authority, that Owen would not leave the College under any circumstances.

It is astonishing with what an intense feeling of hatred Owen is regarded by the majority of his contemporaries, with Mantell as arch-hater. The truth is, he is the superior of most, and does not conceal that he knows it, and it must be confessed that he does some very ill-natured tricks now and then. A striking specimen of one is to be found in his article on Lyell in the last Quarterly, where he pillories poor Quekett—a most inoffensive man and his own immediate subordinate—in a manner not more remarkable for its severity than for its bad taste. That review has done him much harm in the estimation of thinking men—and curiously enough, since it was written, reptiles have been found in the old red sandstone, and insectivorous mammals in the Trias! Owen is an able man, but to my

mind not so great as he thinks himself. He can only work in the concrete from bone to bone, in abstract reasoning he becomes lost—witness “Parthenogenesis” which he told me he considered one of the best things he had done!

He has, however, been very civil to me, and I am as grateful as it is possible to be towards a man with whom I feel it necessary to be always on my guard.

Quite another being is the other leader of Zoological Science in this country—I mean Edward Forbes, Paleontologist to the Geological Survey. More especially a Zoologist and a Geologist than a Comparative Anatomist, he has more claims to the title of a Philosophic Naturalist than any man I know of in England. A man of letters and an artist, he has not merged the *man* in the man of science—he has sympathies for all, and an earnest, truth-seeking, thoroughly genial disposition which win for him your affection as well as your respect. Forbes has more influence by his personal weight and example upon the rising generation of scientific naturalists than Owen will have if he write from now till Doomsday.

Personally I am greatly indebted to him (though the opinion I have just expressed is that of the world in general). During my absence he superintended the publication of my paper, and from the moment of my arrival until now he has given me all the help one man can give another. Why he should have done so I do not know, as when I left England I had only spoken to him once.

The rest of the naturalists stand far below these two in learning, originality, and grasp of mind. Goodsir of Edinburgh should I suppose come next, but he can't write intelligibly. Darwin might be anything if he had good health. Bell is a good man in all the senses of the word, but wants qualities 2 and 3. Newport is a laborious man, but wants 1 and 3. Grant and Rymer Jones—*arcades ambo*—have mistaken their vocation.

My old chief Richardson is a man of men, but troubles himself little with anything but detail zoology. What think you of his getting married for the third time just before his last expedition? I hardly know by which step he approved himself the bolder man.

I think I have now fulfilled my promise of supplying you with a little scientific scandal—and if this long epistle has repaid your trouble in getting through it, I am content.

Believe me, I have not forgotten, nor ever shall forget, your kindness to me at a time when a little appreciation and encour-

agement were more grateful to me and of more service than they will perhaps ever be again. I have done my best to justify you.

I send copies of all the papers I have published with one exception, of which I have none separate. Of the Royal Society papers I send a double set. Will you be kind enough to give one with my kind regards and remembrances to Dr. Nicholson? I feel I ought to have written to him before leaving Sydney, but I trust he will excuse my not having done so.

I shall be very glad if you can find time to write.—Ever  
yours faithfully,

T. H. HUXLEY.

W. Macleay, Esq.

P.S.—Müller has just made a most extraordinary discovery, no less than the generation of Molluscs from Holothuriae!!! You will find a translation of his paper by me in the *Annals* for January 1852.

Dec. 13, 1851.

#### TO HIS SISTER

May 20, 1851.

. . . Owen has been amazingly civil to me, and it was through his writing to the First Lord that I got my present appointment. He is a queer fish, more odd in appearance than ever . . . and more bland in manner. He is so frightfully polite that I never feel thoroughly at home with him. He got me to furnish him with some notes for the second edition of the *Admiralty Manual of Scientific Inquiry*, and I find that in it Darwin and I (comparisons are odorous) figure as joint authorities on some microscopic matters!!

Professor Forbes, however, is my great ally, a first-rate man, thoroughly in earnest and disinterested, and ready to give his time and influence—which is great—to help any man who is working for the cause. To him I am indebted for the supervision of papers that were published in my absence, for many introductions, and most valuable information and assistance, and all done in such a way as not to oppress one or give one any feeling of patronage, which you know (so much do I retain of my old self) would not suit me. My notions are diametrically opposed to his in some matters, and he helps me to oppose him. The other night, or rather nights, for it took three, I had a long paper read at the Royal Society which opposed some of his views, and he got up and spoke in the highest terms of it after-

wards. This is all as it should be. I can reverence such a man and yet respect myself.

I have been aspiring to great honours since I wrote to you last, to wit the F.R.S., and found no little to my astonishment that I had a chance of it, and so went in. I must tell you that they have made the admission more difficult than it used to be. Candidates are not elected by the Society alone, but fifteen only a year are selected by a committee, and then elected as a matter of course by the Society. This year there were thirty-eight candidates. I did not expect to come in till next year, but I find I am one of the selected. I fancy I shall be the junior Fellow by some years. Singularly enough, among the non-selected candidates were Ward, the man who conducted the Botanical Honours Examination of Apothecaries' Hall nine years ago, and Bryson, the surgeon of the *Fisguard*, *i.e.* nominally my immediate superior, and who, as he frequently acts as Sir Wm. Burnett's deputy, *will very likely examine me when I pass for Surgeon R.N.!!* That is awkward and must be annoying to him, but it is not my fault. I did not ask for a single name that appeared upon my certificate. Owen's name and Carpenter's, which were to have been appended, were not added. Forbes, my recommender, told me beforehand not to expect to get in this year, and did not use his influence, and so I have no intriguing to reproach myself with or to be reproached with. The only drawback is that it will cost me £14, which is more than I can very well afford.

By the way, I have not told you that after staying for about five months with George, I found that if I meant to work in earnest his home was not the place, so, much to my regret,—for they made me very happy there,—I summoned resolution and *The Boy's Own Book* and took a den of my own, whence I write at present. You had better, however, direct to George, as I am going to move and don't know how long I may remain at my next habitation. At present I am living in the Park Road, but I find it too noisy and am going to St. Anne's Gardens, St. John's Wood, close to my mother's, against whose forays I shall have to fortify myself.

It was a minor addition to his many troubles that after a time Huxley found a grudging and jealous spirit exhibited in some quarters towards his success, and influence used to prevent any further advance that might endanger the existing balance of power in the scientific world. But this could

be battled with directly; indeed it was rather a relief to have an opportunity for action instead of sitting still to wait the results of uncertain elections. The qualities requisite for such a contest he possessed, in a high ideal of the dignity of science as an instrument of truth; a standard of veracity in scientific workers to which all should subordinate their personal ambitions; a disregard of authority as such unless its claims were verified by indisputable fact; and as a beginning, the will to subject himself to his own most rigid canons of accuracy, thoroughness, and honesty; then to maintain his principle and defend his position against all attempts at browbeating.

*March 5, 1852.*

I told you I was very busy, and I must tell you what I am about and you will believe me. I have just finished a Memoir for the Royal Society,\* which has taken me a world of time, thought, and reading, and is, perhaps, the best thing I have done yet. It will not be read till May, and I do not know whether they will print it or not afterwards; that will require care and a little manœuvring on my part. You have no notion of the intrigues that go on in this blessed world of science. Science is, I fear, no purer than any other region of human activity; though it should be. Merit alone is very little good; it must be backed by tact and knowledge of the world to do very much.

For instance, I know that the paper I have just sent in is very original and of some importance, and I am equally sure that if it is referred to the judgment of my "particular friend" — that it will not be published. He won't be able to say a word against it, but he will pooh-pooh it to a dead certainty.

You will ask with some wonderment, Why? Because for the last twenty years — has been regarded as the great authority on these matters, and has had no one to tread on his heels, until at last, I think, he has come to look upon the Natural World as his special preserve, and "no poachers allowed." So I must manœuvre a little to get my poor memoir kept out of his hands.

The necessity for these little stratagems utterly disgusts me. I would so willingly reverence and trust any man of high standing and ability. I am so utterly unable to comprehend this petty

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\* "On the Morphology of the Cephalous Mollusca," *Scientific Memoirs*, vol. i. p. 152.

greediness. And yet withal you will smile at my perversity. I have a certain pleasure in overcoming these obstacles, and fighting these folks with their own weapons. I do so long to be able to trust men implicitly. I have such a horror of all this literary pettifogging. I could be so content myself, if the necessity of making a position would allow it, to work on anonymously, but — I see is determined not to let either me or any one else rise if he can help it. Let him beware. On my own subjects I am his master, and am quite ready to fight half a dozen dragons. And although he has a bitter pen, I flatter myself that on occasions I can match him in that department also.

But I was telling you how busy I am. I am getting a memoir ready for the Zoological Society, and working at my lecture for the Royal Institution, which I want to make striking and original, as it is a good opportunity, besides doing a translation now and then for one of the Journals. Besides this, I am working at the British Museum to make a catalogue of some creatures there. All these things take a world of time and labour, and yield next to no direct profit; but they bring me into contact with all sorts of men, in a very independent position, and I am told, and indeed hope, that something must arise from it. So fair a prospect opens out before me if I can only wait. I am beginning to know what *work* means, and see how much more may be done by steady, unceasing, and well-directed efforts. I thrive upon it too. I am as well as ever I was in my life, and the more I work the better my temper seems to be.

April 30, 1852. 11½ P.M.

I have just returned from giving my lecture \* at the Royal Institution, of which I told you in my last letter.

I had got very nervous about it, and my poor mother's death had greatly upset my plans for working it out.

It was the first lecture I had ever given in my life, and to what is considered the best audience in London. As nothing ever works up my energies but a high flight, I had chosen a very difficult abstract point, in my view of which I stand almost alone. When I took a glimpse into the theatre and saw it full of faces, I did feel most amazingly uncomfortable. I can now quite understand what it is to be going to be hanged, and nothing but the necessity of the case prevented me from running away.

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\* "On Animal Individuality," *Scientific Memoirs*, vol. i. p. 146, cp. p. 88, *supra*.

However, when the hour struck, in I marched, and began to deliver my discourse. For ten minutes I did not quite know where I was, but by degrees I got used to it, and gradually gained perfect command of myself and of my subject. I believe I contrived to interest my audience, and upon the whole I think I may say that this essay was successful.

Thank Heaven I can say so, for though it is no great matter succeeding, failing would have been a bitter annoyance to me. It has put me comfortably at my ease with regard to all future lecturings. After the Royal Institution there is no audience I shall ever fear.

*May 9.*

The foolish state of excitement into which I allowed myself to get the other day completely did for me, and I have hardly done anything since except sleep a great deal. It is a strange thing that with all my will I cannot control my physical organisation.

#### TO HIS SISTER

*April 17, 1852.*

. . . I fear nothing will have prepared you to hear that one so active in body and mind as our poor mother was has been taken from us. But so it is. . . .

It was very strange that before leaving London my mother, possessed by a strange whim, as I thought, distributed to many of us little things belonging to her. I laughed at her for what I called her "testamentary disposition," little dreaming that the words were prophetic.

[The summons to those of the family in London reached them late, and their arrival was made still later by inconvenient trains and a midnight drive, so that all had long been over when they came to Barning in Kent, where the elder Huxleys had just settled near their son James.]

Our mother had died at half-past four, falling gradually into a more and more profound insensibility. She was thus happily spared the pain of fruitlessly wishing us round her, in her last moments; and as the hand of Death was upon her, I know not that it could have fallen more lightly.

I offer you no consolation, my dearest sister, for I know of none. There are things which each must bear as he best may with the strength that has been allotted to him. Would that I were near you to soften the blow by the sympathy which we should have in common. . . .

May 3, 1852.

So much occupation has crowded upon me between the beginning of this letter and the present time that I have been unable to finish it. I had undertaken to give a lecture at the Royal Institution on the 30th April. It was on a difficult subject, requiring a good deal of thought; and as it was my first appearance and before the best audience in London, you may imagine how anxious and nervous I was, and how completely I was obliged to abstract my thoughts from everything else.

However, I am happy to say it is well over. There was a very good audience—Faraday, Prof. Forbes, Dr. Forbes, Wharton Jones, and [a] whole lot of “nobs,” among my auditors. I had made up my mind all day to break down, and then go and hang myself privately. And so you may imagine that I entered the theatre with a very pale face, and a heart beating like a sledge-hammer nineteen to the dozen. For the first five minutes I did not know very clearly what I was about, but by degrees I got possession of myself and of my subject, and did not care for anybody. I have had “golden opinions from all sorts of men” about it, so I suppose I may tell you I have succeeded. I don’t think, however, that I ever felt so thoroughly used up in my life as I did for two days afterwards. There is one comfort, I shall never be nervous again about any audience; but at one’s first attempt, to stand in the place of Faraday and such big-wigs might excuse a little weakness.

The way is clear before me, if my external circumstances will only allow me to persevere; but I fully expect that I shall have to give up my dreams.

Science in England does everything—but *pay*. You may earn praise but not pudding.

I have helping hands held out to me on all sides, but there is nothing to help me to. Last year I became a candidate for a Professorship at Toronto. I took an infinity of trouble over the thing, and got together a mass of testimonials and recommendations, much better than I had any right to expect. From that time to this I have heard nothing of the business—a result for which I care the less, as I believe the chair will be given to a brother of one of the members of the Canadian ministry, who is, I hear, a candidate. Such a qualification as that is, of course, better than all the testimonials in the world.

I think I told you when I last wrote that I was expecting a grant from Government to publish the chief part of my work, done while away. I am expecting it still. I got tired of waiting



the other day and wrote to the Duke of Northumberland, who is at present First Lord of the Admiralty, upon the subject. His Grace has taken the matter up, and I hope now to get it done.

With all this, however, Time runs on. People look upon me, I suppose, as a "very promising young man," and perhaps envy my "success," and I all the while am cursing my stars that my Pegasus *will* fly aloft instead of pulling slowly along in some respectable gig, and getting his oats like any other praiseworthy cart-horse.

It's a charming piece of irony altogether. It is two years yesterday since I left Sydney harbour—and of course as long since I saw Nettie. I am getting thoroughly tired of our separation, and I think she is, though the dear little soul is ready to do anything for my sake, and yet I dare not face the stagnation—the sense of having failed in the whole purpose of my existence—which would, I know, sooner or later beset me, even with her, if I forsake my present object. Can you wonder with all this, my dearest Lizzie, that often as I long for your brave heart and clear head to support and advise me, I yet rarely feel inclined to write? Pray write to me more often than you have done; tell me all about yourself and the Doctor and your children. They must be growing up fast, and Florry must be getting beyond the "Bird of Paradise" I promised her. Love and kisses to all of them, and kindest remembrances to the Doctor.—Ever your affectionate brother,  
T. H. HUXLEY.

### TO MISS HEATHORN

Nov. 13, 1852.

Going last week to the Royal Society's library for a book, and like the boy in church "thinkin' o' naughten," when I went in, Weld, the Assistant Secretary, said, "Well, I congratulate you." I confess I did not see at that moment what any mortal man had to congratulate me about. I had a deuced bad cold, with rheumatism in my head; it was a beastly November day and I was very grumpy, so I inquired in a state of mild surprise what might be the matter. Whereupon I learnt that the Medal had been conferred at the meeting of the Council on the day before. I was very pleased . . . and I thought you would be so too, and I thought moreover that it was a fine lever to help us on, and if I could have sent a letter to you immediately I should have sat down and have written one to you on the spot.

As it is I have waited for official confirmation and a convenient season.

And now . . . shall I be very naughty and make a confession? The thing that a fortnight ago (before I got it) I thought so much of, I give you my word I do not care a pin for. I am sick of it and ashamed of having thought so much of it, and the congratulations I get give me a sort of internal sardonic grin. I think this has come about partly because I did not get the official confirmation of what I had heard for some days, and with my habit of facing the ill side of things I came to the conclusion that Weld had made a mistake, and I went in thought through the whole enormous mortification of having to explain to those whom I had mentioned it that it was quite a mistake. I found that all this, when I came to look at it, was by no means so dreadful as it seemed—quite bearable in short—and then I laughed at myself and have cared nothing about the whole concern ever since. In truth . . . I do not think that I am in the proper sense of the word ambitious. I have an enormous longing after the highest and best in all shapes—a longing which haunts me and is the demon which ever impels me to work, and will let me have no rest unless I am doing his behests. The honours of men I value so far as they are evidences of power, but with the cynical mistrust of their judgment and my own worthiness, which always haunts me, I put very little faith in them. Their praise makes me sneer inwardly. God forgive me if I do them any great wrong.

. . . I feel and know that all the rewards and honours in the world will ever be worthless for me as soon as they are obtained. I know that always, as now, they will make me more sad than joyful. I know that nothing that could be done would give me the pure and heartfelt joy and peace of mind that your love has given me, and, please God, shall give for many a long year to come, and yet my demon says work! work! you shall not even love unless you work.

Not blinded by any vanity, then, I hope . . . but viewing this stroke of fortune as respects its public estimation only, I think I must look upon the award of this medal as the turning-point of my life, as the finger-post teaching me as clearly as anything can what is the true career that lies open before me. For whatever may be my own private estimation of it, there can be no doubt as to the general feeling about this thing, and in case of my candidature for any office it would have the very greatest weight. And as you will have seen by my last letter,

it only strengthens and confirms the conclusion I had come to. Bid me God-speed then . . . it is all I want to labour cheerfully.

*Nov. 28.*

. . . You will hear all the details of the Great Duke's state funeral from the papers much better than I can tell you them. I went to the Cathedral (St. Paul's) and had the good fortune to get a capital seat—in front, close to the great door by which every one entered. It was bitter cold, a keen November wind blowing right in, and as I was there from eight till three, I expected nothing less than rheumatic fever the next day; however I didn't get it. It was pitiful to see the poor old Marquis of Anglesey—a year older than the Duke—standing with bare head in the keen wind close to me for more than three quarters of an hour. It was impressive enough—the great interior lighted up by a single line of light running along the whole circuit of the cornice, and another encircling the dome, and casting a curious illumination over the masses of uniforms which filled the great space. The best of our people were there and passed close to me, but the only face that made any great impression upon my memory was that of Sir Chas. Napier, the conqueror of Scinde. Fancy a very large, broad-winged, and fierce-looking hawk in uniform. Such an eye!

When the coffin and the mourners had passed I closed up with the soldiers and went up under the dome, where I heard the magnificent service in full perfection.

All of it, however, was but stage trickery compared with the noble simplicity of the old man's life. How the old stoic, used to his iron bed and hard hair pillow, would have smiled at all the pomp—submitting to that, however, and all other things necessary to the “carrying on of the Queen's Government.”

I send Tennyson's ode by way of packing—it is not worth much more, the only decent passages to my mind being those I have marked.

The day after to-morrow I go to have my medal presented and to dine and make a speech.

The Royal Medal was conferred on November 30, and the medallists were entertained at the anniversary dinner of the Society on that day. In the words with which the President, the Earl of Rosse, accompanied the presentation of the medal, “it is not difficult,” writes Sir M. Foster, “reading between the lines, to recognise the appreciation of

a new spirit of anatomical inquiry, not wholly free from a timorous apprehension as to its complete validity." \* For the difference between this and the labours of the greatest English comparative anatomist of the time, whose detailed work was of the highest value, but whose generalisations and speculations, based on the philosophy of Oken, proved barren and fruitless, lay in the fact that Huxley, led to it doubtless by his solitary readings in his Charing Cross days, had taken up the method of von Baer and Johannes Müller, then almost unknown, or at least unused in England—"the method which led the anatomist to face his problems in the spirit in which the physicist faced his."

He had been warned by Forbes not to speak too strongly about the dilatoriness of the Government in the matter of the grant, so he writes: "I will 'roar you like any sucking dove' at the dinner, though I felt tempted otherwise." On December 1 he tells how he carried out this advice.

MY DEAR FORBES—You will, I know, like to learn how I got on yesterday. The President's address to me had been drawn up by Bell. It was, of course, too flattering, but he had taken hold of the right points in my work—at least I thought so.

Bunsen spoke very well for Humboldt.

There was a capital congregation at the dinner—sixty or seventy Fellows there. . . .

When it came to my turn to return thanks, I believe I made a very tolerable speechification, at least everybody says so. Lord Rosse had alluded to "science having to take care of itself in this country," and in winding up I gave them a small screed upon that text. That you may see I kept your caution in mind, I will tell you as nearly as may be what I said. I told them that I could not conceive that anything I had hitherto done merited the honour of that day (I looked so preciously meek over

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\* "In these papers (on the *Medusæ*) you have for the first time fully developed their structure, and laid the foundation of a rational theory for their classification." "In your second paper 'On the Anatomy of *Salpa* and *Pyrosoma*,' the phenomena, etc., have received the most ingenious and elaborate elucidation, and have given rise to a process of reasoning, the results of which can scarcely yet be anticipated, but must bear in a very important degree upon some of the most abstruse points of what may be called transcendental physiology." See *Royal Society*, Obituary Notices, vol. lix. p. 1.

this), but that I was glad to be able to say that I had so much unpublished material as to make me hopeful of one day diminishing the debt. I then said, "The Government of this country, of this *great* country, has been two years debating whether it should grant the three hundred pounds necessary for the publication of these researches. I have been too long used to strict discipline to venture to criticise any act of my superiors, but I venture to hope that before long, in consequence of the exertions of Lord Rosse, of the President of the British Association, and the goodwill, which I gratefully acknowledge, of the present Lord of the Admiralty, I shall be able to lay before you something more worthy of to-day's award."

I had my doubts how the nobles would take it, but both Lord Rosse and Sabine warmly commended my speech and regretted I had not said even more upon the subject.

Some light is thrown upon his habits at this time by the following, part of his letter to Forbes of November 19:—

I have frequent visits from ——. He is a good man, but direfully argumentative, and in that sense to me a bore. Besides that, the creature will come and call upon me at nine or ten o'clock in the morning before I am out of bed, or if out of bed, before I am in possession of my faculties, which never arrive before twelve or one.

This morning incapacity was of a piece with his hatred of the breakfast-party of the period. To go abroad from home or to do any work before breakfasting ensured him a headache for the rest of the day, so that he never was one of those risers with the dawn who do half a day's work before the rest of the world is astir. And though necessity often compelled him to do with less, he always found eight hours his proper allowance of sleep.

But in the end of 1853 we hear of a reform in his ways, after a bad bout of ill-health, when he rises at eight, goes to bed at twelve, and eschews parties of every kind as far as possible, with excellent results as far as health went.

After his marriage, however, and indeed to the beginning of his last illness, he always rose early enough for an eight o'clock breakfast, after which the working day began, lasting regularly from a little after nine till midnight.

4 UPPER YORK PLACE, ST. JOHN'S WOOD, *Feb.* 6, 1853.

Many thanks, my dearest sister, for your kind and thoughtful letter—it went to my heart no little that you, amidst all your trials and troubles, should find time to think so wisely and so affectionately of mine. Though greatly tempted otherwise, I have acted in the spirit of your advice, and my reward, in the shape of honours at any rate, has not failed me, as the Royal Society gave me one of the Royal medals last year. It's a bigger one than I got under your auspices so many years ago, being worth £50, but I don't know that I cared so much about it.

It was assigned to me quite unexpectedly, and in the eyes of the world I, of course, am greatly the bigger—but I will confess to you privately that I am by no means dilated, and am the identical Boy Tom I was before I achieved the attainment of my golden porter's badge. Curiously it was given for the first Memoir I have in the Royal Society's *Transactions*, sent home four years ago with no small fear and trembling, and, "after many days," returning with this queer crust of bread. In the speech I had to make at the Anniversary Dinner I grew quite eloquent on that point, and talked of the dove I had sent from my ark, returning, not with the olive branch, but with a sprig of the bay and a fruit from the garden of the Hesperides—a simile which I thought decidedly clever, but which the audience—distinguished audience I ought to have said—probably didn't, as they did not applaud that, while they did some things I said which were incomparably more stupid. This was in November, and I ought to have written to you about it before, my dear Lizzie, but for one thing I am very much occupied, and for the other (shall I confess it?) I was rather puzzled that I had not heard from you since I wrote. Now my useless conscience, which never makes me do anything right in time, is pitching in to me when it is too late.

The medal, however, must not be jested at, as it is most decidedly of practical use in giving me a status in the eyes of those charming people, "practical men," such as I had not before, and I am amused to find some of my friends, whose contempt for my "dreamy" notions was not small in time past, absolutely advising me to take a far more dreamy course than I dare venture upon. However, I take very much my own course now, even as I have done before—Huxley all over.

However, that is enough about myself just now. In the next letter I will tell you more at length about my plans and prospects, which are mostly, I am sorry to say, only provocative of

setting my teeth hard and saying, "Never mind, I *will*." But what I write in a hurry about and want you to do at once, is to write to me and tell me exactly how money may be sent safely to you. It is inexpedient to send without definite directions, according to the character you give your neighbours. Don't expect anything vast, but there is corn in Egypt. . . .

Two classes of people can I deal with and no third. They are the good people—people after my own heart, and the thorough men of the world. Either of these I can act and sympathise with, but the others, who are neither for God nor for the Devil, but for themselves, as grim old Dante has it, and whom he therefore very justly puts in a most uncomfortable place, I cannot do with. . . .

So Florry is growing up into a great girl; the child will not remember me, but kiss her and my godson for me, and give my love to them all. The Lymph shall come in my next letter for the young Yankee. I hope the juices of the English cow will prevent him from ever acquiring the snuffle.

Tell the Doctor all about the medal, with my kindest regards, and believe me, my dearest Lizzie, your affectionate brother,

Tom.

4 UPPER YORK PLACE, ST. JOHN'S WOOD, *April 22, 1853.*

MY DEAREST LIZZIE—First let me congratulate you on being safe over your troubles and in possession of another possible President. I think it may be worth coming over twenty years hence on the possibility of picking up something or other from one of my nephews at Washington.

[He sends some money.] Would it were more worth your having, but I have not as yet got on to Tom Tiddler's ground on this side of the water. You need not be alarmed about my having involved myself in any way—such portion of it as is of my sending has been conquered by mine own sword and spear, and the rest came from Mary.\* . . .

[After giving a summary of his struggle with the Admiralty, he proceeds]—If I were to tell you all the intriguing and humbug there has been about my unfortunate grant—which yet granted—it would occupy this letter, and though a very good illustration of the encouragement afforded to Science in this country, would not be very amusing. Once or twice it has fairly died out, only to be stirred up again by my own pertinacity. However, I have hopes of it at last, as I hear Lord Rosse is

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\* Mrs. George Huxley.

just about to make another application to the present Government on the subject. While this business has been dragging on of course I have not been idle. I have four memoirs (on various matters in Comparative Anatomy) in the *Philosophical Transactions*, and they have given me their Fellowship and one of the Royal medals. I have written a whole lot of things for the journals—reviews for the *British and Foreign Quarterly Medical*, etc. I am one of the editors of Taylor's *Scientific Memoirs* (German scientific translations). In conjunction with my friend Busk I am translating a great German book on the *Microscopical Anatomy of Man*, and I have engaged to write a long article for Todd's *Cyclopædia*. Besides this, have read two long memoirs at the British Association, and have given two lectures at the Royal Institution—one of them only two days ago, when I was so ill with influenza I could hardly stand or speak.

Furthermore, I have been a candidate for a Professorship of Natural History at Toronto (which is not even yet decided); for one at Aberdeen, which has been given against me; and at present I am a candidate for the Professorship of Physiology at King's College, or, rather, for half of it—Todd having given up, and Bowman, who remains, being willing to take only half, and that he will soon give up. My friend Edward Forbes—a regular brick, who has backed me through thick and thin—is backing me for King's College, where he is one of the Professors. My chance is, I believe, very good, but nothing can be more uncertain than the result of the contest. If they don't take one of their own men I think they will have me. It would suit me very well, and the whole chair is worth £400 a year, and would enable me to live.

Something I must make up my mind to do, and that speedily. I can get honour in Science, but it doesn't pay, and "honour heals no wounds." In truth I am often very weary. The longer one lives the more the ideal and the purpose vanishes out of one's life, and I begin to doubt whether I have done wisely in giving vent to the cherished tendency towards Science which has haunted me ever since my childhood. Had I given myself to Mammon I might have been a respectable member of society with large watch-seals by this time. I think it is very likely that if this King's College business goes against me, I may give up the farce altogether—burn my books, burn my rod, and take to practice in Australia. It is no use to go on kicking against the pricks. . . .



## CHAPTER VIII

1854

THE year 1854 marks the turning-point in Huxley's career. The desperate time of waiting came to an end. By the help of his lectures and his pen, he could at all events stand and wait independently of the Navy. He could not, of course, think of immediate marriage, nor of asking Miss Heathorn to join him in England; but it so happened that her father was already thinking of returning home, and finally this was determined upon just before Professor Forbes' translation to a chair at Edinburgh gave Huxley what turned out to be the long-hoped-for permanency in London.

*June 3, 1854.*

I have often spoken to you of my friend Edward Forbes. He has quite recently been suddenly appointed to a Professorial Chair in Edinburgh, vacated by the death of old Jamieson. He was obliged to go down there at once and lecture, and as he had just commenced his course at the Government School of Mines in Jermyn Street, it was necessary to obtain a substitute. He had spoken to me of the possibility of his being called away long ago, and had asked if I would take his place, to which, of course, I assented, but the whole affair was so uncertain that I never in any way reckoned upon it. Even at last I did not know on the Monday whether I was to go on for him on the Friday or not. However, he did go after giving two lectures, and on Friday the 25th May I took his lecture, and I have been going on ever since, twice a week on Mondays and Fridays. Called upon so very suddenly to give a course of some six and twenty lectures, I find it very hard work, but I like it and I never was in better health.

On July 20, this temporary work, which he had undertaken as the friend of Forbes, was exchanged for one of the permanent lectureships formerly held by the latter. A hundred a year for twenty-six lectures was not affluence; it would have suited him better to have had twice the work and twice the pay. But it was his crossing of the Rubicon, and, strangely enough, no sooner had he gained this success than it was doubled.

*July 30, 1854.*

I was appointed yesterday to a post of £200 a year. It has all come about in the strangest way. I told you how my friend Forbes had been suddenly called away to Edinburgh, and that I had suddenly taken his duties—sharp work it has been I can tell you these summer months, but it is over and done satisfactorily. Forbes got £500 a year, £200 for a double lectureship, £300 for another office. I took one of the lectureships, which would have given me £100 a year only, and another man was to have the second lectureship and the other office in question. It was so completely settled a week ago that I had written to the President of the Board of Trade who makes the appointment, accepting mine, and the other man had done the same. Happily for me, however, my new colleague was suddenly afflicted with a sort of moral colic, an absurd idea that he could not perform the duties of his office, and resigned it. The result is that a new man has been appointed to the office he left vacant, while the lectureship was offered to me. Of course I took it, and so in the course of the week I have seen my paid income doubled. . . . So after a short interval I have become a Government officer again, but in rather a different position I flatter myself. I am chief of my own department, and my position is considered a very good one—as good as anything of its kind in London.

Furthermore, on August 11 he was “entrusted with the Coast Survey investigations under the Geological Survey, and remunerated by fee until March 31, 1855, when he was ranked as Naturalist on the Survey with an additional salary of £200, afterwards increased to £400, rising to £600 per annum,” as the official statement has it.

Then in quick succession he was offered in August a lectureship on Comparative Anatomy at St. Thomas' Hospital for the following May and June, and in September he

was asked to lecture in November and March for the Science and Art Department at Marlborough House.

Now therefore, with the Heathorns coming to England, his plans and theirs exactly fitted, and he proposed to get married as soon as they came over, early in the following summer.

A letter of this year deserves quoting as illustrating the directness of Huxley's dealings with his friends, and his hatred of doing anything unknown to them which might be misreported to them or misconstrued without explanation. As a member of the Royal Society Council, it was his duty to vote upon the persons to whom the yearly medals of the Society should be awarded. For the Royal Medal first Hooker was named, and received his hearty support; then Forbes, in opposition to Hooker, in his eyes equally deserving of recognition, and almost more closely bound to him by ties of friendship, so that whatever action he took, might be ascribed to motives which should have no part in such a selection. The course actually taken by him he explained at length in letters to both Forbes and Hooker.

Nov. 6, 1854.

MY DEAR HOOKER—I have been so busy with lecturing here and there that I have not had time to write and congratulate you on the award of the medal. The queer position in which I was placed prevents me from being able to congratulate *myself* on having any finger in the pie, but I am quite sure there was no member of the Council who felt more strongly than myself that what honour the bauble could confer was most fully won, and no more than your just deserts; or who rejoiced more when the thing was settled in your favour.

However, I do trust that I shall never be placed in such an awkward position again. I would have given a great deal to be able to back Forbes tooth and nail—not only on account of my personal friendship and affection for him, but because I think he well deserves such recognition. And had I thought right to do so, I felt sure that you would have fully appreciated my motives, and that it would have done no injury to our friendship.

But as I told the Council I did not think this a case where either of you had any right to be excluded by the other. I told them that had Forbes been first named, I should have thought it

injudicious to bring you forward, and that, as you were named, I for my own part should not have brought forward Forbes as a candidate; that therefore while willing to speak up to any extent for Forbes' *positive* merits and deserts, I would carefully be understood to give no opinion as to your and his *relative* standing.

They did not take much by my speech therefore either way, more especially as I voted for *both* of you.

I hate doing anything of the kind "unbeknownst" to people, so there is the exact history of my proceedings. If I had been able to come to the clear conclusion that the claims of either of you were strongly superior to those of the other, I think I should have had the honesty and moral courage to "act accordin'," but I really had not, and so there was no part to play but that of a sort of Vicar of Bray.—Ever yours faithfully,

T. H. HUXLEY.

Forbes' reply was a letter which Huxley, after his friend's death, held "among his most precious possessions." It appeared without names in the obituary notice of Forbes in the *Literary Gazette* for November 25, 1854, as an example of his unselfish generosity:—

I heartily concur in the course you have taken, and had I been placed as you have been, would have done exactly the same. . . . Your way of proceeding was as true an act of friendship as any that could be performed. As to myself, I dream so little about medals, that the notion of being on the list never entered my brain, even when asleep. If it ever comes I shall be pleased and thankful; if it does not, it is not the sort of thing to break my equanimity. Indeed, I would always like to see it given not as a mere honour, but as a help to a good man, and this it is assuredly in Hooker's case. Government people are so ignorant that they require to have merits drummed into their heads by all possible means, and Hooker's getting the medal may be of real service to him before long. I am in a snug, though not an idle, nest,—he has not got his resting-place yet. And so, my dear Huxley, I trust that you know me too well to think that I am either grieved or envious, and you, Hooker, and I are much of the same way of thinking.

It is interesting to record the same scrupulosity over the election to the Registrarship of the University of London in 1856, when, having begun to canvass for Dr. Latham

before his friend Dr. W. B. Carpenter entered the field, he writes to Hooker:—

I at once, of course, told Carpenter precisely what I had done. Had I known of his candidature earlier, I should certainly have taken no active part on either side—not for Latham, because I would not oppose Carpenter, and not for Carpenter, because his getting the Registrarship would probably be an advantage for me, as I should have a good chance of obtaining the Examinership in Physiology and Comparative Anatomy which he would vacate. Indeed, I refused to act for Carpenter in a case in which he asked me to do so, partly for this reason and partly because I felt thoroughly committed to Latham. Under these circumstances I think you are quite absolved from any pledge to me. It's deuced hard to keep straight in this wicked world, but as you say the only chance is to out with it, and I thank you much for writing so frankly about the matter. I hope it will be as fine as to-day at Down.\*

Unfortunately the method was not so successful with smaller minds. Once in 1852, when he had to report unfavourably on a paper for the *Annals of Natural History* on the structure of the Starfishes, sent in by an acquaintance, he felt it right not to conceal his action, as he might have done, behind the referee's usual screen of anonymity, but to write a frank account of the reasons which had led him so to report, that he might both clear himself of the suspicion of having dealt an unfair blow in the dark, and give his acquaintance the opportunity of correcting and enlarging his paper with a view of submitting it again for publication.

In this case the only result was an impassioned correspondence, the author even going so far as to suggest that Huxley had condemned the paper without having so much as dissected an Echinoderm in his life! and then all intercourse ceased, till years afterwards the gentleman in question realised the weaknesses of his paper and repented him of his wrath.

Before leaving London to begin his work at Tenby as Naturalist to the Survey, he delivered at St. Martin's Hall, on July 22, an address on the "Educational Value of the

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\* Charles Darwin's home in Kent.

Natural History Sciences.\* This, when it came out later as a pamphlet, he sent to his Tenby friend Dr. Dyster (of whom hereafter), to whose criticism on one passage he replied on October 10:—

. . . —I am rejoiced you liked my speechment. It was written hastily and is, like its speaker, I fear, more forcible than eloquent, but it can lay claim to the merit of being sincere.

My intention on p. 28 was by no means to express any satisfaction at the worms being as badly off as ourselves, but to show that pain being everywhere is inevitable, and therefore like all other inevitable things to be borne. The rest of it is the product of my scientific Calvinism, which fell like a shell at your feet when we were talking over the fire.

I doubt, or at least I have no confidence in, the doctrine of ultimate happiness, and I am more inclined to look the opposite possibility fully in the face, and if that also be inevitable, make up my mind to bear it also.

You will tell me there are better consolations than Stoicism; that may be, but I do not possess them, and I have found my “grin and bear it” philosophy stand me in such good stead in my course through oceans of disgust and chagrin, that I should be loth to give it up.

The summer of 1854 was spent in company with the Busks at Tenby, amid plenty of open-air work and in great peace of mind, varied with a short visit to Liverpool in order to talk business with his friend Forbes, who was eager that Huxley should join him in Edinburgh.

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\* The subsequent reference is to the words, “I cannot but think that he who finds a certain proportion of pain and evil inseparably woven up in the life of the very worms will bear his own share with more courage and submission; and will, at any rate, view with suspicion those weakly amiable theories of the divine government, which would have us believe pain to be an oversight and a mistake, to be corrected by and by.” (*Collected Essays*, iii. p. 62.) This essay contains the definition of science as “trained and organised common sense,” and the reference to a new “Peter Bell” which suggested Miss May Kendall’s spirited parody of Wordsworth:—

Primroses by the river’s brim  
Dicotyledons were to him,  
And they were nothing more.

TENBY, SOUTH WALES, *Sept. 3, 1854.*

I have been here since the middle of August, getting rid of my yellow face and putting on a brown one, banishing dyspepsias and hypochondrias and all such other town afflictions to the four winds, and rejoicing exceedingly that I am out of the way of that pest, the cholera, which is raging just at present in London.

After I had arranged to come here to do a lot of work of my own which can only be done by the seaside, our Director, Sir Henry de la Beche, gave me a special mission of his own whereby I have the comfort of having my expenses paid, but at the same time get it taken out of me in additional labour, so my recreation is anything but leisure.

*Oct. 14.*

I left this place for a week's trip to Liverpool in the end of September. The meeting of the British Association was held there, but I went not so much to be present as to meet Forbes, with whom I wanted to talk over many matters concerning us both. Forbes had a proposition that I should go to Edinburgh to take part of the duties of the Professor of Physiology there, who is in bad health, with the ultimate aim of succeeding to the chair. It was a tempting offer made in a flattering manner, and presenting a prospect of considerably better emolument than my special post, but it had the disadvantage of being but an uncertain position. Had I accepted, I should have been at the mercy of the actual Professor—and that is a position I don't like standing in, even with the best of men, and had he died or resigned at any time the Scotch chairs are so disposed of that there would have been nothing like a certainty of my getting the post, so I definitely declined—I hope wisely.

After some talk, Forbes agreed with my view of the case, so he is off to Edinburgh, and I shall go off to London. I hope to remain there for my life long.

He had long felt that London gave the best opportunities for a scientific career, and it was on his advice that Tyndall had left Queenwood College for the Royal Institution, where he was elected Professor of Natural Philosophy in 1853:—

6 UPPER YORK PLACE, ST. JOHN'S WOOD,  
*Feb. 25, 1853.*

MY DEAR TYNDALL—Having rushed into more responsibility than I wotted of, I have been ruminating and taking counsel

what advice to give you. When I wrote I hardly knew what kind of work you had in your present office, but Francis has since enlightened me. I thought you had more leisure. One thing is very clear—you must come out of that. Your Pegasus is quite out of place ploughing. You are using yourself up in work that comes to nothing, and so far as I can see cannot be worse off.

Now what are your prospects? Why, as I told you before, you have made a *succès* here and must profit by it. The other night your name was mentioned at the Philosophical Club (the most influential scientific body in London) with great praise. Gassiot, who has great influence, said in so many words, "you had made your fortune," and I frankly tell you I believe so too, if you can only get over the next three years. So you see that *quoad* position, like Quintus Curtius, there is a "fine opening" ready for you, only mind you don't spoil it by any of your horrid modesty.

So much for glory—now for economics. I have been trying to ferret out more nearly your chances of a post, and here are my results (which, I need not tell you, must be kept to yourself).

At the Museum in Jermyn Street, Playfair, Forbes, Percy and I think Sir Henry would do anything to get you, and eliminate —; but, so far as I can judge, the probability of his going is so small that it is not worth your while to reckon upon it. Nevertheless it may be comforting to you to know that in case of anything happening these men will help you tooth and nail. Cultivate Playfair when you have a chance—he is a good fellow, wishes you well, has great influence, and will have more. *Entre nous*, he has just got a new and important post under Government.

Next, the Royal Institution. This is where, as I told you, you ought to be—looking to Faraday's place. Have no scruple about your chemical knowledge; you won't be required to train a college of students in abstruse analyses; and if you were, a year's work would be quite enough to put you at ease. What they want, and what you have, are *clear powers of exposition*—so clear that people may think they understand even if they don't. That is the secret of Faraday's success, for not a tithe of the people who go to hear him really understand him.

However, I am afraid that a delay must occur before you can get placed at the Royal Institution, as you cannot hold the Professorship until you have given a course of lectures there,



and it would seem that there is no room for you this year. However, I must try and learn more about this.

Under these circumstances the London Institution looks tempting. I have been talking over the matter with Forbes, whose advice I look upon as first-rate in all these things, and he is decidedly of the opinion that you should take the London Institution if it is offered you. He says that lecturing there and lecturing at other Institutions, and writing, you could with certainty make more than you at present receive, and that you would have the command of a capital laboratory and plenty of time.

Then as to position—of which I was doubtful—it appears that Grove has made it a good one.

It is of great importance to look to this point in London—to be unshackled by anything that may prevent you taking the highest places, and it was only my fear on this head that made me advise you to hesitate about the London Institution. More consideration leads me to say, take that, if it will bring you up to London at once, so that you may hammer your reputation while it is hot.

However, consider all these things well, and don't be hasty. I will keep eyes and ears open and inform you accordingly. Write to me if there is anything you want done, supposing always there is nobody who will do it better—which is improbable.—Ever yours,

T. H. HUXLEY.

But this year of victory was not to pass away without one last blow from fate. On November 18, Edward Forbes, the man in whom Huxley had found a true friend and helper, inspired by the same ideals of truth and sincerity as himself, died suddenly at Edinburgh. The strong but delicate ties that united them were based not merely upon intellectual affinity, but upon the deeper moral kinship of two strong characters, where each subordinated interest to ideal, and treated others by the measure of his own self-respect. As early as March 1851 he had written:—

I wish you knew my friend Prof. Forbes. He is the best creature you can imagine, and helps me in all manner of ways. A man of very great knowledge, he is wholly free from pedantry and jealousy, the two besetting sins of literary and scientific men. Up to his eyes in work, he never grudges his time if it is to help a friend. He is one of the few men I have ever met

to whom I can feel obliged, without losing a particle of independence or self-respect.

The following from a letter to Hooker, announcing Forbes' death, is a striking testimony to his worth:—

I think I have never felt so crushed by anything before. It is one of those losses which cannot be replaced either to the private friend or to science. To me especially it is a bitter loss. Without the aid and sympathy he has always given me from first to last, I should never have had the courage to persevere in the course I have followed. And it was one of my greatest hopes that we should work in harmony for long years at the aims so dear to us both.

But it is otherwise, and we who remain have nothing left but to bear the inevitable as we best may.

And again a few days later:—

I have had no time to write to you again till now, but I write to say how perfectly you express my own feeling about our poor friend. One of the first things I thought of was that medal business,\* and I never rejoiced in anything more than that I had not been deterred by any moral cowardice from acting as I did.

As it is I reckon that letter (which I will show you some day) among my most precious possessions.

Huxley's last tribute to his dead friend was the organising a memorial fund, part of which went to getting a bust of him made, part to establishing an Edward Forbes medal, to be competed for by the students of his old school in Jermyn Street.

As Huxley had been Forbes' successor at Jermyn Street, so now he seemed to many marked out to succeed him at Edinburgh. In November he writes to Hooker:—

People have been at me about the Edinburgh chair. If I could contrive to stop here, between you and I, I would prefer it to half a dozen Edinburgh chairs, but there is a mortal difference between £200 and £1000 a year. I have written to say that if the Professors can make up their minds they wish me to stand, I will—if not, I will not. For my own part, I believe my chances

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\* P. 119.

would be very small, and I think there is every probability of their dividing the chair, in which case I certainly would not go. However, I hate thinking about the thing.

And also to his sister:—

Nov. 26, 1854.

MY DEAREST LIZZIE—I feel I have been silent very long—a great deal too long—but you would understand if you knew how much I have to do; why, with every disposition to do otherwise, I now write hardly any but business letters. Even Nettie comes off badly I am afraid. When a man embarks as I have done, with nothing but his brains to back him, on the great sea of life in London, with the determination to *make* the influence and the position and the money which he hasn't got, you may depend upon it that the fierce wants and interests of his present and immediate circle leave him little time to think of anything else, whatever old loves and old memories may be smouldering as warmly as ever below the surface. So, sister mine, you must not imagine because I do not write that therefore I do not think of you or care to know about you, but only that I am eaten up with the zeal of my own house, and doing with all my heart the thing that the moment calls for.

The last year has been eventful for me. There is always a Cape Horn in one's life that one either weathers or wrecks one's self on. Thank God I think I may say I have weathered mine—not without a good deal of damage to spars and rigging though, for it blew deuced hard on the other side.

At the commencement of this year my affairs came to a crisis. The Government, notwithstanding all the representations which were made to them, would neither give nor refuse the grant for the publication of my work, and by way of cutting short all further discussion the Admiralty called upon me to serve. A correspondence ensued, in which, as commonly happens in these cases, they got the worst of it in logic and words, and I in reality and “tin.” They answered my syllogism by the irrelevant and absurd threat of stopping my pay if I did not serve at once. Here was a pretty business! However, it was no use turning back when so much had been sacrificed for one's end, so I put their Lordships' letter up on my mantelpiece and betook myself to scribbling for my bread. They, on the other hand, removed my name from the List. So there was an interregnum when I was no longer in Her Majesty's service. I had already joined the *Westminster Review*, and had inured myself

to the labour of translation—and I could get any amount of scientific work I wanted—so there was a living, though a scanty one, and amazingly hard work for it. My pen is not a very facile one, and what I write costs me a good deal of trouble.

In the spring of this year, however, a door opened. My poor lost friend Professor Forbes—whose steady attachment and aid had always been of the utmost service to me—was called to fill the chair of Natural History in Edinburgh at a moment's notice. It is a very valuable appointment, and he was obliged to fill it at once. Of course he left a number of vacancies behind, among them one at the Government School of Mines in Jermyn Street, where he lectured on Natural History. I was called upon to take up his lectures where he left off, in the same sudden way, and the upshot of it all was that I became permanently attached—with £200 a year pay. In other ways I can make a couple of hundred a year more even now, and I hope by-and-by to do better. In fact, a married man, as I hope soon to be, cannot live at all in the position which I ought to occupy under less than six hundred a year. If I keep my health, however, I have every hope of being able to do this—but, as the jockeys say, the pace is severe. Nettie is coming over in the spring, and if I have any luck at all, I mean to have paid off my debts and to be married by this time next year.\*

In the meanwhile, strangely enough—and very painfully for me—new possibilities have sprung up. My poor friend Forbes died only a week ago, just as he was beginning his course and entering upon as brilliant a career as ever was opened to any scientific man in this country.

I cannot tell you how deeply this has shocked me. I owe him so much, I loved him so well, and I have so very very few friends in the true sense of the word, that it has been perhaps

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\* He writes on July 21, 1851:—"I commenced life upon nothing at all, and I had to borrow in the ordinary way from an agent for the necessary expenses of my outfit. I sent home a great deal of money, but notwithstanding, from the beautiful way they have of accumulating interest and charges of one description and another, I found myself £100 in debt when I returned—besides something to my brother, about which, however, I do not suppose I need trouble myself just at present. As you may imagine, living in London, my pay now hardly keeps me, to say nothing of paying off my old scores. I could get no account of how things were going on with my agent while I was away, and therefore I never could tell exactly how I stood."

a greater loss to me than to any one—although there never was a man so widely lamented. One could trust him so thoroughly! However, he has gone, poor fellow, and there is nothing for it but to shut one's self up again—and I was only going to say that his death leaves his post vacant, and I have been strongly urged to become a candidate for it by several of the most influential Edinburgh Professors. I am greatly puzzled what to do. I do not want to leave London, nor do I think much of my own chances of success if I become a candidate—though others do. On the other hand, a stipend which varies between £800 and £1200 a year is not to be pooh-poohed.

We shall see. If I can carry out some arrangements which are pending with the Government to increase my pay to £400 a year, I shall be strongly tempted to stop in London. It is *the* place, the centre of the world.

In the meanwhile, as things always do come in heaps, I obtained my long-fought-for Grant—though indirectly—from the Government, which is, I think, a great triumph and vindication of the family motto—*tenax propositi*. Like many long-sought-for blessings, however, it is rather a bore now I have it, as I don't see how I am to find time to write the book. But things "do themselves" in a wonderful way. I'll tell you how many irons I have in the fire at this present moment:—(1) a manual of Comparative Anatomy for Churchill; (2) my "Grant" book; (3) a book for the British Museum people (half done); (4) an article for Todd's *Cyclopædia* (half done); (5) sundry memoirs on Science; (6) a regular Quarterly article in the *Westminster*; (7) lectures at Jermyn Street in the School of Mines; (8) lectures at the School of Art, Marlborough House; (9) lectures at the London Institution, and odds and ends. Now, my dearest Lizzie, whenever you feel inclined to think it unkind I don't write, just look at that list, and remember that all these things require strenuous attention and concentration of the faculties, and leave one not very fit for anything else. You will say that it is bad to be so entirely absorbed in these things, and to that I heartily say Amen!—but you might as well argue with a man who has just mounted the favourite for the "Oaks" that it is a bad thing to ride fast. He admits that, and is off like a shot when the bell rings nevertheless. My bell has rung some time, and thank God the winning-post is in sight.

Give my kindest regards to the doctor and special love to all the children. I send a trifle for my godson and some odds and

ends in the book line, among other things a Shakespeare for yourself, dear Liz.—Believe me, ever your affec. brother,  
T. H. HUXLEY.

In December the Edinburgh chair was practically offered to him undivided; but by that time the London authorities thought they had better make it worth his while to stay at Jermyn Street, and with negotiations begun for this end he refused to stand for Edinburgh. In the following spring, however, he was again approached from Edinburgh—not so much to withdraw his refusal and again become a candidate, as to let it be made known that he would accept the chair if it were offered him. But his position in London was now established; and he preferred to live in London on a bare sufficiency rather than to enjoy a larger income away from the centre of things.

Two letters to Tyndall, which refer to the division of labour in the science reviews for the *Westminster* (see p. 92), indicate very clearly the high pressure at which Huxley had already begun to work:—

TENBY, SOUTH WALES, Oct. 22, 1854.

MY DEAR TYNDALL—I was rejoiced to find you entertaining my proposition at all. No one believes how hard you work more than I, but I was not going to be such a bad diplomatist as to put that at the head of my letter, and if I had thought that what I want you to do involved any great accession thereto, I think I could not have mustered up the face to ask you. But really and truly, so long as it is confined to our own department it is no great affair. You make me laugh at the long face you pull about the duties, based on my phrase. The fact is, you notice what you like, and what you do not you leave undone, unless you get an editorial request to say something about a particular book. The whole affair is entirely in your own hands—at least it is in mine—as I went upon my principle of having a row at starting. . . .

Now here is an equitable proposition. Look at my work. I have a couple of monographs, odds and ends of papers for journals, a manual and some three courses of lectures to provide for this winter. “My necessities are as great as thine,” as Sir Philip Sidney didn’t say, so be a brick, split the difference, and

say you will be ready for the April number. I will write and announce the fact to Chapman.

What idiots we all are to toil and slave at this pace. I almost repent me of tempting you—after all—so I promise to hold on if you really think you will be overdoing it.

With you I envy Francis his gastric energies. I feel I have done for myself in that line, and am in for a life-long dyspeps. I have not, now, nervous energy enough for stomach and brain both, and if I work the latter, not even the fresh breezes of this place will keep the former in order. That is a discovery I have made here, and though highly instructive, it is not so pleasant as some other physiological results that have turned up.

Chapman, who died of cholera, was a distant relative of my man. The poor fellow vanished in the middle of an unfinished article, which has appeared in the last *Westminster*, as his forlorn vale! to the world. After all, that is the way to die, better a thousand times than drivelling off into eternity betwixt awake and asleep in a fatuous old age.—Believe me, ever yours faithfully,

T. H. HUXLEY.

On Tyndall consenting, he wrote again on the 29th:—

I rejoice in having got you to put your head under my yoke, and feel ready to break into a hand gallop on the strength of it.

I have written to Chapman to tell him you only make an experiment on your cerebral substance, whose continuance depends on tenacity thereof.

I didn't suspect you of being seduced by the magnificence of the emolument, you Cincinnatus of the laboratory. I only suggested that as pay sweetens labour, *a fortiori* it will sweeten what to you will be no labour.

I'm not a miserable mortal now—quite the contrary. I never am when I have too much to do, and my sage reflection was not provoked by envy of the more idle. Only I do wish I could sometimes ascertain the exact *juste milieu* of work which will suit, not my head or will, *these* can't have too much; but my absurd stomach.

The Edinburgh candidature, the adoption of his wider scheme for the carrying out of the coast survey, and his approaching marriage, are touched upon in the following letters to Dr. Frederick Dyster\* of Tenby, whose keen

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\* It was to Dyster that Huxley owed his introduction in 1854 to F. D. Maurice (whose work in educating the people he did his best to

interest in marine zoology was the starting-point of a warm friendship with the rising naturalist, some fifteen years his junior. He was strongly urged by the younger man to complete and systematise his observations by taking in turn all the species of each genus of annelids found at Tenby, and working them up into a series of little monographs "which would be the best of all possible foundations for a History of the British Annelidæ":—

TO DR. DYSTER

Jan. 5, 1855.

[He begins by confessing "a considerable liberty" he had been taking with Dyster's name, in calling a joint discovery of this, which he described in the *Edinburgh New Philosophical Journal*, *Protula Dysteri*.]

Are you very savage? If so, you must go and take a walk along the sands and see the slant rays of the sunset tipping the rollers as they break on the beach; that always made even *me* at peace with all the world, and *a fortiori* it will you.

Truly, I wish I had any such source of consolation. Chimney pots are highly injurious to my morals, and my temper is usually in proportion to the extent of my horizon.

I have been swallowing oceans of disgust lately. All sorts of squabbles, some made by my own folly and others by the malice of other people, and no great sea and sky to go out under, and be alone and forget it all.

You may have seen my name advertised by Reeve as about to write a memoir of poor Forbes, to be prefixed to a collection of his essays. I found that to be a mere bookseller's dodge on Reeve's part, and when I made the discovery, of course we had a battle-royal, and I have now wholly withdrawn from it.

I find, however, that one's kind and generous friends imagine it was an electioneering manœuvre on my part for Edinburgh. Imagine how satisfactory. I forget whether I told you that I had been asked to stand for Edinburgh and have done so. Whether I shall be appointed or not I do not know. So far as

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help), and later to Charles Kingsley, whom he first met at the end of June 1855. "What Kingsley do you refer to?" he writes on May 6, "*Alton Locke* Kingsley or *Photographic Kingsley*? I shall be right glad to find good men and true anywhere, and I will take your bail for any man. But the work must be critically done."



my own wishes go, I am in a curiously balanced state of mind about it. Many things make it a desirable post, but I dread leaving London and its freedom—its Bedouin sort of life—for Edinburgh and no whistling on Sundays. Besides, if I go there, I shall have to give up all my coast-survey plans, and all their pleasant concomitants.

*Apropos* of Edinburgh I feel much like the Irish hod-man who betted his fellow he could not carry him up to the top of a house in his hod. The man did it, but Pat turning round as he was set down on the roof, said, "Ye've done it, sure enough, but, bedad, I'd great hopes ye'd let me fall about three rounds from the top." Bedad, I'm nearly at the top of the Scotch ladder, but I've hopes.

It is finally settled that the chair will not be divided. I told them frankly I would not go if it were.

Has Highly sent your books yet?—Ever yours faithfully,  
T. H. HUXLEY.

JERMYN STREET, *Feb.* 13, 1855.

MY DEAR DYSTER— . . . I will do my best to help — to some alumni if the chance comes in my way, though, as you say, I don't like him. I can't help it. I respect piety, and hope I have some after my own fashion, but I have a profound prejudice against the efflorescent form of it. 'I never yet found in people thoroughly imbued with that pietism, the same notions of honour and straightforwardness that obtain among men of the world. It may be otherwise with —, but I can't help my pagan prejudice. So don't judge harshly of me thereanent.

About Edinburgh, I have been going to write to you for days past. I have decided on withdrawing from the candidature, and have done so. In fact the more I thought of it the less I liked it. They require nine months' lectures some four or five times a week, which would have thoroughly used me up, and completely put a stop to anything like original work; and then there was a horrid museum to be arranged, work I don't care about, and which would have involved an amount of intriguing and heart-burning, and would have required an amount of diplomacy to carry to a successful issue, for which my temper and disposition are wholly unfitted.

And then I felt above all things that it was for me an imposture. Here have I been fighting and struggling for years, sacrificing everything to be a man of science, a genuine worker,

and if I had obtained the Edinburgh chair, I should have been in reality a mere pedagogue and a man of science only in name. Such were my notions, and if I hesitated at all and allowed myself to become a candidate, it was only because I have other interests to consult than my own. Intending to "range myself" one of these days and become a respectable member of society, I was bound to consider my material interests. And so I should have been still a candidate for Edinburgh had not the Government here professed themselves unwilling to lose my services, adding the "material guarantee" of an addition to my income, which, though by no means bringing it up to the point of Edinburgh, will still enable me (*das heisst* "us") to live comfortably here.

I must renounce the "pomps and vanities," but all those other "lusts of the flesh" which may besem a gentleman may be reasonably gratified.

Don't you think I have been wise in my Hercules choice? After all I don't lay claim to any great merit, seeing it was anything but certain I should get Edinburgh.

The best of all is that I have every reason to believe that Government will carry out my scheme for a coast survey, so happily and pleasantly begun at Tenby last year.

The final arrangements are almost complete, and I believe you may make up your mind to have four months of me next year. Tenby shall be immortalised and Jenkyn\* converted into a philosopher. By the way, I think the best way would be to retain the shells till I come. My main purpose is to have in them a catalogue of what Tenby affords.

Pray give my kind remembrances to Mrs. Dyster, and believe me, ever yours,

T. H. HUXLEY.

*April 1, 1855.*

MY DEAR DYSTER—By all that's good, your last note, which lies before me, has date a month ago. I looked at it just now, and became an April fool on the instant.

All the winds of March, however, took their course through my thorax and eventuated in lectures. At least that is all the account I can give to myself of the time, and an unprofitable account it is, for everything but one's exchequer.

So far as knowledge goes it is mere prodigality spending

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\* Jenkyn was employed to collect shells, etc., at Tenby. He is often alluded to as "the Professor."

one's capital and adding nothing, for I find the physical exertion of lecturing quite unfits me for much else. Fancy how last Friday was spent. I went to Jermyn Street in the morning with the intention of preparing for my afternoon's lecture. People came talking to me up to within a quarter of an hour of the time, so I had to make a dash without preparation. Then I had to go home to prepare for a second lecture in the evening, and after that I went to a soirée, and got home about one o'clock in the morning.

I go on telling myself this won't do, but to no purpose.

You will be glad to hear that my affairs here are finally settled, and I am regularly appointed an officer of the survey with the commission to work out the natural history of the coast.

Edinburgh has been tempting me again, and in fact I believe I was within an ace of going there, but the Government definitely offering me this position, I was too glad to stop where I am.

I can make six hundred a year here, and that being the case, I conceive I have a right to consult my own inclinations and the interests of my scientific reputation. The coast survey puts in my hands the finest opportunities that ever a man had, and it is a pity if I do not make myself something better than a Caledonian pedagogue.

The great first scheme I have in connection with my new post is to work out the Marine Natural History of Britain, and to have every species of sea beast properly figured and described in the reports which I mean from time to time to issue. I can get all the engravings and all the printing I want done, but of course I am not so absurd as to suppose I can work out all these things myself. Therefore my notion is to seek in all highways and byways for fellow labourers. Busk will, I hope, supply me with figures and descriptions of the British Polyzoa and Hydrozoa, and I have confidence in my friend, Mr. Dyster of Tenby (are you presumptuous enough to say you know him?) for the Annelids, if he won't object to that mode of publishing his work. The Mollusks, the Crustaceans, and the Fishes, the Echinoderms and the Worms, will give plenty of occupation to the other people, myself included, to say nothing of distribution and of the recent geological changes, all of which come within my programme.

Did I not tell you it was a fine field, and could the land o' cakes give me any scope like this?

April 9, 1855.

MY DEAR DYSTER—I didn't by any means mean to be so sphinx-like in my letter, though you have turned out an Œdipus of the first water. True it is that I mean to "range myself," "live cleanly and leave off sack," within the next few months—that is to say, if nothing happen to the good ship which is at present bearing my fiancée homewards.

So far as a restless mortal—more or less weary of most things—like myself can be made happy by any other human being, I believe your good wishes are safe of realisation; at any rate, it will be my fault if they are not, and I beg you never to imagine that I could confound the piety of friendship with the "efflorescent" variety.

I hope to marry in July, and make my way down to Tenby shortly afterwards, and I am ready to lay you a wager that your vaticinations touching the amount of work that *won't* be done don't come true.

So much for wives—now for *worms*—(I could not for the life of me help the alliteration). I, as right reverend father in worms and Bishop of Annelidæ, do not think I ought to interfere with my most promising son, when a channel opens itself for the publication of his labours. So do what you will *apropos* of J—. If he does not do the worms any better than he did the zoophytes, he won't interfere with my plans.

I shall be glad to see Mrs. Buckland's Echinoderm. I think it must be a novelty by what you say. She is a very jolly person, but I have an unutterable fear of scientific women.—  
Ever yours,  
T. H. HUXLEY.

May 6, 1855.

My ship is not come home but is coming, and I have been in a state of desperation at the continuous east winds. However, to-day there is a westerly gale, and if it lasts I shall have news soon. You may imagine that I am in an unsatisfactory state of mind between this and lecturing five times a week.

I beg to say that the "goods" I expect are home produce transplanted (or sent a voyage as you do Madeira), and not foreign growth by any means. But it is five years since we met, I am another man altogether, and if my wife be as much altered, we shall need a new introduction. Correspondence, however active, is a poor substitute for personal communication and tells one but little of the inner life.

Finally, on the eve of his marriage in July, Tyndall congratulates him on being appointed to deliver the next course of Fullerian Lectures at the Royal Institution:—

The fates once seemed to point to our connection in a distant land: we are now colleagues at home, and I can claim you a my scientific brother. May the gods continue to drop fatness upon you, and may your next great step be productive of all the felicity which your warmest friends or your own rebellious heart can desire.

## CHAPTER IX

1855

MISS HEATHORN and her parents reached England at the beginning of May 1855, and took up their abode at 8 Titchfield Terrace, not far from Huxley's own lodgings and his brother's house. One thing, however, filled Huxley with dismay. Miss Heathorn's health had broken down utterly, and she looked at death's door. All through the preceding year she had been very ill; she had gone with friends, Mr. and Mrs. Wise, to the newly opened mining-camp at Bathurst, and she and Mrs. Wise were indeed the first women to visit it; returning to Sydney after rather a rough time, she caught a chill, and being wrongly treated by a doctor of the blood-letting, calomel-dosing school, she was reduced to a shadow, and only saved by another practitioner, who reversed the treatment just in time.

In his letters to her, Huxley had not at first realised the danger she had been in; and afterwards tried to keep her spirits up by a cheerful optimism that would only look forward to their joyful union and many years of unbroken happiness to atone for their long parting.

But the reality alarmed him. He took her to one of the most famous doctors of the day, as if merely a patient he was interested in. Then as one member of the profession to another, he asked him privately his opinion of the case. "I give her six months of life," said Æsculapius. "Well, six months or not," replied Huxley, "she is going to be my wife." The doctor was mightily put out. "You ought to have told me that before." Of course, the evasive answer in such a contingency was precisely what Huxley wished to

avoid. Happily another leading doctor held a much more favourable opinion, and said that with care her strength would come back, slowly but surely.

14 WAVERLEY PLACE, *Wednesday*.

MY DEAR HOOKER—My wife and I met again on Sunday last, and I have established herself, her father and mother, close by me here at 8 Titchfield Terrace, Regent's Park, and whenever you and Mrs. Hooker are in this part of the world, and can find time to call there, you will find her anything but surprised to see you.

God help me! I discover that I am as bad as any young fool who knows no better, and if the necessity for giving six lectures a week did not sternly interfere, I should be hanging about her ladyship's apron-strings all day. She is in very bad health, poor child, and I have some reason to be anxious, but I have every hope she will mend with care.

Oh this life! "atra cura," as old Thackeray has it, sits on all our backs and mingles with all our happiness. But if I go on talking in this way you will wonder what has come over my philosophership.—Ever yours,  
T. H. HUXLEY.

Black Care was still in the background, but had relaxed her hold upon him. His spirits rose to the old point of gaiety. He writes how he gives a lively lecture to his students, and in the midst of it Satan prompts him to crow or howl—a temptation happily resisted. He makes atrocious puns in bidding Hooker to the wedding, which took place on July 21.

JERMYN STREET, *July 6, 1855*.

MY DEAR HOOKER—I ought long since to have thanked you in Thomson's name as well as my own for your *Flora Indica*. Some day I promise myself much pleasure and profit from the digestion of the Introductory Essay, which is probably as much as my gizzard is competent to convert into nutrition.

I terminate my Baccalaureate and take my degree of M.A.-trimony (isn't that atrocious?) on Saturday, July 21. After the unhappy criminals have been turned off, there will be refreshment provided for the sheriffs, chaplain, and spectators. Will you come? Don't if it is a bore, but I should much like to have you there.

It was not a large party that assembled at the George Huxleys for the wedding, but all were life-long friends, including, besides the Fanning clan and Mrs. Griffiths, an old Australian ally, Hooker, Tyndall, and Dr. and Mrs. Carpenter. There was none present but felt that abundant happiness was at least well earned after eight years of trial, and still more that its best guarantee was the firm loyalty and devotion that had passed through so many dangers of absence and isolation, so many temptations to renounce the ideal course under stress of circumstance, only to emerge strengthened and ennobled by the stern discipline of much sacrifice.

Great as was his new happiness, he hardly stood in need of Darwin's word of warning: "I hope your marriage will not make you idle; happiness, I fear, is not good for work." Huxley could not sit idle for long. If he had no occupation on hand, something worth investigation—and thorough investigation—was sure to catch his eye. So he writes to Hooker from Tenby:—

15 ST. JULIAN'S TERRACE, TENBY,  
*Aug. 16, 1855.*

MY DEAR HOOKER—I am so near the end of the honeymoon that I think it can hardly be immodest if I emerge from private life and write you a letter, more particularly as I want to know something. I went yesterday on an expedition to see the remains of a forest which exists between tidemarks at a place called Amroth, near here.

So far as I can judge there can be no doubt that this really is a case of downward movement. The stools of the trees are in their normal position, and their roots are embedded and interwoven in a layer of stiff blue clay, which lies immediately beneath the superficial mud of the shore. Layers of leaves, too, are mixed up with the clay in other parts, and the bark of some of the trees is in perfect preservation. The condition of the wood is very curious. It is like very hard cheese, so that you can readily cut slices with a spade, and yet where more of the trunk has been preserved some parts are very hard. The trees are, I fancy, Beech and Oak. Could you identify slices if I were to send you some?

Now it seems to me that here is an opportunity one does not often have of getting some information about the action of



sea water on wood, and on the mode in which these vegetable remains may become embedded, etc. etc., and I want to get you to tell me where I can find information on submerged forests in general, so as to see to what points one can best direct one's attention, and to suggest any inquiries that may strike yourself.

I do not see how the stumps can occur in this position without direct sinking of the land, and that such a sinking should have occurred tallies very well with some other facts which I have observed as to the nature of the bottom at considerable depths here.

We had the jolliest cruise in the world by Oxford, Warwick, Kenilworth, Stratford, Malvern, Ross, and the Wye, though it *was* a little rainy, and though my wife's strength sadly failed at times.

Still she was on the whole much better and stronger than I had any right to expect, and although I get frightened every now and then, yet there can be no doubt that she is steadily though slowly improving. I have no fears for the ultimate result, but her amendment will be a work of time. We have really quite settled down into Darby and Joan, and I begin to regard matrimony as the normal state of man. It's wonderful how light the house looks when I come back weary with a day's boating to what it used to do.

I hope Mrs. Hooker is well and about again. Pray give her our very kind regards, and believe me, my dear Hooker, ever yours,  
T. H. HUXLEY.

At Tenby he stayed on through August and September, continuing his occupations of the previous summer, dredging up specimens for his microscope, and working partly for his own investigations, partly for the Geological Survey.

## CHAPTER X

1855-1858

UP to his appointment at the School of Mines, Huxley's work had been almost entirely morphological, dealing with the Invertebrates. His first investigations, moreover, had been directed not to species-hunting, but to working out the real affinities of little known orders, and thereby evolving a philosophical classification from the limbo of "Vermes" and "Radiata."

He had continued the same work by tracing homologies of development in other classes of animals, such as the Cephalous Mollusca, the Articulata, and the Brachiopods. On these subjects, also, he had a good deal of correspondence with other investigators of the same cast of mind, and even when he did not carry conviction, the impression made by his arguments may be judged from the words of Dr. Allman, no mean authority, in a letter of May 2, 1852:—

I have thought over your arguments again and again, and while I am the more convinced of their ingenuity, originality, and *strength*, I yet feel ashamed to confess that I too must exclaim "tenax propositi." When was it otherwise in controversy?

Other speculations arising out of these researches had been given to the public in the form of lectures, notably that on Animal Individuality at the Royal Institution in 1852.

But after 1854, Paleontology and administrative work began to claim much of the time he would willingly have bestowed upon distinctly zoological research. His lectures

on Natural History of course demanded a good deal of first-hand investigation, and not only occasional notes in his fragmentary journals, but a vast mass of drawings now preserved at South Kensington attest the amount of work he still managed to give to these subjects. But with the exception of the Hunterian Lectures of 1868, he only published one paper on Invertebrates as late as 1860; and only half a dozen, not counting the belated "Oceanic Hydrozoa," between 1856 and 1859. The essay on the Crayfish did not appear until after he had left Jermyn Street and Paleontology for South Kensington.

The "Method of Paleontology," published in 1856, was the first of a long series of papers dealing with fossil creatures, the description of which fell to him as Naturalist to the Geological Survey. By 1860 he had published twelve such papers, and by 1871 twenty-six more, or thirty-eight in sixteen years.

It was a curious irony of fate that led him into this position. He writes in his Autobiography that, when Sir Henry de la Beche, the Director-General of the Geological Survey, offered him the post Forbes vacated of Paleontologist and Lecturer on Natural History,

I refused the former point blank, and accepted the latter only provisionally, telling Sir Henry that I did not care for fossils, and that I should give up Natural History as soon as I could get a physiological post. But I held the office for thirty-one years, and a large part of my work has been paleontological.

Yet the diversion was not without great use. A wide knowledge of paleontology offered a key to many problems that were hotly debated in the years of battle following the publication of the *Origin of Species* in 1859, as well as providing fresh subject-matter for the lectures in which he continued to give the lay world the results of his thought.

On the administrative and official side he laid before himself the organisation of the resources of the Museum of Practical Geology as an educational instrument. This involved several years' work in the arrangement of the specimens, so as to illustrate the paleontological lectures, and the

writing of "introductions" to each section of the catalogue, which should be a guide to the students. The "Method of Paleontology" mentioned above served as the prefatory essay to the whole catalogue, and was reprinted in 1869 by the Smithsonian Institute of Washington under the title of *Principles and Methods of Paleontology*.

This work led to his taking a lively interest in the organisation of museums in general, whether private, such as Sir Philip Egerton's, which he visited in 1856; local, such as Warwick or Chester; or central, such as the British Museum or that at Manchester.

With regard to the British Museum, the question had arisen of removing the Natural History collections from the confined space and dusty surroundings of Great Russell Street. A first memorial on the subject had been signed, not only by many non-scientific persons, but also by a number of botanists, who wished to see the British Museum Herbarium, etc., combined with the more accessible and more complete collections at Kew. Owing apparently to official opposition, the Natural History sub-committee of the British Museum Trustees advised a treatment of the Botanical Department which commended itself to none of the leading botanists. Consequently a number of botanists and zoologists took counsel together and drew up a fresh memorial from the strictly scientific point of view. Huxley and Hooker took an active part in the agitation. "It is no use," writes the former to his friend, "putting any faith in the old buffers, hardened as they are in trespasses and sin." And again:—

I see nothing for it but for you and I to constitute ourselves into a permanent "Committee of Public Safety," to watch over what is being done and take measures with the advice of others when necessary. . . . As for — and *id genus omne*, I have never expected anything but opposition from them. But I don't think it is necessary to trouble one's head about such opposition. It may be annoying and troublesome, but if we are beaten by it we deserve to be. We shall have to wade through oceans of trouble and abuse, but so long as we gain our end, I care not a whistle whether the sweet voices of the scientific mob are with me or against me.

According to Huxley's views a complete system demanded a triple museum for each subject, Zoology and Botany, since Geology was sufficiently provided for in Jermyn Street—one typical or popular, "in which all prominent forms or types of animals or plants, recent or fossil, should be so displayed as to give the public an idea of the vast extent and variety of natural objects, to diffuse a general knowledge of the results obtained by science in their investigation and classification, and to serve as a general introduction to the student in Natural Science"; the second scientific, "in which collections of all available animals and plants and their parts, whether recent or fossil, and in a sufficient number of specimens, should be disposed conveniently for study, and to which should be exclusively attached an appropriate library, or collection of books and illustrations relating to science, quite independent of any general library"; the third economic, "in which economic products, whether zoological or botanical, with illustrations of the processes by which they are obtained and applied to use, should be so disposed as best to assist the progress of Commerce and the Arts." It demanded further a Zoological and a Botanical Garden, where the living specimens could be studied.

Some of these institutions existed, but were not under state control. Others were already begun—*e.g.* that of Economic Zoology at South Kensington; but the value of the botanical collections was minimised by want of concentration, while as to zoology "the British Museum contains a magnificent collection of recent and fossil animals, the property of the state, but there is no room for its proper display and no accommodation for its proper study. Its official head reports directly neither to the Government nor to the governing body of the institution. . . . It is true that the people stroll through the enormous collections of the British Museum, but the sole result is that they are dazzled and confused by the multiplicity of unexplained objects, and the man of science is deprived thrice a week of the means of advancing knowledge."

The agitation of 1859-60 bore fruit in due season, and

within twenty years the ideal here sketched was to a great extent realised, as any visitor to the Natural History Museum at South Kensington can see for himself.

The same principles are reiterated in his letter of January 25, 1868, to the Commissioners of the Manchester Natural History Society, who had asked his advice as to the erection of a museum. But to the principles he adds a number of most practical suggestions as to the actual structure of the building, which are briefly appended in abstract. The complement to this is a letter of 1872, giving advice as to a local museum at Chester, and one of 1859 describing the ideal catalogue for a geological museum.

Jan. 25, 1868.

The Commissioners of the Manchester  
Natural History Society.

*Scheme for a Museum.*

*Objects.*—1. The public exhibition of a collection of specimens large enough to illustrate all the most important truths of Natural History, but not so extensive as to weary and confuse ordinary visitors.

2. The accessibility of this collection to the public.

3. The conservation of all specimens not necessary for the purpose defined in (1) in a place apart.

4. The accessibility of all objects contained in the museum to the curator and to scientific students, without interference with the public or by the public.

5. Thorough exclusion of dust and dirt from the specimens.

6. A provision of space for workrooms, and, if need be, lecture-rooms.

*Principle.*—A big hall (350 × 40 × 30) with narrower halls on either side, lighted from the top. The central hall for the public, the others for the curators, etc. The walls, of arches upon piers about 15 ft. high, bearing on girders a gallery 5 ft. wide in the public room, and 3 ft. 6 in. in the curators'.

The cases should be larger below, 5 ft. deep, and smaller above, 2 ft. deep, with glass fronts to the public, and doors on the curators' side.

For very large specimens—*e.g.* a whale—the case could expand into the curators' part without encroaching on the public part, so as to keep the line of windows regular.

Specimens of the Vertebrata, illustrations of Physical Geography and Stratigraphical Geology, should be placed below.

The Invertebrata, Botanical and Mineralogical specimens in the galleries.

The partition to be continued above the galleries to the roof, thus excluding all the dust raised by the public.

Space for students should be provided in the curators' rooms.

Storage should be *ample*.

A museum of this size gives twice as much area for exhibition purposes as that offered by *all* the cases in the present museum.

ATHENÆUM CLUB, *Dec. 8, 1872.*

DEAR SIR—I regret that your letter has but just come into my hands, so that my reply cannot be in time for your meeting, which, I understand you to say, was to be held yesterday.

I have no hesitation whatever in expressing the opinion that, except in the case of large and wealthy towns (and even in their case primarily), a Local Museum should be exactly what its name implies, viz. "Local"—illustrating local Geology, local Botany, local Zoology, and local Archæology.

Such a museum, if residents who are interested in these sciences take proper pains, may be brought to a great degree of perfection and be unique of its kind. It will tell both natives and strangers exactly what they want to know, and possess great scientific interest and importance. Whereas the ordinary lumber-room of clubs from New Zealand, Hindoo idols, sharks' teeth, mangy monkeys, scorpions, and conch shells—who shall describe the weary inutility of it? It is really worse than nothing, because it leads the unwary to look for the objects of science elsewhere than under their noses. What they want to know is that their "America is here," as Wilhelm Meister has it.—Yours faithfully,

T. H. HUXLEY.

Alfred Walker, Esq., Nant-y-Glyn, Colwyn Bay.

TO THE REV. P. BRODIE OF WARWICK

JERMYN STREET, *Oct. 14, 1859.*

MY DEAR MR. BRODIE—I am sorry to say that I can as yet send you no catalogue of ours. The remodelling of our museum is only just completed, and only the introductory part of my catalogue is written. When it is printed you shall have an early copy.

If I may make a suggestion I should say that a catalogue of your museum for popular use should commence with a sketch of the topography and stratigraphy of the county, put into the most intelligible language, and illustrated by reference to mineral specimens in the cases, and to the localities where sections showing the superposition of such and such beds is to be seen. After that I think should come a list of the most remarkable and interesting fossils, with reference to the cases where they are to be seen; and under the head of each a brief popular account of the kind of animal or plant which the thing was when alive, its probable habits, and its meaning and importance as a member of the great series of successive forms of life.—Yours very faithfully,

T. H. HUXLEY.

The reorganisation of the course of studies at Jermyn Street, fully sketched out in the 1857 notebook, involved two very serious additions to his work over and above what was required of him by his appointment as Professor. He found his students to a great extent lacking in the knowledge of general principles necessary to the comprehension of the special work before them. To enable them to make the best use of his regular lectures, he offered them in addition a preliminary evening course of nine lectures each January, which he entitled "An Introduction to the Study of the Collection of Fossils in the Museum of Practical Geology." These lectures summed up what he afterwards named Physiography, together with a general sketch of fossils and their nature, the classification of animals and plants, their distribution at various epochs, and the principles on which they are constructed, illustrated by the examination of some animal, such as a lobster.

The regular lectures, fifty-seven in number, ran from February to April and from April to June, with fortnightly examinations during the latter period, six in number. I take the scheme from his notebook:—"After prolegomena, the physiology and morphology of lobster and dove; then through Invertebrates, Anodon, Actinia, and Vorticella Protozoa, to Molluscan types. Insects, then Vertebrates. Supplemented Paleontologically by the demonstrations of the selected types in the cases; twelve Paleozoic, twelve



Mesozoic and Cainozoic," by his assistants. "To make the course complete there should be added (1) A series of lectures on Species, practical discrimination and description, modification by conditions and distribution; (2) Lectures on the elements of Botany and Fossil Plants."

This reorganisation of his course went hand in hand with his utilisation of the Jermyn Street Museum for paleontological teaching, and all through 1857 he was busily working at the Explanatory Catalogue.

Moreover, in 1855 he had begun at Jermyn Street his regular courses of lectures to working men—lectures which impressed those qualified to judge as surpassing even his class lectures. Year after year he gave the artisans of his best, on the principle enunciated thus early in a letter of February 27, 1855, to Dyster—

I enclose a prospectus of some People's Lectures (*Popular Lectures* I hold to be an abomination unto the Lord) I am about to give here. I want the working classes to understand that Science and her ways are great facts for them—that physical virtue is the base of all other, and that they are to be clean and temperate and all the rest—not because fellows in black with white ties tell them so, but because these are plain and patent laws of nature which they must obey "under penalties."

I am sick of the dilettante middle class, and mean to try what I can do with these hard-handed fellows who live among facts. You will be with me, I know.

And again on May 6, 1855:—

I am glad your lectures went off so well. They were better attended than mine [the Preliminary Course], although in point of earnestness and attention my audience was all I could wish. I am now giving a course of the same kind to working men exclusively—one of what we call our series of "working men's lectures," consisting of six given in turn by each Professor. The theatre holds 600, and is crammed full.

I believe in the fustian, and can talk better to it than to any amount of gauze and Saxony; and to a fustian audience (but to that only) I would willingly give some when I come to Tenby.

The corresponding movement set going by F. D. Maurice also claimed his interest, and in 1857 he gave his

first address at the Working Men's College to an audience, as he notes, of some fifty persons, including Maurice himself.

Other work of importance was connected with the Royal Institution. He had been elected to deliver the triennial course as Fullerian Professor, and for his subject in 1856-57 chose Physiology and Comparative Anatomy; in 1858, the Principles of Biology.

He was extremely glad of the additional "grist to the mill" brought in by these lectures. As he wrote in 1890:—

I have good reason to know what difference a hundred a year makes when your income is not more than four or five times that. I remember when I was candidate for the Fullerian professorship some twenty-three years ago, a friend of mine asked a wealthy manager to support me. He promised, but asked the value of the appointment, and when told, said, "Well, but what's the use of a hundred a year to him?" I suppose he paid his butler that.

A further attempt to organise scientific work throughout the country and make its results generally known, dates from this time. Huxley, Hooker, and Tyndall had discussed, early in 1858, the possibility of starting a *Scientific Review*, which should do for science what the *Quarterly* or the *Westminster* did for literature. The scheme was found not to be feasible at the time, though it was revived in another form in 1860; so in the meanwhile it was arranged that science should be laid before the public every fortnight, through the medium of a scientific column in the *Saturday Review*. The following letter bears on this proposal:—

April 20, 1858.

MY DEAR HOOKER—Before the dawn of the proposal for the ever-memorable though not-to-be *Scientific Review*, there had been some talk of one or two of us working the public up for science through the *Saturday Review*. Maskelyne (you know him, I suppose) was the suggester of the scheme, and undertook to talk to the *Saturday* people about it.

I thought the whole affair had dropped through, but yesterday Maskelyne came to me and to Ramsay with definite proposals from the *Saturday* editor.

He undertakes to put in a scientific article in the intermediate part between Leaders and Reviews once a fortnight if we will supply him. He is not to mutilate or to alter, but to take what he gets and be thankful.

The writers to select their own subjects. Now the question is, Will seven or eight of us, representing different sciences, join together and undertake to supply at least one article in three months? Once a fortnight would want a minimum of six articles in three months, so that if there were six, each man must supply one.

Sylvester is talked of for Mathematics. I am going to write to Tyndall about doing Physics. Maskelyne and perhaps Frankland will take Chemistry and Mineralogy. You and I might do Biology; Ramsay, Geology; Smyth, Technology.

This looks to me like a very feasible plan, not asking too much of anyone, and yet giving all an opportunity of saying what he has to say.

Besides this the *Saturday* would be glad to get Reviews from us.

If all those mentioned agree to join, we will meet somewhere and discuss plans.

Let me have a line to say what you think, and believe me, ever yours faithfully,

T. H. HUXLEY.

In 1858 he read three papers at the Geological and two at the Linnean; he lectured (February 15) on Fish and Fisheries at South Kensington, and on May 21 gave a Friday evening discourse at the Royal Institution on "The Phenomena of Gemmation." He wrote an article for *Todd's Cyclopaedia*, on the *Tegumentary Organs*, an elaborate paper, as Sir M. Foster says, on a histological theme, to which, as to others of the same class on the Teeth and the *Corpuscula Tactus* (*Q. J. Micr. Sci.* 1853-4), he had been "led probably by the desire, which only gradually and through lack of fulfilment left him, to become a physiologist rather than a naturalist."

No less important was his more general work for science. Physiological study in England at this time was dominated by transcendental notions. To put first principles on a sound experimental basis was the aim of the new leaders of scientific thought. To this end Huxley made

two contributions in 1858—one on the general subject of the cell theory, the other on the particular question of the development of the skull. “In a striking ‘Review of the Cell Theory,’” says Sir M. Foster, “which appeared in the *British and Foreign Medical Review* in 1858, a paper which more than one young physiologist at the time read with delight, and which even to-day may be studied with no little profit, he, in this subject as in others, drove the sword of rational inquiry through the heart of conceptions, metaphysical and transcendental, but dominant.”

Of this article Professor E. Ray Lankester also writes:—

. . . Indeed it is a fundamental study in morphology. The extreme interest and importance of the views put forward in that article may be judged of by the fact that although it is forty years since it was published, and although our knowledge of cell structure has made immense progress during those forty years, yet the main contention of that article, viz. that cells are not the cause but the result of organisation—in fact, are, as he says, to the tide of life what the line of shells and weeds on the sea-shore is to the tide of the living sea—is even now being re-asserted, and in a slightly modified form is by very many cytologists admitted as having more truth in it than the opposed view and its later outcomes, to the effect that the cell is the unit of life in which and through which alone living matter manifests its activities.

The second was his Croonian Lecture of 1858, “On the Theory of the Vertebrate Skull,” in which he demonstrated from the embryological researches of Rathke and others, that after the first step the whole course of development in the segments of the skull proceeded on different lines from that of the vertebral column; and that Oken’s imaginative theory of the skull as modified vertebrae, logically complete down to a strict parallel between the subsidiary head-bones and the limbs attached to the spine, outran the facts of a definite structure common to all vertebrates which he had observed.\*

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\* “Following up Rathke, he strove to substitute for the then dominant fantastic doctrines of the homologies of the cranial elements advocated by Owen, sounder views based on embryological evidence.

With the demolition of Oken's theory fell the superstructure raised by its chief supporter, Owen, "archetype" and all.

It was undoubtedly a bold step to challenge thus openly the man who was acknowledged as the autocrat of science in Britain. Moreover, though he had long felt that on his own subjects he was Owen's master, to begin a controversy was contrary to his deliberate practice. But now he had the choice of submitting to arbitrary dictation or securing himself from further aggressions by dealing a blow which would weaken the authority of the aggressor. For the growing antagonism between him and Owen had come to a head early in the preceding year, when the latter, taking advantage of the permission to use the lecture-theatre at Jermyn Street for the delivery of a paleontological course, unwarrantably assumed the title of Professor of Paleontology at the School of Mines, to the obvious detriment of Huxley's position there. His explanations not satisfying the council of the School of Mines, Huxley broke off all personal intercourse with him.

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He exposed the futility of attempting to regard the skull as a series of segments, in each of which might be recognised all the several parts of a vertebra, and pointed out the errors of trusting to superficial resemblances of shape and position. He showed, by the history of the development of each, that, though both skull and vertebral column are segmented, the one and the other, after an early stage, are fashioned on lines so different as to exclude all possibility of regarding the detailed features of each as mere modifications of a type repeated along the axis of the body. 'The spinal column and the skull start from the same primitive condition, whence they immediately begin to diverge.' 'It may be true to say that there is a primitive identity of structure between the spinal or vertebral column and the skull; but it is no more true that the adult skull is a modified vertebral column than it would be to affirm that the vertebral column is modified skull.' This lecture marked an epoch in England in vertebrate morphology, and the views enunciated in it carried forward, if somewhat modified, as they have been, not only by Huxley's subsequent researches and by those of his disciples, but especially by the splendid work of Gegenbaur, are still, in the main, the views of the anatomists of to-day."—Sir M. FOSTER, Royal Society Obituary Notice of T. H. Huxley.

## CHAPTER XI

1857-1858

THROUGHOUT this period his health was greatly tried by the strain of his work and life in town. Headache! headache! is his repeated note in the early part of 1857, and in 1858 we find such entries as:—"Feb. 11.—Used up. Hypochondrical and bedevilled." "Ditto 12." "13.—Not good for much." "21.—Toothache, incapable all day." And again:—"March 30.—Voiceless." "31.—Missed lecture." And, "April 1.—Unable to go out." He would come in thoroughly used up after lecturing twice on the same day, as frequently happened, and lie wearily on one sofa; while his wife, whose health was wretched, matched him on the other. Yet he would go down to a lecture feeling utterly unable to deliver it, and, once started, would carry it through successfully—at what cost of nervous energy was known only to those two at home.

But there was another branch of work, that for the Geological Survey, which occasionally took him out of London, and the open-air occupation and tramping from place to place did him no little good. Thus, through the greater part of September and October 1856 he ranged the coasts of the Bristol Channel from Weston to Clovelly, and from Tenby to Swansea, preparing a "Report on the Recent Changes of Level in the Bristol Channel." "You can't think," he writes from Braunton on October 3, "how well I am, so long as I walk eight or ten miles a day and don't work too much, but I find fifteen or sixteen miles my limit for comfort."

For many years after this his favourite mode of recruit-

ing from the results of a spell of overwork was to take a short walking tour with a friend. In April 1857 he is off for a week to Cromer; in 1860 he goes with Busk and Hooker for Christmas week to Snowdon; another time he is manœuvred off by his wife and friends to Switzerland with Tyndall.

In Switzerland he spent his summer holidays both in 1856 and 1857, in the latter year examining the glaciers with Tyndall scientifically, as well as seeking pleasure by the ascent of Mont Blanc. As fruits of this excursion were published late in the same year, his "Letter to Mr. Tyndall on the Structure of Glacier Ice" (*Phil. Mag.* xiv. 1857), and the paper in the *Philosophical Transactions of the Royal Society*, which appeared—much against his will—in the joint names of himself and Tyndall. Of these he wrote in 1893 in answer to an inquiry on the subject:—

By the Observations on Glaciers I imagine you refer to a short paper published in *Phil. Mag.* that embodied results of a little bit of work of my own. The Glacier paper in the *Phil. Trans.* is essentially and in all respects Professor Tyndall's. He took up glacier work in consequence of a conversation at my table, and we went out to Switzerland together, and of course talked over the matter a good deal. However, except for my friend's insistence, I should not have allowed my name to appear as joint author, and I doubt whether I ought to have yielded. But he is a masterful man and over-generous.

And in a letter to Hooker he writes:—

By the way, you really must not associate me with Tyndall and talk about *our* theory. My sole merit in the matter (and for that I do take some credit) is to have set him at work at it, for the only suggestion I made, viz. that the veined structure was analogous to his artificial cleavage phenomena, has turned out to be quite wrong.

Tyndall fairly *made* me put my name to that paper, and would have had it first if I would have let him, but if people go on ascribing to me any share in his admirable work I shall have to make a public protest. All I am content to share is the row, if there is to be one.

The following letters to Hooker and Tyndall touch upon his Swiss trips of 1856 and 1857:—

BERNE, *Sept.* 3, 1856.

I send you a line hence, having forgotten to write from Interlaken, whence we departed this morning.

The Weissthor expedition was the most successful thing you can imagine. We reached the Riffelberg in 11½ hours, the first six being the hardest work I ever had in my life in the climbing way, and the last five carrying us through the most glorious sight I ever witnessed. During the latter part of the day there was not a cloud on the whole Monte Rosa range, so you may imagine what the Matterhorn and the rest of them looked like from the wide plain of névé just below the Weissthor. It was quite a new sensation, and I would not have missed it for any amount; and besides this I had an opportunity of examining the névé at a very great height. A regularly stratified section, several hundred feet high, was exposed on the Cima di Jazi, and I was convinced that the Weissthor would be a capital spot for making observations on the névé and on other correlative matters. There are no difficulties in the way of getting up to it from the Zermatt side, tough job as it is from Macugnaga, and we might readily rig a tent under shelter of the ridge. That would lick old Saussure into fits. All the Zermatt guides put the S. Theodul pass far beneath the Weissthor in point of difficulty; and you may tell Mrs. Hooker that they think the S. Theodul easier than the Monte Moro. The best of the joke was that I lost my way in coming down the Riffelberg to Zermatt the same evening, so that altogether I had a long day of it. The next day I walked from Zermatt to Visp (recovering Baedeker by the way), but my shoes were so knocked to pieces that I got a blister on my heel. Next day Voiture to Susten, and then over Gemmi to Kandersteg, and on Thursday my foot was so queer I was glad to get a retour to Interlaken. I found most interesting and complete evidences of old moraine deposits all the way down the Leuk valley into the Rhine valley, and I believe those little hills beyond Susten are old terminal moraines too. On the other side I followed moraines down to Frutigen, and great masses of glacial gravel with boulders, nearly to the Lake of Thun.

My wife is better, but anything but strong.

CHAMOUNIX, *Aug.* 16, 1857.

My wife sends me intelligence of the good news you were so kind as to communicate to her. I need not tell you how rejoiced I am that everything has gone on well, and that your



wife is safe and well. Offer her my warmest congratulations and good wishes. I have made one matrimonial engagement for Noel already, otherwise I would bespeak the hand of the young lady for him.

It has been raining cats and dogs these two days, so that we have been unable to return to our headquarters at the Montanvert which we left on Wednesday for the purpose of going up Mont Blanc. Tyndall (who has become one of the most active and daring mountaineers you ever saw—so that we have christened him “cat”); and our guide said the other day, “*Il va plus fort qu'un mouton. Il faut lui mettre une sonnette*”) had set his heart on the performance of this feat (of course with purely scientific objects), and had equally made up his mind not to pay five and twenty pounds for the gratification. So we had one guide and took two porters in addition as far as the Grands Mulets. He is writing to you, and will tell you himself what happened to those who reached the top—to wit, himself, Hirst, and the guide. I found that three days in Switzerland had not given me my Swiss legs, and consequently I remained at the Grands Mulets, all alone in my glory, and for some eight hours in a great state of anxiety, for the three did not return for about that period after they were due.

I was there on a pinnacle like St. Simon Stylites, and nearly as dirty as that worthy saint must have been, but without any of his other claims to angelic assistance, so that I really did not see, if they had fallen into a crevasse, how I was to help either them or myself. They came back at last, just as it was growing dusk, to my inexpressible relief, and the next day we came down here—such a set of dirty, sun-burnt, snow-blind wretches as you never saw.

We heartily wished you were with us. What we shall do next I neither know nor care, as I have placed myself entirely under Commodore Tyndall's orders; but I suppose we shall be three or four days more at the Montanvert, and then make the tour of Mont Blanc. I have tied up six pounds in one end of my purse, and when I have no more than that I shall come back. Altogether I don't feel in the least like the father of a family; no more would you if you were here. The habit of carrying a pack, I suppose, makes the “quiver full of arrows” feel light.

115 ESPLANADE, DEAL. *Sept.* 3, 1857.

MY DEAR TYNDALL—I don't consider myself returned until next Wednesday, when the establishment of No. 14 will reopen

on its accustomed scale of magnificence, but I don't mind letting you know I am in the flesh and safe back.

The tour round Mont Blanc was a decided success; in fact, I had only to regret you were not with me. The grand glacier of the Allée Blanche and the view of Mont Blanc from the valley of Aosta were alone worth all the trouble. I had only one wet day, and that I spent on the Brenon Glacier; for, in spite of all good resolutions to the contrary, I cannot resist poking into the glaciers whenever I have a chance. You will be interested in my results, which we shall soon, I hope, talk on together at length.

As I suspected, Forbes has made a most egregious blunder. What he speaks of and figures as the "structure" of the Brenon is nothing but a peculiar arrangement of *entirely superficial dirt bands, dependent on the structure, but not it*. The true structure is singularly beautiful and well marked in the Brenon, the blue veins being very close set, and of course wholly invisible from a distance of a hundred yards, which is less than that of the spot whence Forbes' view of the (supposed) structure is taken.

I saw another wonderful thing in La Brenon. About the middle of its length there is a step like this of about 20 or 30 feet in height. In the lower part (B) the structural planes are vertical; in the upper (A) they dip at a considerable angle. I thought I had found a case of unconformability, indicating a slip of one portion of the glacier over another, but when I came to examine the intermediate region (X) carefully, I found the structural planes at every intermediate angle, and consequently a perfect transition from the one to the other.

I returned by Aosta, the great St. Bernard, and the Col de Balme. Old Simond was quite affectionate in his discourse about you, and seemed quite unhappy because you would not borrow his money. He had received your remittance, and asked me to tell you so. He was distressed at having forgotten to get a certificate from you, so I said in mine I was quite sure you were well satisfied with him.

On our journey he displayed his characteristic qualities, *Je ne sais pas* being the usual answer to any topographical inquiries with a total absence of nerve, and a general conviction that distances were very great and that the weather would be bad. However, we got on very well, and I was sorry to part with him.

I came home by way of Neuchatel, paying a visit to the Pierre à Bôt, which I have long wished to see. My financial

calculations were perfect in theory, but nearly broke down in practice, inasmuch as I was twice obliged to travel first-class when I calculated on second. The result was that my personal expenses between Paris and London amounted to 1.50!! and I arrived at my own house hungry and with a remainder of a few centimes. I should think that your fate must have been similar.

Many thanks for writing to my wife. She sends her kindest remembrances to you.—Ever yours,  
T. H. H.

The year 1857 was the last in which Huxley apparently had time to go so far in journal-writing as to draw up a balance-sheet at the year's end of work done and work undone. Though he finds "as usual a lamentable difference between agenda and acta; many things proposed to be done not done, and many things not thought of finished," still there is enough noted to satisfy most energetic people. Mention has already been made of his lectures—sixty-six at Jermyn Street, twelve Fullerian, and as many more to prepare for the next year's course; seven to working men, and one at the Royal Institution, together with the rearrangement of specimens at the Jermyn Street Museum, and the preparation of the Explanatory Catalogue, which this year was published to the extent of the Introduction and the Tertiary collections. To these may be added examinations at the London University, where he had succeeded Dr. Carpenter as examiner in Physiology and Comparative Anatomy in 1856, reviews, translations, a report on Deep Sea Soundings, and ten scientific memoirs.

The most important of the unfinished work consists of the long-delayed *Oceanic Hydrozoa*, the *Manual of Comparative Anatomy*, and a report on Fisheries. The rest of the unfinished programme shows the usual commixture of technical studies in anatomy and paleontology, with essays on the philosophical and educational bearings of his work. On the one hand are memoirs of Daphnia, Nautilus, and the Herring, the affinities of the Paleozoic Crustacea, the Ascidian Catalogue and Positive Histology; on the other, the Literature of the Drift, a review of the present state of philosophical anatomy, and a scheme for arranging the

Explanatory Catalogue to serve as an introductory textbook to the Jermyn Street lectures and the paleontological demonstrations. Here, too, would fall a proposed "Letter on the Study of Comparative Anatomy," to do for those subjects what Henslow had done in his "Letter" for Botany.

In addition to the fact of his being forced to take up Paleontology, it was perhaps the philosophic breadth of view with which he regarded his subject at any time, and the desire of getting to the bottom of each subsidiary problem arising from it, that made him for many years seem constantly to spring aside from his own subject, to fly off at a tangent from the line in which he was assured of unrivalled success did he but devote to it his undivided powers. But he was prepared to endure the charge of desultoriness with equanimity. In part, he was still studying the whole field of biological science before he would claim to be a master in one department; in part, he could not yet tell to what post he might succeed when he left—as he fully expected to leave—the professorship at Jermyn Street.

One characteristic of his early papers should not pass unnoticed. This was his familiarity with the best that had been written on his subjects abroad as well as in England. Thoroughness in this respect was rendered easier by the fact that he read French and German with almost as much facility as his mother tongue. "It is true, of course, that scientific men read French and German before the time of Huxley; but the deliberate consultation of all the authorities available has been maintained in historical succession since Huxley's earliest papers, and was absent in the papers of his early contemporaries." \*

About this time his activity in several branches of science began to find recognition from scientific societies at home and abroad. In 1857 he was elected honorary member of the Microscopical Society of Giessen; and in the same year, of a more important body, the Academy of

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\* P. Chalmers Mitchell in *Natural Science*, August 1895.

Portrait from a Photograph by Maul and Polyblank, 1857.









Breslau (Imperialis Academia Cæsariana Naturæ Curiosorum). He writes to Hooker:—

14 WAVERLEY PLACE, *April 3, 1857.*

Having subsided from standing upon my head—which was the immediate causation of your correspondence about the co-extension Imp. Acad. Cæs., Nat. Cur. (don't I know their thundering long title well!)—I have to say that I was born on the 4th of May of the year 1825, whereby I have now more or less mis-spent thirty-one years and a bittock, nigh on thirty-two.

Furthermore, my *locus natalis* is Ealing, in the county of Middlesex. Upon my word, it is very obliging of the "curious naturals," and I must say wholly surprising and unexpected.

I shall hold up my head immensely to-morrow when (blessed be the Lord) I give my last Fullerian.

Among other things, I am going to take Cuvier's crack case of the 'Possum of Montmartre as an illustration of my views.

I wondered what had become of you, but the people have come talking about me this last lecture or two, so I supposed you had erupted to Kew.

My glacier article is out; tell me what you think of it some day.

I wrote a civil note to Forbes \* yesterday, charging myself with my crime, and I hope that is the end of the business.

My wife is mending slowly, and if she were here would desire to be remembered to you.

In December 1858 he became a Fellow of the Linnean, and the following month not only Fellow but Secretary of the Geological Society.

In 1858 also he was elected to the Athenæum Club under Rule 2, which provides that the committee shall yearly elect a limited number of persons distinguished in art, science, or letters. His proposer was Sir R. Murchison, who wrote:—

ATHENÆUM, *Jan. 26.*

MY DEAR HUXLEY—I had a success as to you that I never had or heard of before. Nineteen persons voted, and of these eighteen voted for you and no one against you. You, of course,

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\* Principal James Forbes, with whose theory of glaciers Huxley and Tyndall disagreed.

came in at the head of the poll; no other having, *i.e.* Cobden, more than eleven.—Yours well satisfied,

ROD. I. MURCHISON.

From this time forth he corresponded with many foreign men of science; in these years particularly with Victor Carus, Lacaze Duthiers, Kölliker, and de Quatrefages, in reference to their common interest in the study of the invertebrates.

At home, the year 1857 opened very brightly for Huxley with the birth of his first child, a son, on the eve of the New Year. A Christmas child, the boy was named Noel, and lived four happy years to be the very sunshine of home, the object of passionate devotion, whose sudden loss struck deeper and more ineffaceably than any other blow that befell Huxley during all his life.

As he sat alone that December night, in the little room that was his study in the house in Waverley Place, waiting for the event that was to bring him so much happiness and so much sorrow, he made a last entry in his journal, full of hope and resolution. In the blank space below follows a note of four years later, when "the ground seemed cut from under his feet," yet written with restraint and without bitterness.

December 31, 1856. . . . 1856-7-8 must still be "Lehrjahre" to complete training in principles of Histology, Morphology, Physiology, Zoology, and Geology by *Monographic Work* in each Department. 1860 will then see me well grounded and ready for any special pursuits in either of these branches.

It is impossible to map out beforehand how this must be done. I must seize opportunities as they come, at the risk of the reputation of desultoriness.

In 1860 I may fairly look forward to fifteen or twenty years "Meisterjahre," and with the comprehensive views my training will have given me, I think it will be possible in that time to give a new and healthier direction to all Biological Science.

To smite all humbugs, however big; to give a nobler tone to science; to set an example of abstinence from petty personal controversies, and of toleration for everything but lying; to be indifferent as to whether the work is recognised as mine or not, so long as it is done:—are these my aims? 1860 will show.

Willst du dir ein hübsch Leben zimmern,  
 Musst dich ans Vergangene nicht bekümmern;  
 Und wäre dir auch was Verloren,  
 Musst immer thun wie neugeboren.  
 Was jeder Tag will, sollst du fragen;  
 Was jeder Tag will, wird er sagen.  
 Musst dich an eigenem Thun ergötzen;  
 Was andere thun, das wirst du schätzen.  
 Besonders keinen Menschen hassen  
 Und das Übrige Gott überlassen.\*

Half-past ten at night.

Waiting for my child. I seem to fancy it the pledge that all these things shall be.

Born five minutes before twelve. Thank God. New Year's Day, 1857.

*Sept. 20, 1860.*

And the same child, our Noel, our first-born, after being for nearly four years our delight and our joy, was carried off by scarlet fever in forty-eight hours. This day week he and I had a great romp together. On Friday his restless head, with its bright blue eyes and tangled golden hair, tossed all day upon his pillow. On Saturday night the fifteenth, I carried him here into my study, and laid his cold still body here where I write. Here too on Sunday night came his mother and I to that holy leave-taking.

My boy is gone, but in a higher and a better sense than was in my mind when I wrote four years ago what stands above—I feel that my fancy has been fulfilled. I say heartily and without bitterness—Amen, so let it be.

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\* Wilt shape a noble life? Then cast  
 No backward glances to the past.  
 And what if something still be lost?  
 Act as new-born in all thou dost.  
 What each day wills, that shalt thou ask;  
 Each day will tell its proper task;  
 What others do, that shalt thou prize,  
 In thine own work thy guerdon lies.  
 This above all: hate none. The rest—  
 Leave it to God. He knoweth best.

## CHAPTER XII

1859-1860

THE programme laid down in 1857 was steadily carried out through a great part of 1859. Huxley published nine monographs, chiefly on fossil Reptilia, in the proceedings of the Geological Society and of the Geological Survey, one on the armour of crocodiles at the Linnean, and "Observations on the Development of some Parts of the Skeleton of Fishes," in the *Journal of Microscopical Science*.

Among the former was a paper on *Stagonolepis*, a creature from the Elgin beds, which had previously been ranked among the fishes. From some new remains, which he worked out of the stone with his own hands, Huxley made out that this was a reptile closely allied to the Crocodiles; and from this and the affinities of another fossil, *Hyperodapedon*, from neighbouring beds, determined the geological age to which the Elgin beds belonged. A good deal turned upon the nature of the scales from the back and belly of this animal, and a careful comparison with the scales of modern crocodiles—a subject till then little investigated—led to the paper at the Linnean already mentioned.

The paper on fish-development was mainly based upon dissections of the young of the stickleback. Fishes had been divided into two classes according as their tails had been developed evenly on either side of the line of the spine, which was supposed to continue straight through the centre of the tail, or lopsided, with one tail fin larger than the other. This investigation showed that the apparently even development was only an extreme case of lopsidedness, the

continuation of the "chorda," which gives rise to the spine, being at the top of the upper fin, and both fins being developed on the same side of it. Lopsidedness as such, therefore, was not to be regarded as an embryological character in ancient fishes; what might be regarded as such was the absence of a bony sheath to the end of the "chorda" found in the more developed fishes. Further traces of this bony structure were shown to exist, among other piscine resemblances, in the Amphibia. Finally the embryological facts now observed in the development of the bones of the skull were of great importance, "as they enable us to understand, on the one hand, the different modifications of the palato-suspensorial apparatus in fishes, and on the other hand the relations of the components of this apparatus to the corresponding parts in other *Vertebrata*," fishes, reptiles, and mammals presenting a well-marked series of gradations in respect to this point.

This part of the paper had grown out of the investigations begun for the essay on the Vertebrate Skull,\* just as that on Jacare and Caiman from inquiry into the scales of *Stagonolepis*.

Thus he was still able to devote most of his time to original research. But though in his letter of March 27, 1855, below, he says, "I never write for the Reviews now, as original work is much more to my taste," it appears from jottings in his 1859 notebook, such as "Whewell's *History of Scientific Ideas*, as a Peg on which to hang Cuvier article," that he again found it necessary to supplement his income by writing. He was still examiner at London University, and delivered six lectures on Animal Motion at the London Institution and another at Warwick. This lecture he had offered to give at the Warwick Museum as some recognition of the willing help he had received from the assistants when he came down to examine certain fossils there. On the way he visited Rolleston at Oxford. The knowledge of Oxford life gained from this and a later visit led him to write:—

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\* See p. 152.

The more I see of the place the more glad I am that I elected to stay in London. I see much to admire and like; but I am more and more convinced that it would not suit me as a residence.

Two more important points remain to be mentioned among the occupations of the year. In January Huxley was elected Secretary of the Geological Society, and with this office began a form of administrative work in the scientific world which ceased only with his resignation of the Presidency of the Royal Society in 1885.

Part of the summer Huxley spent in the North. On August 3 he went to Lamlash Bay in Arran. Here Dr. Carpenter had, in 1855, discovered a convenient cottage on Holy Island—the only one, indeed, on the island—well suited for naturalists; the bay was calm and suitable both for the dredge and for keeping up a vivarium. He proposed that either the Survey should rent the whole island at a cost of some £50, or, failing this, that he would take the cottage himself, if Huxley would join him for two or three seasons and share the expense. Huxley laid the plan before Sir R. Murchison, the head of the Survey, who consented to try the plan for a course of years, during three months in each year. “But,” he added, “keep it experimental; for there are no *useful* fisheries such as delight Lord Stanley.” Here, then, with an ascent of Goatfell for variety on the 21st, a month was passed in trawling, and experiments on the spawning of the herring appear to have been continued for him during the winter in Bute.

On the 29th Huxley left Lamlash for a trip through central and southern Scotland, continuing his geological work for the Survey; and wound up by attending the meeting of the British Association at Aberdeen, leaving his wife and the three children at Aberdour, on the Fifeshire coast.

From Aberdeen, where Prince Albert was President of the Association, Huxley writes on September 15:—

Owen's brief address on giving up the presidential chair was exceedingly good. . . . I shall be worked like a horse here. There are all sorts of new materials from Elgin, besides other things, and I daresay I shall have to speak frequently. In point

of attendance and money this is the best meeting the Association ever had. In point of science, we shall see. . . . Tyndall has accepted the Physical chair with us, at which I am greatly delighted.

In this connection the following letter to Tyndall is interesting:—

ABERDOUR, FIFE, N.B., *Sept.* 5, 1859.

MY DEAR TYNDALL—I met Faraday on Loch Lomond yesterday, and learned from him that you had returned, whereby you are a great sinner for not having written to me. Faraday told me you were all sound, wind and limb, and had carried out your object, which was good to hear.

Have you had any letter from Sir Roderick? If not, pray call in Jermyn Street and see Reeks\* as soon as possible.

The thing I have been hoping for for years past has come about,—Stokes having resigned the Physical Chair in our place, in consequence of his appointment to the Cambridge University Commission. This unfortunately occurred only after our last meeting for the session, and after I had left town, but Reeks wrote to me about it at once. I replied as soon as I received his letter, and told him that I would take upon myself the responsibility of saying that you would accept the chair if it were offered you. I thought I was justified in this by various conversations we have had; and, at any rate, I felt sure that it was better that I should get into a mess than that you should lose the chance.

I know that Sir Roderick has written to you, but I imagine the letter has gone to Chamounix, so pray put yourself into communication with Reeks at once.

You know very well that the having you with us at Jermyn Street is a project that has long been dear to my heart, partly on your own account, but largely for the interest of the school. I earnestly hope that there is no impediment in the way of your coming to us. How I am minded towards you, you ought to know by this time; but I can assure you that all the rest of us will receive you with open arms. Of that I am quite sure.

Let me have a line to know your determination. I am on tenterhooks till the thing is settled.

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\* Mr. Trenham Reeks, who died in 1879, was Registrar of the School of Mines, and Curator and Librarian of the Museum of Practical Geology.

Can't you come up this way as you go to Aberdeen?—Ever yours faithfully,

T. H. HUXLEY.

*P.S.*—I thought I might mention the Jermyn Street matter to Faraday privately, and did so. He seemed pleased that the offer had been made.

The acceptance of the lectureship at the School of Mines brought Tyndall into the closest contact with Huxley for the next nine years, until he resigned his lectureship in 1868 on succeeding Faraday as superintendent of the Royal Institution.

On September 17 he writes:—

Yesterday Owen and I foregathered in Section D. He read a very good and important paper, and I got up afterwards and spoke exactly as I thought about it, and praising many parts of it strongly. In his reply he was unco civil and complimentary, so that the people who had come in hopes of a row were (as I intended they should be) disappointed.

A number of miscellaneous letters of this period are here grouped together.

14 WAVERLEY PLACE, *Jan.* 30, 1858.

MY DEAR HOOKER— . . . I wish you wouldn't be apologetic about criticism from people who have a right to criticise. I always look upon any criticism as a compliment, not but what the old Adam in T. H. H. *will* arise and fight vigorously against all impugment, and irrespective of all odds in the way of authority, but that is the way of the beast.

Why I value your and Tyndall's and Darwin's friendship so much is, among other things, that you all pitch into me when necessary. You may depend upon it, however blue I may look when in the wrong, it's wrath with myself and nobody else.

#### TO HIS SISTER

THE GOVERNMENT SCHOOL OF MINES, JERMYN ST.,

*March* 27, 1858.

MY DEAREST LIZZIE—It is a month since your very welcome letter reached me. I had every inclination and every intention to answer it at once, but the wear and tear of incessant occupation (for your letter arrived in the midst of my busiest time) has, I will not say deprived me of the leisure, but of that tone of mind which one wants for writing a long letter. I fully



understand—no one should be better able to comprehend—how the same causes may operate on you, but do not be silent so long again; it is bad for both of us. I have loved but few people in my life, and am not likely to care for any more unless it be my children. I desire therefore rather to knit more firmly than to loosen the old ties, and of these which is older or stronger than ours? Don't let us drift asunder again.

Your letter came just after the birth of my second child, a little girl. I registered her to-day in the style and title of Jessie Oriana Huxley. The second name is a family name of my wife's and not, as you might suppose, taken from Tennyson. You will know why my wife and I chose the first. We could not make you a godmother, as my wife's mother is one, and a friend of ours had long since applied for the other vacancy, but perhaps this is a better tie than that meaningless formality. My little son is fifteen months old; a fair-haired, blue-eyed, stout little Trojan, very like his mother. He looks out on the world with bold confident eyes and open brow, as if he were its master. We shall try to make him a better man than his father. As for the little one, I am told she is pretty, and slavishly admit the fact in the presence of mother and nurse, but between ourselves I don't see it. To my carnal eyes her nose is the image of mine, and you know what that means. For though wandering up and down the world and work have begun to sow a little silver in my hair, they have by no means softened the outlines of that remarkable feature.

You want to know what I am and where I am—well, here's a list of titles. T. H. H., Professor of Natural History, Government School of Mines, Jermyn Street; Naturalist to the Geological Survey; Curator of the Paleontological collections (*non-official* maid-of-all-work in Natural Science to the Government); Examiner in Physiology and Comparative Anatomy to the University of London; Fullerian Professor of Physiology to the Royal Institution (but that's just over); F.R.S., F.G.S., etc. Member of a lot of Societies and Clubs, all of which cost him a mint of money. Considered a rising man and not a bad fellow by his friends—*per contra* greatly over-estimated and a bitter savage critic by his enemies. Perhaps they are both right. I have a high standard of excellence and am no respecter of persons, and I am afraid I show the latter peculiarity rather too much. An internecine feud rages between Owen and myself (more's the pity) partly on this account, partly from other causes.

This is the account any third person would give you of what I am and of what I am doing. He would probably add that I was very ambitious and desirous of occupying a high place in the world's estimation. Therein, however, he would be mistaken. An income sufficient to place me above care and anxiety, and free scope to work, are the only things I have ever wished for or striven for. But one is obliged to toil long and hard for these, and it is only now that they are coming within my grasp. I gave up the idea of going to Edinburgh because I doubted whether leaving London was wise. Recently I have been tempted to put up for a good physiological chair which is to be established at Oxford; but the Government propose to improve my position at the School of Mines, and there is every probability that I shall now permanently remain in London. Indeed, it is high time that I should settle down to one line of work. Hitherto, as you see by the somewhat varied list of my duties, etc., above, I have been ranging over different parts of a very wide field. But this apparent desultoriness has been necessary, for I knew not for what branch of science I should eventually have to declare myself. There are very few appointments open to men of science in this country, and one must take what one can get and be thankful.

My health was very bad some years ago, and I had great fear of becoming a confirmed dyspeptic, but thanks to the pedestrian tours in the Alps I have taken for the past two years, I am wonderfully better this session, and feel capable of any amount of work. It was in the course of one of these trips that I went, as you have rightly heard, half way up Mont Blanc. But I was not in training and stuck at the Grands Mulets, while my three companions went on. I spent seventeen hours alone on that grand pinnacle, the latter part of the time in great anxiety, for I feared my friends were lost; and as I had no guide my own neck would have been in considerable jeopardy in endeavouring to return amidst the maze of crevasses of the Glacier des Bois. But it was glorious weather and the grandest scenery in the world. In the previous year I saw much of the Bernese and Monte Rosa country, journeying with a great friend of mine well known as a natural philosopher, Tyndall, and partly seeking health and partly exploring the glaciers. You will find an article of mine on that subject in the *Westminster Review* for 1857.

I used at one time to write a good deal for that Review, principally the Quarterly notice of scientific books. But I never write for the Reviews now, as original work is much more to

my taste. The articles you refer to are not mine, as, indeed, you rightly divined. The only considerable book I have translated is Kölliker's *Histology*—in conjunction with Mr. Busk, an old friend of mine. All translation and article writing is weary work, and I never do it except for filthy lucre. Lecturing I do not like much better; though one way or another I have to give about sixty or seventy a year.

Now then, I think that is enough about my "Ich." You shall have a photographic image of him and my wife and child as soon as I can find time to have them done. . . .

1 ELDON PLACE, BROADSTAIRS, *Sept.* 5, 1858.

MY DEAR HOOKER—I am glad Mrs. Hooker has found rest for the sole of her foot. I returned her Tyndall's letter yesterday.

Wallace's impetus seems to have set Darwin going in earnest, and I am rejoiced to hear we shall learn his views in full, at last. I look forward to a great revolution being effected. Depend upon it, in natural history, as in everything else, when the English mind fully determines to work a thing out, it will do it better than any other.

I firmly believe in the advent of an English epoch in science and art, which will lick the Augustan (which, by the bye, had neither science nor art in our sense, but you know what I mean) into fits. So hooray, in the first place, for the *Genera plantarum*. I can quite understand the need of a new one, and I am right glad you have undertaken it. It seems to me to be in all respects the sort of work for you, and exactly adapted to your environment at Kew. I remember you mentioned to me some time ago that you were thinking of it.

I wish I could even hope that such a thing would be even attempted in the course of this generation for animals.

But with animal morphology in the state in which it is now, we have no terminology that will stand, and consequently concise and comparable definitions are in many cases impossible.

If old Dom. Gray \* were but an intelligent activity instead of being a sort of zoological whirlwind, what a deal he might do. And I am hopeless of Owen's comprehending what classification means since the publication of the wonderful scheme which adorns the last edition of his lectures.

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\* John Edward Gray (1800-1875), appointed Keeper of the Zoological Collections in the British Museum in 1840.

As you say, I have found this a great place for "work of price." I have finished the "Oceanic Hydrozoa" all but the bookwork, for which I must have access to the B.M. Library—but another week will do him. My notes are from eight to twelve years old, and really I often have felt like the editor of somebody else's posthumous work.

Just now I am busy over the "Croonian," which must be done before I return. I have been pulling at all the arguments as a spider does at his threads, and I think they are all strong. If so the thing will do some good.

I am perplexed about the N.H. Collections. The best thing, I firmly believe, would be for the Economic Zoology and a set of well selected types to go to Kensington, but I should be sorry to see the scientific collection placed under any such auspices as those which govern the "Bilers." I don't believe the clay soil of the Regent's Park would matter a fraction—and to have a grand scientific zoological and paleontological collection for working purposes close to the Gardens where the living beasts are, would be a grand thing. I should not wonder if the affair is greatly discussed at the B.A. at Leeds, and then, perhaps, light will arise.

Have you seen that madcap Tyndall's letter in the *Times*? He'll break his blessed neck some day, and that will be a great hole in the efficiency of my scientific young England. We mean to return next Saturday, and somewhere about the 16th or 17th I shall go down to York, where I want to study Plesiosaurs. I shall return after the British Association. The interesting question arises, Shall I have a row with the Great O. there? What a capital title that is they give him of the *British Cuvier*. He stands in exactly the same relation to the French as British brandy to cognac.—Ever yours faithfully, T. H. HUXLEY.

Am I to send the *Gardener's Chronicle* on, and where? please. I have mislaid the address.

JERMYN STREET, Oct. 25, 1858.

MY DEAR SPENCER—I read your article on the "Archetype" the other day with great delight, particularly the phrase which puts the Owenian and Cummingian interpolations on the same footing. It is rayther strong, but quite just.

I do not remember a word to object to, but I think I could have strengthened your argument in one or two places. Having eaten the food, will you let me have back the dish? I am wind-

ing up the "Croonian," and want *L'Archetype* to refer to. So if you can let me have it I shall be obliged. When do you return?—Ever yours faithfully,  
T. H. HUXLEY.

14 WAVERLEY PLACE, Jan. 1, 1859.

MY DEAREST LIZZIE—If intentions were only acts, the quantity of letter paper covered with my scrawl which you would have had by this time would have been something wonderful. But I live at high pressure, with always a number of things crying out to be done, and those that are nearest and call loudest get done, while the others, too often, don't. However, this day shall not go by without my wishing you all happiness in the new year, and that wish you know necessarily includes all belonging to you, and my love to them.

I have been long wanting to send you the photographs of myself, wife, and boy, but one reason or other (Nettie's incessant ill-health being, I am sorry to say, the chief) has incessantly delayed the procuring of the last. However, at length, we have obtained a tolerably successful one, though you must not suppose that Noel has the rather washed out look of his portrait. That comes of his fair hair and blue gray eyes—for the monkey is like his mother and has not an atom of resemblance to me.

He was two years old yesterday, and is the apple of his father's eye and chief deity of his mother's pantheon, which at present contains only a god and goddess. Another is expected shortly, however, so that there is no fear of Olympus looking empty.

. . . Here is the 26th of January and no letter gone yet. . . Since I began this letter I have been very busy with lectures and other sorts of work, and besides, my whole household almost has been ill—chicks with whooping cough, mother with influenza, a servant ditto. I don't know whether you have such things in Tennessee.

Let me see what has happened to me that will interest you since I last wrote. Did I tell you that I have finally made up my mind to stop in London—the Government having made it worth my while to continue in Jermyn Street? They give me £600 a year now, with a gradual rise up to £800, which I reckon as just enough to live on if one keeps very quiet. However, it is the greatest possible blessing to be paid at last, and to be free from all the abominable anxieties which attend a fluctuating income. I can tell you I have had a sufficiently hard fight of it.

When Nettie and I were young fools we agreed we would marry whenever we had £200 a year. Well, we have had more than twice that to begin upon, and how it is we have kept out of the Berich is a mystery to me. But we *have*, and I am inclined to think that the Missus has got a private hoard (out of the puddings) for Noel.

I shall leave Nettie to finish this rambling letter. In the meanwhile, my best love to you and yours, and mind you are a better correspondent than your affectionate brother, TOM.

### TO PROFESSOR LEUCKART

THE GOVERNMENT SCHOOL OF MINES,  
JERMYN STREET, LONDON, *January 30, 1859.*

MY DEAR SIR—Our mutual friend, Dr. Harley, informs me that you have expressed a wish to become possessed of a separate copy of my lectures, published in the *Medical Times*. I greatly regret that I have not one to send you. The publisher only gave me half a dozen separate copies of the numbers of the journal in which the Lectures appeared. Of these I sent one to Johannes Müller and one to Professor Victor Carus, and the rest went to other friends.

I am sorry to say that a mere fragment of what I originally intended to have published has appeared, the series having been concluded when I reached the end of the Crustacea. To say truth, the Lectures were not fitted for the journal in which they appeared.

I did not know that anyone in Germany had noticed them until I received the copy of your *Bericht* for 1856, which you were kind enough to send me. I owe you many thanks for the manner in which you speak of them, and I assure you it was a source of great pleasure and encouragement to me to find so competent a judge as yourself appreciating and sympathising with my objects.

Particular branches of zoology have been cultivated in this country with great success, as you are well aware, but ten years ago I do not believe that there were half a dozen of my countrymen who had the slightest comprehension of morphology, and of what you and I should call "Wissenschaftliche Zoologie."

Those who thought about the matter at all took Owen's osteological extravaganzas for the *ne plus ultra* of morphological speculation.

I learned the meaning of Morphology and the value of de-

velopment as the criterion of morphological views—first, from the study of the Hydrozoa during a long voyage, and secondly, from the writings of Von Bär. I have done my best, both by precept and practice, to inaugurate better methods and a better spirit than had long prevailed. Others have taken the same views, and I confidently hope that a new epoch for zoology is dawning among us. I do not claim for myself any great share in the good work, but I have not flinched when there was anything to be done.

Under these circumstances you will imagine that it was very pleasant to find on your side a recognition of what I was about.

I sent you, through the booksellers, some time ago a copy of my memoir on *Aphis*. I find from Moleschott's *Untersuchungen* that you must have been working at this subject contemporaneously with myself, and it was very satisfactory to find so close a concordance in essentials between our results. Your memoirs are extremely interesting, and to some extent anticipated results at which my friend, Mr. Lubbock\* (a very competent worker, with whose paper on *Daphnia* you are doubtless acquainted), had arrived.

I should be very glad to know what you think of my views of the composition of the articulate head.

I have been greatly interested also in your Memoir on *Pentastomum*. There can be no difficulty about getting a notice of it in our journals, and, indeed, I will see to it myself. Pray do me the favour to let me know whenever I can serve you in this or other ways.

I shall do myself the pleasure of forwarding to you immediately, through the booksellers, a lecture of mine on the Theory of the Vertebrate Skull, which is just published, and also a little paper on the development of the tail in fishes.

I am sorry to say that I have but little time for working at these matters now, as my position at the School of Mines obliges me to confine myself more and more to Palæontology.

However, I keep to the anatomical side of that sort of work, and so, now and then, I hope to emerge from amidst the fossils with a bit of recent anatomy.

Just at present, by the way, I am giving my disposable hours to the completion of a monograph on the Calycophoridae and Physophoridae observed during my voyage. The book ought to have been published eight years ago. But for three years I could

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\* The present Sir John Lubbock, M.P.

get no money from the Government, and in the meanwhile you and Kölliker, Gegenbaur and Vogt, went to the shores of the Mediterranean and made sad havoc with my novelties. Then came occupations consequent on my appointment to the chair I now hold; and it was only last autumn that I had leisure to take up the subject again.

However, the plates, which I hope you will see in a few months have, with two exceptions, been engraved five years.

Pray make my remembrances to Dr. Eckhard. I was sorry not to have seen him again in London.—Ever, my dear Sir, very faithfully yours,

T. H. HUXLEY.

Prof. Leuckart.

At this time Sir J. Hooker was writing, as an introduction to his *Flora of Tasmania*, his essay on the *Flora of Australia*, published in 1859—a book which owed its form to the influence of Darwin, and in return lent weighty support to evolutionary theory from the botanical side. He sent his proofs for Huxley to read.

14 WAVERLEY PLACE, N.W., *April 22, 1859.*

MY DEAR HOOKER—I have read your proofs with a great deal of attention and interest. I was greatly struck with the suggestions in the first page, and the exposure of the fallacy “that cultivated forms recur to wild types if left alone.” is new to me and seems of vast importance.

The argument brought forward in the note is very striking and as simple as the egg of Columbus, when one sees it. I have marked one or two passages which are not quite clear to me. . . .

I have been accused of writing papers composed of nothing but heads of chapters, and I think you tend the same way. Please take the trouble to make the two lines I have scored into a paragraph, so that poor devils who are not quite so well up in the subject as yourself may not have to rack their brains for an hour to supply all the links of your chain of argument. . . .

You see that I am in a carping humour, but the matter of the essays seems to me to be so very valuable that I am jealous of the manner of it.

I had a long visit from Greene of Cork yesterday. He is very Irish, but very intelligent and well-informed, and I am in hopes he will do good service. He is writing a little book on the Protozoa, which (so far as I have glanced over the proof



sheets as yet) seems to show a very philosophical turn of mind. It is very satisfactory to find the ideas one has been fighting for beginning to take root.

I do not suppose my own personal contributions to science will ever be anything very grand, but I shall be well content if I have reason to believe that I have done something to stir up others.—Ever yours faithfully,  
T. H. HUXLEY.

To the same :—

*April, 1859.*

MY DEAR HOOKER . . . I pity you—as for the MSS. it is one of those cases for which penances were originally devised. What do you say to standing on your head in the garden for one hour per diem for the next week? It would be a relief. . . .

I suppose you will be at the Phil. Club next Monday. In the meanwhile don't let all the flesh be worried off your bones (there isn't much as it is).—Ever yours faithfully,  
T. H. HUXLEY.

14 WAVERLEY PLACE, *July 29, 1859.*

MY DEAR HOOKER—I meant to have written to you yesterday, but things put it out of my head. If there is to be any fund raised at all, I am quite of your mind that it should be a scientific fund and not a mere naturalists' fund. Sectarianism in such matters is ridiculous, and besides that, in this particular case it is bad policy. For the word "Naturalist" unfortunately includes a far lower order of men than chemist, physicist, or mathematician. You don't call a man a mathematician because he has spent his life in getting as far as quadratics; but every fool who can make bad species and worse genera is a "Naturalist"!—save the mark! Imagine the chemists petitioning the Crown for a Pension for P—— if he wanted one! and yet he really is a philosopher compared to poor dear A——.

"Naturalists" therefore are far more likely to want help than any other class of scientific men, and they would be greatly damaging their own interests if they formed an exclusive fund for themselves.—Ever yours faithfully,  
T. H. HUXLEY.

## CHAPTER XIII

1859

IN November 1859 the *Origin of Species* was published, and a new direction was given to Huxley's activities. Ever since Darwin and Wallace had made their joint communication to the Linnean Society in the preceding July, expectation had been rife as to the forthcoming book. Huxley was one of the few privileged to learn Darwin's argument before it was given to the world; but the greatness of the book, mere instalment as it was of the long accumulated mass of notes, almost took him by surprise. Before this time, he had taken up a thoroughly agnostic attitude with regard to the species question, for he could not accept the creational theory, yet sought in vain among the transmutationists for any cause adequate to produce transmutation. He had had many talks with Darwin, and though ready enough to accept the main point, maintained such a critical attitude on many others, that Darwin was not by any means certain of the effect the published book would produce upon him. Indeed, in his 1857 notebook, I find jotted down under the head of his paper on *Pygocephalus* (read at the Geological Society), "anti-progressive confession of faith." Darwin was the more anxious, as, when he first put pen to paper, he had fixed in his mind three judges, by whose decision he determined mentally to abide. These three were Lyell, Hooker, and Huxley. If these three came round, partly through the book, partly through their own reflections, he could feel that the subject was safe. "No one," writes Darwin on November 13, "has read it, except Lyell, with whom I have had much correspondence.

Hooker thinks him a complete convert, but he does not seem so in his letters to me; but is evidently deeply interested in the subject." And again: "I think I told you before that Hooker is a complete convert. If I can convert Huxley I shall be content." (*Life*, vol. ii. p. 221.)

On all three, the effect of the book itself, with its detailed arguments and overwhelming array of evidence, was far greater than that of previous discussions. With one or two reservations as to the logical completeness of the theory, Huxley accepted it as a well-founded working hypothesis, calculated to explain problems otherwise inexplicable.

Two extracts from the chapter he contributed to the *Life of Darwin* show very clearly his attitude of mind when the *Origin of Species* was first published:—

EXTRACT from "The Reception of the 'Origin of Species'" in *Life and Letters of Charles Darwin*, vol. ii. pp. 187-90 and 195-97.

I think I must have read the *Vestiges* before I left England in 1846; but, if I did, the book made very little impression upon me, and I was not brought into serious contact with the "Species" question until after 1850. At that time, I had long done with the Pentateuchal cosmogony, which had been impressed upon my childish understanding as Divine truth, with all the authority of parents and instructors, and from which it had cost me many a struggle to get free. But my mind was unbiassed in respect of any doctrine which presented itself, if it professed to be based on purely philosophical and scientific reasoning. It seemed to me then (as it does now) that "creation," in the ordinary sense of the word, is perfectly conceivable. I find no difficulty in conceiving that, at some former period, this universe was not in existence; and that it made its appearance in six days (or instantaneously, if that is preferred), in consequence of the volition of some pre-existing Being. Then, as now, the so-called *a priori* arguments against Theism, and, given a Deity, against the possibility of creative acts, appeared to me to be devoid of reasonable foundation. I had not then, and I have not now, the smallest *a priori* objection to raise to the account of the creation of animals and plants given in *Paradise Lost*, in which Milton so vividly embodies the natural sense of Genesis. Far be it from me to say that it is untrue because it

is impossible. I confine myself to what must be regarded as a modest and reasonable request for some particle of evidence that the existing species of animals and plants did originate in that way, as a condition of my belief in a statement which appears to me to be highly improbable.

And, by way of being perfectly fair, I had exactly the same answer to give to the evolutionists of 1851-58. Within the ranks of the biologists, at that time, I met with nobody, except Dr. Grant of University College, who had a word to say for Evolution—and his advocacy was not calculated to advance the cause. Outside these ranks, the only person known to me whose knowledge and capacity compelled respect, and who was, at the same time, a thorough-going evolutionist, was Mr. Herbert Spencer, whose acquaintance I made, I think, in 1852, and then entered into the bonds of a friendship which, I am happy to think, has known no interruption. Many and prolonged were the battles we fought on this topic. But even my friend's rare dialectic skill and copiousness of apt illustration could not drive me from my agnostic position. I took my stand upon two grounds:—Firstly, that up to that time, the evidence in favour of transmutation was wholly insufficient; and secondly, that no suggestion respecting the causes of transmutation assumed, which had been made, was in any way adequate to explain the phenomena. Looking back at the state of knowledge at that time, I really do not see that any other conclusion was justifiable.

In those days I had never even heard of Treviranus' *Biologie*. However, I had studied Lamarck attentively, and I had read the *Vestiges* with due care; but neither of them afforded me any good ground for changing my negative and critical attitude. As for the *Vestiges*, I confess that the book simply irritated me by the prodigious ignorance and thoroughly unscientific habit of mind manifested by the writer. If it had any influence on me at all, it set me against Evolution; and the only review I ever have qualms of conscience about, on the ground of needless savagery, is one I wrote on the *Vestiges* while under that influence. . . .

But, by a curious irony of fate, the same influence which led me to put as little faith in modern speculations on this subject as in the venerable traditions recorded in the first two chapters of Genesis, was perhaps more potent than any other in keeping alive a sort of pious conviction that Evolution, after all, would turn out true. I have recently read afresh the first edition of

the *Principles of Geology*; and when I consider that this remarkable book had been nearly thirty years in everybody's hands, and that it brings home to any reader of ordinary intelligence a great principle and a great fact,—the principle that the past must be explained by the present, unless good cause be shown to the contrary; and the fact that so far as our knowledge of the past history of life on our globe goes, no such cause can be shown,—I cannot but believe that Lyell, for others, as for myself, was the chief agent in smoothing the road for Darwin. For consistent uniformitarianism postulates Evolution as much in the organic as in the inorganic world. The origin of a new species by other than ordinary agencies would be a vastly greater "catastrophe" than any of those which Lyell successfully eliminated from sober geological speculation.

Thus, looking back into the past, it seems to me that my own position of critical expectancy was just and reasonable, and must have been taken up, on the same grounds, by many other persons. If Agassiz told me that the forms of life which have successively tenanted the globe were the incarnations of successive thoughts of the Deity, and that He had wiped out one set of these embodiments by an appalling geological catastrophe as soon as His ideas took a more advanced shape, I found myself not only unable to admit the accuracy of the deductions from the facts of paleontology, upon which this astounding hypothesis was founded, but I had to confess my want of any means of testing the correctness of his explanation of them. And besides that, I could by no means see what the explanation explained. Neither did it help me to be told by an eminent anatomist that species had succeeded one another in time, in virtue of "a continuously operative creational law." That seemed to me to be no more than saying that species had succeeded one another in the form of a vote-catching resolution, with "law" to catch the man of science, and "creational" to draw the orthodox. So I took refuge in that "thätige Skepsis" which Goethe has so well defined; and, reversing the apostolic precept to be all things to all men, I usually defended the tenability of the received doctrines when I had to do with the transmutationist; and stood up for the possibility of transmutation among the orthodox—thereby, no doubt, increasing an already current, but quite undeserved, reputation for needless combativeness.

I remember, in the course of my first interview with Mr. Darwin, expressing my belief in the sharpness of the lines of demarcation between natural groups and in the absence of

transitional forms, with all the confidence of youth and imperfect knowledge. I was not aware, at that time, that he had then been many years brooding over the species-question; and the humorous smile which accompanied his gentle answer, that such was not altogether his view, long haunted and puzzled me. But it would seem that four or five years' hard work had enabled me to understand what it meant; for Lyell, writing to Sir Charles Bunbury (under date of April 30, 1856), says:—

“When Huxley, Hooker and Wollaston were at Darwin's last week, they (all four of them) ran a tilt against species—further, I believe, than they are prepared to go.”

I recollect nothing of this beyond the fact of meeting Mr. Wollaston; and except for Sir Charles's distinct assurance as to “all four,” I should have thought my *outré* was probably a counterblast to Wollaston's conservatism. With regard to Hooker, he was already, like Voltaire's Habbakuk, *capable de tout* in the way of advocating Evolution.

As I have already said, I imagine that most of those of my contemporaries who thought seriously about the matter, were very much in my own state of mind—inclined to say to both Mosaists and Evolutionists, “a plague on both your houses!” and disposed to turn aside from an interminable and apparently fruitless discussion, to labour in the fertile fields of ascertainable fact. And I may therefore suppose that the publication of the Darwin and Wallace paper in 1858, and still more that of the “Origin” in 1859, had the effect upon them of the flash of light which, to a man who has lost himself on a dark night, suddenly reveals a road which, whether it takes him straight home or not, certainly goes his way. That which we were looking for, and could not find, was a hypothesis respecting the origin of known organic forms which assumed the operation of no causes but such as could be proved to be actually at work. We wanted, not to pin our faith to that or any other speculation, but to get hold of clear and definite conceptions which could be brought face to face with facts and have their validity tested. The “Origin” provided us with the working hypothesis we sought. Moreover, it did the immense service of freeing us for ever from the dilemma—Refuse to accept the creation hypothesis, and what have you to propose that can be accepted by any cautious reasoner? In 1857 I had no answer ready, and I do not think that anyone else had. A year later we reproached ourselves with dulness for being perplexed with such an inquiry. My reflection, when I first made myself master of

the central idea of the "Origin" was, "How extremely stupid not to have thought of that!" I suppose that Columbus' companions said much the same when he made the egg stand on end. The facts of variability, of the struggle for existence, of adaptation to conditions, were notorious enough; but none of us had suspected that the road to the heart of the species problem lay through them, until Darwin and Wallace dispelled the darkness, and the beacon-fire of the "Origin" guided the benighted.

Whether the particular shape which the doctrine of Evolution, as applied to the organic world, took in Darwin's hands, would prove to be final or not, was to me a matter of indifference. In my earliest criticisms of the "Origin" I ventured to point out that its logical foundation was insecure so long as experiments in selective breeding had not produced varieties which were more or less infertile; and that insecurity remains up to the present time. But, with any and every critical doubt which my sceptical ingenuity could suggest, the Darwinian hypothesis remained incomparably more probable than the creation hypothesis. And if we had none of us been able to discern the paramount significance of some of the most patent and notorious of natural facts, until they were, so to speak, thrust under our noses, what force remained in the dilemma—creation or nothing? It was obvious that hereafter the probability would be immensely greater, that the links of natural causation were hidden from our purblind eyes, than that natural causation should be incompetent to produce all the phenomena of nature. The only rational course for those who had no other object than the attainment of truth was to accept "Darwinism" as a working hypothesis and see what could be made of it. Either it would prove its capacity to elucidate the facts of organic life, or it would break down under the strain. This was surely the dictate of common sense, and, for once, common sense carried the day.

Even before the "Origin" actually came out, Huxley had begun to act as what Darwin afterwards called his "general agent." He began to prepare the way for the acceptance of the theory of evolution by discussing, for instance, one of the most obvious difficulties, namely, How is it that if evolution is ever progressive, progress is not universal? It was a point with respect to which Darwin himself wrote soon after the publication of the "Origin":—"Judging

from letters . . . and from remarks, the most serious omission in my book was not explaining how it is, as I believe, that all forms do not necessarily advance, how there can now be *simple* organisms existing." (May 22, 1860.)

Huxley's idea, then, was to call attention to the persistence of many types without appreciable progression during geological time; to show that this fact was not explicable on any other hypothesis than that put forward by Darwin; and by paleontological arguments, to pave the way for consideration of the imperfection of the geological record.

Such were the lines on which he delivered his Friday evening lecture on "Persistent Types" at the Royal Institution on June 3, 1859.

However, the chief part which he took at this time in extending the doctrines of evolution was in applying them to his own subjects, Development and Vertebrate Anatomy, and more particularly to the question of the origin of mankind.

Of all the burning questions connected with the Origin of Species, this was the most heated—the most surrounded by prejudice and passion. To touch it was to court attack; to be exposed to endless scorn, ridicule, misrepresentation, abuse—almost to social ostracism. But the facts were there; the structural likenesses between the apes and man had already been shown; and as Huxley warned Darwin, "I will stop at no point so long as clear reasoning will carry me further."

Now two years before the "Origin" appeared, the denial of these facts by a leading anatomist led Huxley, as was his wont, to re-investigate the question for himself and satisfy himself one way or the other. He found that the previous investigators were not mistaken. Without going out of his way to refute the mis-statement as publicly as it was made, he simply embodied his results in his regular teaching. But the opportunity came unsought. Fortified by his own researches, he openly challenged these assertions when repeated at the Oxford meeting of the British Association in 1860, and promised to make good his challenge in the proper place.



We also find him combating some of the difficulties in the way of accepting the theory laid before him by Sir Charles Lyell. The veteran geologist had been Darwin's confidant from almost the beginning of his speculations; he had really paved the way for the evolutionary doctrine by his own proof of geological uniformity, but he shrank from accepting it, for its inevitable extension to the descent of man was repugnant to his feelings. Nevertheless, he would not allow sentiment to stand in the way of truth, and after the publication of the "Origin" it could be said of him—

Lyell, up to that time a pillar of the anti-transmutationists (who regarded him, ever after, as Pallas Athene may have looked at Dian, after the Endymion affair), declared himself a Darwinian, though not without putting in a serious *caveat*. Nevertheless, he was a tower of strength, and his courageous stand for truth as against consistency did him infinite honour.—(T. H. H. in *Life of Darwin*, vol ii. p. 231.)

#### TO SIR CHARLES LYELL

June 25, 1859.

MY DEAR SIR CHARLES—I have endeavoured to meet your objections in the enclosed.—Ever yours, very truly,

T. H. H.

The fixity and definite limitation of species, genera, and larger groups appear to me to be perfectly consistent with the theory of transmutation. In other words, I think *transmutation* may take place without transition.

Suppose that external conditions acting on species A give rise to a new species, B; the difference between the two species is a certain definable amount which may be called A-B. Now I know of no evidence to show that the interval between the two species must *necessarily* be bridged over by a series of forms, each of which shall occupy, as it occurs, a fraction of the distance between A and B. On the contrary, in the history of the Ancon sheep, and of the six-fingered Maltese family, given by Réaumur, it appears that the new form appeared at once in full perfection.

I may illustrate what I mean by a chemical example. In an organic compound, having a precise and definite composition, you may effect all sorts of transmutations by substituting an

atom of one element for an atom of another element. You may in this way produce a vast series of modifications—but each modification is definite in its composition, and there are no transitional or intermediate steps between one definite compound and another. I have a sort of notion that similar laws of definite combination rule over the modifications of organic bodies, and that in passing from species to species “*Natura fecit saltum.*”

All my studies lead me to believe more and more in the absence of any real transitions between natural groups, great and small—but with what we know of the physiology of conditions [?] this opinion seems to me to be quite consistent with transmutation.

When I say that no evidence, or hardly any, would justify one in believing in the view of a new species of Elephant, *e.g.* out of the earth, I mean that such an occurrence would be so diametrically contrary to all experience, so opposed to those beliefs which are the most constantly verified by experience, that one would be justified in believing either that one's senses were deluded, or that one had not really got to the bottom of the phenomenon. Of course, if one could vary the conditions, if one could take a little silex, and by a little *hocus-pocus* à la crosse, galvanise a baby out of it as often as one pleased, all the philosopher could do would be to hold up his hands and cry, “*God is great.*” But short of evidence of this kind, I don't mean to believe anything of the kind.

How much evidence would you require to believe that there was a time when stones fell upwards, or granite made itself by a spontaneous rearrangement of the elementary particles of clay and sand? And yet the difficulties in the way of these beliefs are as nothing compared to those which you would have to overcome in believing that complex organic beings made themselves (for that is what creation comes to in scientific language) out of inorganic matter.

I know it will be said that even on the transmutation theory, the first organic being must have made itself. But there is as much difference between supposing the passage of inorganic matter into an *amoeba*, *e.g.*, and into an *Elephant*, as there is between supposing that Portland stone might have built itself up into St. Paul's, and believing that the Giant's Causeway may have come about by natural causes.

True, one must believe in a beginning somewhere, but science consists in not believing the having reached that beginning before one is forced to do so.

It is wholly impossible to prove that any phenomenon whatsoever is not produced by the interposition of some unknown cause. But philosophy has prospered exactly as it has disregarded such possibilities, and has endeavoured to resolve every event by ordinary reasoning.

I do not exactly see the force of your argument that we are bound to find fossil forms intermediate between men and monkeys in the Rocks. Crocodiles are the highest reptiles as men are the highest mammals, but we find nothing intermediate between *crocodilia* and *lacertilia* in the whole range of the Mesozoic rocks. How do we know that Man is not a persistent type? And as for implements, at this day, and as, I suppose, for the last two or three thousand years at least, the savages of Australia have made their weapons of nothing but bone and wood. Why should *Homo Eocenus* or *Ooliticus*, the fellows who waddied the *Amphitherium* and speared the *Phascolotherium* as the Australian niggers treat their congeners, have been more advanced?

I by no means suppose that the transmutation hypothesis is proven or anything like it. But I view it as a powerful instrument of research. Follow it out, and it will lead us somewhere; while the other notion is like all the modifications of "final causation," a barren virgin.

And I would very strongly urge upon you that it is the logical development of Uniformitarianism, and that its adoption would harmonise the spirit of Paleontology with that of Physical Geology.

## CHAPTER XIV

1859-60

THE "Origin" appeared in November. As soon as he had read it, Huxley wrote the following letter to Darwin (already published in *Life of Darwin*, vol. ii. p. 231):—

JERMYN STREET, W., *November 23, 1859.*

MY DEAR DARWIN—I finished your book yesterday, a lucky examination having furnished me with a few hours of continuous leisure.

Since I read Von Bär's essays, nine years ago, no work on Natural History Science I have met with has made so great an impression upon me, and I do most heartily thank you for the great store of new views you have given me. Nothing, I think, can be better than the tone of the book; it impresses those who know about the subject. As for your doctrine, I am prepared to go to the stake, if requisite, in support of Chapter IX\* and most parts of Chapters X, XI, XII, and Chapter XIII contains much that is most admirable, but on one or two points I enter a *caveat* until I can see further into all sides of the question.

As to the first four chapters,† I agree thoroughly and fully with all the principles laid down in them. I think you have demonstrated a true cause for the production of species, and have thrown the *onus probandi*, that species did not arise in the way you suppose, on your adversaries.

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\* Chapter IX, The Imperfection of the Geological Record; X, The Geological Succession of Organic Beings; XI–XII, Geographical Distribution; XIII, Classification, Morphology, Embryology, and Rudimentary Organs.

† Chapter I, Variation under Domestication; II, Variation under Nature; III, The Struggle for Existence; IV, Operation of Natural Selection; V, Laws of Variation.

But I feel that I have not yet by any means fully realised the bearings of those most remarkable and original Chapters—III, IV, and V, and I will write no more about them just now.

The only objections that have occurred to me are—1st, That you have loaded yourself with an unnecessary difficulty in adopting *Natura non facit saltum* so unreservedly; and 2nd, It is not clear to me why, if continual physical conditions are of so little moment as you suppose, variation should occur at all.

However, I must read the book two or three times more before I presume to begin picking holes.

I trust you will not allow yourself to be in any way disgusted or annoyed by the considerable abuse and misrepresentation which, unless I greatly mistake, is in store for you. Depend upon it, you have earned the lasting gratitude of all thoughtful men. And as to the curs which will bark and yelp, you must recollect that some of your friends, at any rate, are endowed with an amount of combativeness which (though you have often and justly rebuked it) may stand you in good stead.

I am sharpening up my claws and beak in readiness.

Looking back over my letter, it really expresses so feebly all I think about you and your noble book, that I am half-ashamed of it; but you will understand that, like the parrot in the story, "I think the more."—Ever yours faithfully,

T. H. HUXLEY.

A month later, fortune put into his hands the opportunity of striking a vigorous and telling blow for the newly-published book. Never was windfall more eagerly accepted. A short account of this lucky chance was written by him for the *Darwin Life* (vol. i. p. 255).

The "Origin" was sent to Mr. Lucas, one of the staff of the *Times* writers at that day, in what was I suppose the ordinary course of business. Mr. Lucas, though an excellent journalist, and at a later period, editor of *Once a Week*, was as innocent of any knowledge of science as a babe, and bewailed himself to an acquaintance on having to deal with such a book. Whereupon, he was recommended to ask me to get him out of his difficulty, and he applied to me accordingly, explaining, however, that it would be necessary for him formally to adopt anything I might be disposed to write, by prefacing it with two or three paragraphs of his own.

I was too anxious to seize upon the opportunity thus offered

of giving the book a fair chance with the multitudinous readers of the *Times*, to make any difficulty about conditions; and being then very full of the subject, I wrote the article faster, I think, than I ever wrote anything in my life, and sent it to Mr. Lucas, who duly prefixed his opening sentences.

When the article appeared, there was much speculation as to its authorship. The secret leaked out in time, as all secrets will, but not by my aid; and then I used to derive a good deal of innocent amusement from the vehement assertions of some of my more acute friends, that they knew it was mine from the first paragraph!

As the *Times* some years since, referred to my connection with the review, I suppose there will be no breach of confidence in the publication of this little history, if you think it worth the space it will occupy.

The article appeared on December 26. Only Hooker was admitted into the secret. In an undated note Huxley writes to him:—

I have written the other review you wot of, and have handed it over to my friend to deal as he likes with it. . . . Darwin will laugh over a letter that I sent him this morning with a vignette of the Jermyn Street "pet" ready to fight his battle, and the "judicious Hooker" holding the bottle.

And on December 31 he writes again:—

JERMYN STREET, *December 31, 1859.*

MY DEAR HOOKER—I have not the least objection to my share in the *Times* article being known, only I should not like to have anything stated on my authority. The fact is, that the first quarter of the first column (down to "what is a species," etc.) is not mine, but belongs to the man who is the official reviewer for the *Times* (my "Temporal" godfather I might call him).

The rest is in my *ipsissima verba*, and I only wonder that it turns out as well as it does—for I wrote it faster than ever I wrote anything in my life. The last column nearly as fast as my wife could read the sheets. But I was thoroughly in the humour and full of the subject. Of course as a scientific review the thing is worth nothing, but I earnestly hope it may have made some of the educated mob, who derive their ideas from the *Times*, reflect. And whatever they do, they *shall* respect Darwin.

Pray give my kindest regards and best wishes for the New

Year to Mrs. Hooker, and tell her that if she, of her own natural sagacity and knowledge of the naughtiness of my heart, affirms that I wrote the article, I shall not contradict her—but that for reasons of state—I must not be supposed to say anything. I am pretty certain the Saturday article was not written by Owen. On internal grounds, because no word in it exceeds an inch in length; on external, from what Cook said to me. The article is weak enough and one-sided enough, but looking at the various forces in action, I think Cook has fully redeemed his promise to me.

I went down to Sir P. Egerton on Tuesday—was ill when I started, got worse and had to come back on Thursday. I am all adrift now, but I couldn't stand being in the house any longer. I wish I had been born an *an-hepatous fetus*.

All sorts of good wishes to you, and may you and I and Tyndalides, and one or two more bricks, be in as good fighting order in 1861 as in 1860.—Ever yours,  
T. H. HUXLEY.

Speaking of this period and the half-dozen preceding years, in his 1894 preface to *Man's Place in Nature* he says:—

Among the many problems which came under my consideration, the position of the human species in zoological classification was one of the most serious. Indeed, at that time it was a burning question in the sense that those who touched it were almost certain to burn their fingers severely. It was not so very long since my kind friend, Sir William Lawrence, one of the ablest men whom I have known, had been well-nigh ostracised for his book *On Man*, which now might be read in a Sunday school without surprising anybody; it was only a few years since the electors to the chair of Natural History in a famous northern university had refused to invite a very distinguished man to occupy it because he advocated the doctrine of the diversity of species of mankind, or what was called "polygeny." Even among those who considered man from the point of view, not of vulgar prejudice, but of science, opinions lay poles asunder. Linnæus had taken one view, Cuvier another; and among my senior contemporaries, men like Lyell, regarded by many as revolutionaries of the deepest dye, were strongly opposed to anything which tended to break down the barrier between man and the rest of the animal world.

My own mind was by no means definitely made up about this

matter when, in the year 1857, a paper was read before the Linnæan Society "On the Characters, Principles of Division and Primary Groups of the Class Mammalia," in which certain anatomical features of the brain were said to be "peculiar to the genus 'Homo,'" and were made the chief ground for separating that genus from all other mammals and placing him in a division, "Archencephala," apart from, and superior to, all the rest. As these statements did not agree with the opinions I had formed, I set to work to reinvestigate the subject; and soon satisfied myself that the structures in question were not peculiar to Man, but were shared by him with all the higher and many of the lower apes. I embarked in no public discussion of these matters, but my attention being thus drawn to them, I studied the whole question of the structural relations of Man to the next lower existing forms, with much care. And, of course, I embodied my conclusions in my teaching.

Matters were at this point when the *Origin of Species* appeared. The weighty sentence, "Light will be thrown on the origin of man and his history" (1st edition, p. 488), was not only in full harmony with the conclusions at which I had arrived respecting the structural relations of apes and men, but was strongly supported by them. And inasmuch as Development and Vertebrate Anatomy were not among Mr. Darwin's many specialities, it appeared to me that I should not be intruding on the ground he had made his own, if I discussed this part of the general question. In fact, I thought that I might probably serve the cause of Evolution by doing so.

Some experience of popular lecturing had convinced me that the necessity of making things clear to uninstructed people was one of the very best means of clearing up the obscure corners in one's own mind. So, in 1860, I took the Relation of Man to the Lower Animals for the subject of the six lectures to working men which it was my duty to deliver. It was also in 1860 that this topic was discussed before a jury of experts at the meeting of the British Association at Oxford, and from that time a sort of running fight on the same subject was carried on, until it culminated at the Cambridge Meeting of the Association in 1862, by my friend Sir W. Flower's public demonstration of the existence in the apes of those cerebral characters which had been said to be peculiar to man.

The famous Oxford Meeting of 1860 was of no small importance in Huxley's career. It was not merely that he



helped to save a great cause from being stifled under misrepresentation and ridicule—that he helped to extort for it a fair hearing; it was now that he first made himself known in popular estimation as a dangerous adversary in debate—a personal force in the world of science which could not be neglected. From this moment he entered the front fighting line in the most exposed quarter of the field.

Most unluckily, no contemporary account of his own exists of the encounter. Indeed, the same cause which prevented his writing home the story of the day's work nearly led to his absence from the scene. It was known that Bishop Wilberforce, whose first class in mathematics gave him, in popular estimation, a right to treat on scientific matters, intended to "smash Darwin"; and Huxley, expecting that the promised debate would be merely an appeal to prejudice in a mixed audience, before which the scientific arguments of the Bishop's opponents would be at the utmost disadvantage, intended to leave Oxford that very morning and join his wife at Hardwicke, near Reading, where she was staying with her sister. But in a letter, quoted below, he tells how, on the Friday afternoon, he chanced to meet Robert Chambers, the reputed author of the *Vestiges of Creation*, who begged him "not to desert them." Accordingly he postponed his departure; but seeing his wife next morning, had no occasion to write a letter.

Several accounts of the scene are already in existence: one in the *Life of Darwin* (vol. ii. p. 320), another in the *1892 Life*, p. 236 sq.; a third that of *Lyell* (vol. ii. p. 335), the slight differences between them representing the difference between individual recollections of eye-witnesses. In addition to these I have been fortunate enough to secure further reminiscences from several other eye-witnesses.

Two papers in Section D, of no great importance in themselves, became historical as affording the opponents of Darwin their opportunity of making an attack upon his theory which should tell with the public. The first was on Thursday, June 28. Dr. Daubeny of Oxford made a communication to the Section, "On the final causes of the sexuality of plants, with particular reference to Mr. Darwin's

work on the *Origin of Species*." \* Huxley was called upon to speak by the President, but tried to avoid a discussion, on the ground "that a general audience, in which sentiment would unduly interfere with intellect, was not the public before which such a discussion should be carried on."

This consideration, however, did not stop the discussion; it was continued by Owen. He said he "wished to approach the subject in the spirit of the philosopher," and declared his "conviction that there were facts by which the public could come to some conclusion with regard to the probabilities of the truth of Mr. Darwin's theory." As one of these facts, he stated that the brain of the gorilla "presented more differences, as compared with the brain of man, than it did when compared with the brains of the very lowest and most problematical of the *Quadrumana*."

Now this was the very point, as said above, upon which Huxley had made special investigations during the last two years, with precisely opposite results, such as, indeed, had been arrived at by previous investigators. Hereupon he replied, giving these assertions a "direct and unqualified contradiction," and pledging himself to "justify that unusual procedure elsewhere,"—a pledge which was amply fulfilled in the pages of the *Natural History Review* for 1861.

Accordingly it was to him, thus marked out as the champion of the most debatable thesis of evolution, that, two days later, the Bishop addressed his sarcasms, only to meet with a withering retort. For on the Friday there was peace; but on the Saturday came a yet fiercer battle over the "Origin," which loomed all the larger in the public eye, because it was not merely the contradiction of one anatomist by another, but the open clash between Science and the Church. It was, moreover, not a contest of bare fact or abstract assertion, but a combat of wit between two individuals, spiced with the personal element which appeals to one of the strongest instincts of every large audience.

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\* My best thanks are due to Mr. F. Darwin for permission to quote his accounts of the meeting; other citations are from the *Athenæum* reports of July 14, 1860.

It was the merest chance, as I have already said, that Huxley attended the meeting of the section that morning. Dr. Draper of New York was to read a paper on the "Intellectual Development of Europe considered with reference to the views of Mr. Darwin." "I can still hear," writes one who was present, "the American accents of Dr. Draper's opening address when he asked 'Air we a fortuitous course of atoms?'" However, it was not to hear him, but the eloquence of the Bishop, that the members of the Association crowded in such numbers into the Lecture Room of the Museum, that this, the appointed meeting-place of the section, had to be abandoned for the long west room, since cut in two by a partition for the purposes of the library. It was not term time, nor were the general public admitted; nevertheless the room was crowded to suffocation long before the protagonists appeared on the scene, 700 persons or more managing to find places. The very windows by which the room was lighted down the length of its west side were packed with ladies, whose white handkerchiefs, waving and fluttering in the air at the end of the Bishop's speech, were an unforgettable factor in the acclamation of the crowd.

On the east side between the two doors was the platform. Professor Henslow, the President of the section, took his seat in the centre; upon his right was the Bishop, and beyond him again Dr. Draper; on his extreme left was Mr. Dingle, a clergyman from Lanchester, near Durham, with Sir J. Hooker and Sir J. Lubbock in front of him, and nearer the centre, Professor Beale of King's College, London, and Huxley.

The clergy, who shouted lustily for the Bishop, were massed in the middle of the room; behind them in the north-west corner a knot of undergraduates (one of these was T. H. Green, who listened but took no part in the cheering) had gathered together beside Professor Brodie, ready to lift their voices, poor minority though they were, for the opposite party. Close to them stood one of the few men among the audience already in Holy orders, who joined in—and indeed led—the cheers for the Darwinians.

So "Dr. Draper droned out his paper, turning first to the right hand and then to the left, of course bringing in a reference to the Origin of Species which set the ball rolling."

An hour or more that paper lasted, and then discussion began. The President "wisely announced *in limine* that none who had not valid arguments to bring forward on one side or the other would be allowed to address the meeting; a caution that proved necessary, for no fewer than four combatants had their utterances burked by him, because of their indulgence in vague declamation."\*

First spoke (writes Professor Farrar †) a layman from Brompton, who gave his name as being one of the Committee of the (newly formed) Economic section of the Association. He, in a stentorian voice, let off his theological venom. Then jumped up Richard Greswell ‡ with a thin voice, saying much the same, but speaking as a scholar; but we did not merely want any theological discussion, so we shouted them down. Then a Mr. Dingle got up and tried to show that Darwin would have done much better if he had taken him into consultation. He used the blackboard and began a mathematical demonstration on the question—"Let this point A be man, and let that point B be the mawnkey." He got no further; he was shouted down with cries of "mawnkey." None of these had spoken more than three minutes. It was when these were shouted down that Henslow said he must demand that the discussion should rest on *scientific* grounds only.

Then there were calls for the Bishop, but he rose and said he understood his friend Professor Beale had something to say first. Beale, who was an excellent histologist, spoke to the effect that the new theory ought to meet with fair discussion, but added, with great modesty, that he himself had not sufficient knowledge to discuss the subject adequately. Then the Bishop spoke the speech that you know, and the question about his mother being an ape, or his grandmother.

From the scientific point of view, the speech was of small value. It was evident from his mode of handling the subject that he had been "crammed up to the throat," and

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\* *Life of Darwin, l.c.*

† Canon of Durham.

‡ Rev. Richard Greswell, B.D., Tutor of Worcester College.

knew nothing at first hand; he used no argument beyond those to be found in his *Quarterly* article, which appeared a few days later, and is now admitted to have been inspired by Owen. "He ridiculed Darwin badly and Huxley savagely; but," confesses one of his strongest opponents, "all in such dulcet tones, so persuasive a manner, and in such well turned periods, that I who had been inclined to blame the President for allowing a discussion that could serve no scientific purpose, now forgave him from the bottom of my heart." \*

The Bishop spoke thus "for full half an hour with inimitable spirit, emptiness and unfairness." "In a light, scoffing tone, florid and fluent, he assured us there was nothing in the idea of evolution; rock-pigeons were what rock-pigeons had always been. Then, turning to his antagonist with a smiling insolence, he begged to know, was it through his grandfather or his grandmother that he claimed his descent from a monkey?" †

This was the fatal mistake of his speech. Huxley instantly grasped the tactical advantage which the descent to personalities gave him. He turned to Sir Benjamin Brodie, who was sitting beside him, and emphatically striking his hand upon his knee, exclaimed, "The Lord hath delivered him into mine hands." The bearing of the exclamation

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\* *Life of Darwin, l.c.*

† "Reminiscences of a Grandmother," *Macmillan's Magazine*, October 1898. Professor Farrar thinks this version of what the Bishop said is slightly inaccurate. His impression is that the words actually used seemed at the moment flippant and unscientific rather than insolent, vulgar, or personal. The Bishop, he writes, "had been talking of the perpetuity of species of Birds; and then, denying *a fortiori* the derivation of the species Man from Ape, he rhetorically invoked the aid of *feeling*, and said, 'If any one were to be willing to trace his descent through an ape as his *grandfather*, would he be willing to trace his descent similarly on the side of his *grandmother*?' His false humour was an attempt to arouse the antipathy about degrading *woman* to the *quadrumana*. Your father's reply showed there was vulgarity as well as folly in the Bishop's words; and the impression distinctly was, that the Bishop's party, as they left the room, felt abashed, and recognised that the Bishop had forgotten to behave like a perfect gentleman."

did not dawn upon Sir Benjamin until after Huxley had completed his "forcible and eloquent" answer to the scientific part of the Bishop's argument, and proceeded to make his famous retort.\*

On this (continues the writer in *Macmillan's Magazine*) Mr. Huxley slowly and deliberately arose. A slight tall figure, stern and pale, very quiet and very grave,† he stood before us and spoke those tremendous words—words which no one seems sure of now, nor, I think, could remember just after they were spoken, for their meaning took away our breath, though it left us in no doubt as to what it was. He was not ashamed to have a monkey for his ancestor; but he would be ashamed to be connected with a man who used great gifts to obscure the truth. No one doubted his meaning, and the effect was tremendous. One lady fainted and had to be carried out; I, for one, jumped out of my seat.

The fullest and probably most accurate account of these concluding words is the following, from a letter of the late

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\* The *Athenæum* reports him as saying that Darwin's theory was an explanation of phenomena in Natural History, as the undulatory theory was of the phenomena of light. No one objected to that theory because an undulation of light had never been arrested and measured. Darwin's theory was an explanation of facts, and his book was full of new facts, all bearing on his theory. Without asserting that every part of that theory had been confirmed, he maintained that it was the best explanation of the origin of species which had yet been offered. With regard to the psychological distinction between men and animals, man himself was once a monad—a mere atom, and nobody could say at what moment in the history of his development he became consciously intelligent. The question was not so much one of a transmutation or transition of species, as of the production of forms which became permanent.

Thus the short-legged sheep of America was not produced gradually, but originated in the birth of an original parent of the whole stock, which had been kept up by a rigid system of artificial selection.

† "Young, cool, quiet, scientific—scientific in fact and in treatment."—J. R. Green. A certain piquancy must have been added to the situation by the superficial resemblance in feature between the two men, so different in temperament and expression. Indeed next day at Hardwicke, a friend came up to Mr. Fanning and asked who his guest was, saying, "Surely it is the son of the Bishop of Oxford."

John Richard Green, then an undergraduate, to his friend, afterwards Professor Boyd Dawkins\* :—

I asserted—and I repeat—that a man has no reason to be ashamed of having an ape for his grandfather. If there were an ancestor whom I should feel shame in recalling it would rather be a man—a man of restless and versatile intellect—who, not content with an equivocal † success in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance, only to obscure them by an aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digressions and skilled appeals to religious prejudice. ‡

Further, Mr. A. G. Vernon-Harcourt, F.R.S., Reader in Chemistry at the University of Oxford, writes to me :—

The Bishop had rallied your father as to the descent from a monkey, asking as a sort of joke how recent this had been, whether it was his grandfather or further back. Your father, in replying on this point, first explained that the suggestion was of descent through thousands of generations from a common ancestor, and then went on to this effect—“ But if this question is treated, not as a matter for the calm investigation of science, but as a matter of sentiment, and if I am asked whether I would choose to be descended from the poor animal of low intelligence and stooping gait, who grins and chatters as we pass, or from a man, endowed with great ability and a splendid position, who should use these gifts ” [here, as the point became clear, there was a great outburst of applause, which mostly drowned the end of the sentence] “ to discredit and crush humble seekers after truth, I hesitate what answer to make.”

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\* The writer in *Macmillan's* tells me : “ I cannot quite accept Mr. J. R. Green's sentences as your father's, though I didn't doubt that they convey the sense ; but then I think that only a shorthand writer could reproduce Mr. Huxley's singularly beautiful style—so simple and so incisive. The sentence given is much too ‘ Green.’ ”

† My father once told me that he did not remember using the word “equivocal” in this speech. (See his letter below.) The late Professor Victor Carus had the same impression, which is corroborated by Professor Farrar.

‡ As the late Henry Fawcett wrote in *Macmillan's Magazine*, 1860 :— “ The retort was so justly deserved, and so inimitable in its manner, that no one who was present can ever forget the impression that it made.”

No doubt your father's words were better than these, and they gained effect from his clear, deliberate utterance, but in outline and in *scale* this represents truly what was said.

After the commotion was over, "some voices called for Hooker, and his name having been handed up, the President invited him to give his view of the theory from the Botanical side. This he did, demonstrating that the Bishop, by his own showing, had never grasped the principles of the 'Origin,' and that he was absolutely ignorant of the elements of botanical science. The Bishop made no reply, and the meeting broke up." \*

ACCOUNT OF THE OXFORD MEETING by the REV. W. H. FREEMANTLE (in *Charles Darwin, his Life Told, &c.*, 1892, p. 238).

The Bishop of Oxford attacked Darwin, at first playfully, but at last in grim earnest. It was known that the Bishop had written an article against Darwin in the last *Quarterly Review*; † it was also rumoured that Professor Owen had been staying at Cuddesdon and had primed the Bishop, who was to act as mouthpiece to the great Palæontologist, who did not himself dare to enter the lists. The Bishop, however, did not show himself master of the facts, and made one serious blunder. A fact which had been much dwelt on as confirmatory of Darwin's idea of variation, was that a sheep had been born shortly before in a flock in the North of England, having an addition of one to the vertebræ of the spine. The Bishop was declaring with rhetorical exaggeration that there was hardly any evidence on Darwin's side. "What have they to bring forward?" he exclaimed. "Some rumoured statement about a long-legged sheep." But he passed on to banter: "I should like to ask Professor Huxley, who is sitting by me, and is about to tear me to pieces when I have sat down, as to his belief in being descended from an ape. Is it on his grandfather's or his grandmother's side that the ape ancestry comes in?" And then taking a graver tone, he asserted, in a solemn peroration, that Darwin's views were contrary to the revelation of God in the Scriptures. Professor Huxley was unwilling to respond: but

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\* *Life of Darwin, l.c.*

† It appeared in the ensuing number for July.



he was called for, and spoke with his usual incisiveness and with some scorn: "I am here only in the interests of science," he said, "and I have not heard anything which can prejudice the case of my august client." Then after showing how little competent the Bishop was to enter upon the discussion, he touched on the question of Creation. "You say that development drives out the Creator; but you assert that God made you: and yet you know that you yourself were originally a little piece of matter, no bigger than the end of this gold pencil-case." Lastly as to the descent from a monkey, he said: "I should feel it no shame to have risen from such an origin; but I should feel it a shame to have sprung from one who prostituted the gifts of culture and eloquence to the service of prejudice and of falsehood."

Many others spoke. Mr. Gresley, an old Oxford don, pointed out that in human nature at least orderly development was not the necessary rule: Homer was the greatest of poets, but he lived 3000 years ago, and has not produced his like.

Admiral FitzRoy was present, and said he had often expostulated with his old comrade of the *Beagle* for entertaining views which were contradictory to the First Chapter of Genesis.

Sir John Lubbock declared that many of the arguments by which the permanence of species was supported came to nothing, and instanced some wheat which was said to have come off an Egyptian mummy, and was sent to him to prove that wheat had not changed since the time of the Pharaohs; but which proved to be made of French chocolate. Sir Joseph (then Dr.) Hooker spoke shortly, saying that he had found the hypothesis of Natural Selection so helpful in explaining the phenomena of his own subject of Botany, that he had been constrained to accept it. After a few words from Darwin's old friend, Professor Henslow, who occupied the chair, the meeting broke up, leaving the impression that those most capable of estimating the arguments of Darwin in detail saw their way to accept his conclusions.

*Note.*—Sir John Lubbock also insisted on the embryological evidence for evolution. F. D.

#### T. H. HUXLEY TO FRANCIS DARWIN (*ibid.*)

June 27, 1891.

I should say that Freemantle's account is substantially correct, but that Green has the substance of my speech more accurately. However, I am certain I did not use the word, "equivocal."

The odd part of the business is, that I should not have been present except for Robert Chambers. I had heard of the Bishop's intention to utilise the occasion. I knew he had the reputation of being a first-class controversialist, and I was quite aware that if he played his cards properly, we should have little chance, with such an audience, of making an efficient defence. Moreover, I was very tired, and wanted to join my wife at her brother-in-law's country house near Reading, on the Saturday. On the Friday I met Chambers in the street, and in reply to some remark of his, about his going to the meeting, I said that I did not mean to attend it—did not see the good of giving up peace and quietness to be episcopally pounded. Chambers broke out into vehement remonstrances, and talked about my deserting them. So I said, "Oh! if you are going to take it that way, I'll come and have my share of what is going on."

So I came, and chanced to sit near old Sir Benjamin Brodie. The Bishop began his speech, and to my astonishment very soon showed that he was so ignorant that he did not know how to manage his own case. My spirits rose proportionately, and when he turned to me with his insolent question, I said to Sir Benjamin, in an undertone, "The Lord hath delivered him into mine hands."

That sagacious old gentleman stared at me as if I had lost my senses. But, in fact, the Bishop had justified the severest retort I could devise, and I made up my mind to let him have it. I was careful, however, not to rise to reply, until the meeting called for me—then I let myself go.

In justice to the Bishop, I am bound to say he bore no malice, but was always courtesy itself when we occasionally met in after years. Hooker and I walked away from the meeting together, and I remember saying to him that this experience had changed my opinion as to the practical value of the art of public speaking, and that from that time forth I should carefully cultivate it, and try to leave off hating it. I did the former, but never quite succeeded in the latter effort.

I did not mean to trouble you with such a long scrawl when I began about this piece of ancient history.—Ever yours very faithfully,  
T. H. HUXLEY.

In the evening there was a crowded *conversazione* in Dr. Daubeny's rooms, and here, continues the writer in *Macmillan's*, "everyone was eager to congratulate the hero of the day. I remember that some naive person wished 'it

could come over again'; Mr. Huxley, with the look on his face of the victor who feels the cost of victory, put us aside saying, 'Once in a lifetime is enough, if not too much.'

In a letter to me the same writer remarks—

I gathered from Mr. Huxley's look when I spoke to him at Dr. Daubeny's that he was not quite satisfied to have been forced to take so personal a tone—it a little jarred upon his fine taste. But it was the Bishop who first struck the insolent note of personal attack.

Again, with reference to the state of feeling at the meeting:—

I never saw such a display of fierce party spirit, the looks of bitter hatred which the audience bestowed—(I mean the majority) on us who were on your father's side—as we passed through the crowd we felt that we were expected to say “how abominably the Bishop was treated”—or to be considered outcasts and detestable.

It was very different, however, at Dr. Daubeny's, “where,” says the writer of the account in *Darwin's Life*, “the almost sole topic was the battle of the ‘Origin,’ and I was much struck with the fair and unprejudiced way in which the black coats and white cravats of Oxford discussed the question, and the frankness with which they offered their congratulations to the winners in the combat.”

The result of this encounter, though a check to the other side, cannot, of course, be represented as an immediate and complete triumph for evolutionary doctrine. This was precluded by the character and temper of the audience, most of whom were less capable of being convinced by the arguments than shocked by the boldness of the retort, although, being gentlefolk, as Professor Farrar remarks, they were disposed to admit on reflection that the Bishop had erred on the score of taste and good manners. Nevertheless, it was a noticeable feature of the occasion, Sir M. Foster tells me, that when Huxley rose he was received coldly, just a cheer of encouragement from his friends, the audience as a whole not joining in it. But as he made his points

the applause grew and widened, until, when he sat down, the cheering was not very much less than that given to the Bishop. To that extent he carried an unwilling audience with him by the force of his speech. The debate on the ape question, however, was continued elsewhere during the next two years, and the evidence was completed by the unanswerable demonstrations of Sir W. H. Flower at the Cambridge meeting of the Association in 1862.

The importance of the Oxford meeting lay in the open resistance that was made to authority, at a moment when even a drawn battle was hardly less effectual than acknowledged victory. Instead of being crushed under ridicule, the new theories secured a hearing, all the wider, indeed, for the startling nature of their defence.

## CHAPTER XV

1860-1863

IN the autumn he set to work to make good his promise of demonstrating the existence in the simian brain of the structures alleged to be exclusively human. The result was seen in his papers "On the Zoological Relations of Man with the Lower Animals" (*Nat. Hist. Rev.*, 1861, pp. 67-68); "On the Brain of *Ateles Paniscus*," which appeared in the *Proceedings of the Zoological Society* for 1861, and on "*Nyctipithecus*" in 1862, while similar work was undertaken by his friends Rolleston and Flower. But the brain was only one point among many, as, for example, the hand and the foot in man and the apes; and he already had in mind the discussion of the whole question comprehensively. On January 6 he writes to Sir J. Hooker:—

Some of these days I shall look up the ape question again and go over the rest of the organisation in the same way. But in order to get a thorough grip of the question I must examine into a good many points for myself. The results, when they do come out, will, I foresee, astonish the natives.

Full of interest in this theme, he made it the subject of his popular lectures in the spring of 1861.

Thus from February to May he lectured weekly to working men on "The Relation of Man to the rest of the Animal Kingdom," and on March 22 writes to his wife:—

My working men stick by me wonderfully, the house being fuller than ever last night. By next Friday evening they will all be convinced that they are monkeys. . . . Said lecture, let me inform you, was very good. Lyell came and was rather astonished at the magnitude and attentiveness of the audience.

These lectures to working men were published in the *Natural History Review*, as was a Friday evening discourse

at the Royal Institution (February 8) on "The Nature of the Earliest Stages of Development of Animals."

Meanwhile the publication of these researches led to another pitched battle, in which public interest was profoundly engaged. The controversy which raged had some resemblance to a duel over a point of honour and credit. Scientific technicalities became the catchwords of society, and the echoes of the great Hippocampus question linger in the delightful pages of the *Water-Babies*. Of this fight Huxley writes to Sir J. Hooker on April 18, 1861:—

A controversy between Owen and myself, which I can only call absurd (as there is no doubt whatever about the facts), has been going on in the *Athenæum*, and I wound it up in disgust last week.

And again on April 27:—

Owen occupied an entirely untenable position—but I am nevertheless surprised he did not try "abusing plaintiff's attorney." The fact is he made a prodigious blunder in commencing the attack, and now his only chance is to be silent and let people forget the exposure. I do not believe that in the whole history of science there is a case of any man of reputation getting himself into such a contemptible position. He will be the laughing-stock of all the continental anatomists.

Rolleston has a great deal of Oxford slough to shed, but on that very ground his testimony has been of most especial service. Fancy that man — telling Maskelyne that Rolleston's observations were entirely confirmatory of Owen.

About the same time he writes to his wife:—

*April 16.*—People are talking a good deal about the "Man and the Apes" question, and I hear that somebody, I suspect Monckton Milnes, has set afloat a poetical squib on the subject.\* . . .

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\* The squib in question, dated "the Zoological Gardens," and signed "Gorilla," appeared in *Punch* for May 15, 1861, under a picture of that animal, bearing the sign, "Am I a Man and a Brother?"

The concluding verses run as follows:

Next *HUXLEY* replies  
That *OWEN* he lies  
And garbles his Latin quotation;  
That his facts are not new,  
His mistakes not a few,  
Detrimental to his reputation.

"To twice slay the slain"  
By dint of the Brain  
(Thus *HUXLEY* concludes his review),  
Is but labour in vain,  
Unproductive of gain,  
And so I shall bid you "Adieu!"

Some think my winding-up too strong, but I trust the day will never come when I shall abstain from expressing my contempt for those who prostitute Science to the Service of Error. At anyrate I am not old enough for that yet. Darwin came in just now. I get no scoldings for pitching into the common enemy now!!

I would give you fifty guesses (he writes to Hooker on April 30), and you should not find out the author of the *Punch* poem. I saw it in MS. three weeks ago, and was told the author was a friend of mine. But I remained hopelessly in the dark till yesterday. What do you say to Sir Philip Egerton coming out in that line? I am told he is the author, and the fact speaks volumes for Owen's perfect success in damning himself.

In the midst of the fight came a surprising invitation. On April 10 he writes to his wife:—

They have written to me from the Philosophical Institute of Edinburgh to ask me to give two lectures on the "Relation of Man to the Lower Animals" next session. I have replied that if they can give me January 3 and 7 for lecture days I will do it—if not, not. Fancy unco guid Edinburgh requiring illumination on the subject! They know my views, so if they do not like what I shall have to tell them, it is their own fault.

These lectures were eventually delivered on January 4 and 7, 1862, and were well reported in the Edinburgh papers. The substance of them appears as Part 2 in *Man's Place in Nature*, the first lecture describing the general nature of the process of development among vertebrate animals, and the modifications of the skeleton in the mammalia; the second dealing with the crucial points of comparison between the higher apes and man, viz. the hand, foot, and brain. He showed that the differences between man and the higher apes were no greater than those between the higher and lower apes. If the Darwinian hypothesis explained the common ancestry of the latter, the anatomist would have no difficulty with the origin of man, so far as regards the gap between him and the higher apes.

Yet, though convinced that "that hypothesis is as near an approximation to the truth as, for example, the Copernican hypothesis was to the true theory of the planetary

motions," he steadfastly refused to be an advocate of the theory, "if by an advocate is meant one whose business it is to smooth over real difficulties, and to persuade when he cannot convince."

In common fairness he warned his audience of the one missing link in the chain of evidence—the fact that selective breeding has not yet produced species sterile to one another. But it is to be adopted as a working hypothesis like other scientific generalisations, "subject to the production of proof that physiological species may be produced by selective breeding; just as a physical philosopher may accept the undulatory theory of light, subject to the proof of the existence of the hypothetical ether; or as the chemist adopts the atomic theory, subject to the proof of the existence of atoms; and for exactly the same reasons, namely, that it has an immense amount of *prima facie* probability; that it is the only means at present within reach of reducing the chaos of observed facts to order; and lastly, that it is the most powerful instrument of investigation which has been presented to naturalists since the invention of the natural system of classification, and the commencement of the systematic study of embryology."

As for the repugnance of most men to admitting kinship with the apes, "thoughtful men," he says, "once escaped from the blinding influences of traditional prejudices, will find in the lowly stock whence man has sprung the best evidence of the splendour of his capacities; and will discern, in his long progress through the past, a reasonable ground of faith in his attainment of a nobler future."

A simile, with which he enforced this elevating point of view, which has since eased the passage of many minds to the acceptance of evolution, seems to have been much appreciated by his audience. It was a comparison of man to the Alps, which turn out to be "of one substance with the dullest clay, but raised by inward forces to that place of proud and seemingly inaccessible glory."

The lectures were met at first with astonishing quiet, but it was not long before the stones began to fly. The *Witness* of January 11 lashed itself into a fury over the fact



that the audience applauded this "anti-scriptural and most debasing theory . . . standing in blasphemous contradiction to biblical narrative and doctrine," instead of expressing their resentment at this "foul outrage committed upon them individually, and upon the whole species as 'made in the likeness of God,'" by deserting the hall in a body, or using some more emphatic form of protest against the corruption of youth by "the vilest and beastliest paradox ever vented in ancient or modern times amongst Pagans or Christians." In his finest vein of sarcasm, the writer expresses his surprise that the meeting did not instantly resolve itself into a "Gorilla Emancipation Society," or propose to hear a lecture from an apostle of Mormonism; "even this would be a less offensive, mischievous, and inexcusable exhibition than was made in the recent two lectures by Professor Huxley," etc.

JERMYN STREET, *January 13, 1862.*

MY DEAR DARWIN—In the first place a new year's greeting to you and yours. In the next, I enclose this slip (please return it when you have read it) to show you what I have been doing in the north.

Everybody prophesied I should be stoned and cast out of the city gate, but, on the contrary, I met with unmitigated applause!! Three cheers for the progress of liberal opinion!!

The report is as good as any, but they have not put quite rightly what I said about your views, respecting which I took my old line about the infertility difficulty.

Furthermore, they have not reported my statement that whether you were right or wrong, some form of the progressive development theory is certainly true. Nor have they reported here my distinct statement that I believe man and the apes to have come from one stock.

Having got thus far, I find the lecture better reported in the *Courant*, so I send you that instead.

I mean to publish the lecture in full by and by (about the time the orchids come out).—Ever yours faithfully,

T. H. HUXLEY.

I deserved the greatest credit for not having made an onslaught on Brewster for his foolish impertinence about your views in *Good Words*, but declined to stir nationality, which you know (in him) is rather more than his Bible.

JERMYN STREET, *January 16, 1862.*

MY DEAR HOOKER—I wonder if we are ever to meet again in this world! At anyrate I send to the remote province of Kew, Greeting, and my best wishes for the new year to you and yours. I also inclose a slip from an Edinburgh paper containing a report of my lecture on the "Relation of Man," etc. As you will see, I went in for the entire animal more strongly, in fact, than they have reported me. I told them in so many words that I entertained no doubt of the origin of man from the same stock as the apes.

And to my great delight, in saintly Edinburgh itself the announcement met with nothing but applause. For myself I can't say that the praise or blame of my audience was much matter, but it is a grand indication of the general disintegration of old prejudices which is going on.

I shall see if I cannot make something more of the lectures by delivering them again in London, and then I shall publish them.

The report does not put nearly strong enough what I said in favour of Darwin's views. I affirmed it to be the only scientific hypothesis of the origin of species in existence, and expressed my belief that the one gap in the evidence would be filled up, as I always do.—Ever yours faithfully,

T. H. HUXLEY.

JERMYN STREET, *January 20, 1862.*

MY DEAR DARWIN—The inclosed article, which has been followed up by another more violent, more scurrilously personal, and more foolish, will prove to you that my labour has not been in vain, and that your views and mine are likely to be better ventilated in Scotland than they have been.

I was quite uneasy at getting no attack from the *Witness*, thinking I must have overestimated the impression I had made, and the favourableness of the reception of what I said. But the raving of the *Witness* is clear testimony that my notion was correct.

I shall send a short reply to the *Scotsman* for the purpose of further advertising the question.

With regard to what are especially your doctrines, I spoke much more favourably than I am reported to have done. I expressed no doubt as to their ultimate establishment, but as I particularly wished not to be misrepresented as an advocate trying to soften or explain away real difficulties, I did not in speaking enter into the details of what is to be said in diminish-

ing the weight of the hybrid difficulty. All this will be put fully when I print the Lecture.

The arguments put in your letter are those which I have urged to other people — of the opposite side — over and over again. I have told my students that I entertain no doubt that twenty years' experiments on pigeons conducted by a skilled physiologist, instead of by a mere breeder, would give us physiological species sterile *inter se*, from a common stock (and in this, if I mistake not, I go further than you do yourself), and I have told them that when these experiments have been performed I shall consider your views to have a complete physical basis, and to stand on as firm ground as any physiological theory whatever.

It was impossible for me, in the time I had, to lay all this down to my Edinburgh audience, and in default of full explanation it was far better to seem to do scanty justice to you. I am constitutionally slow of adopting any theory that I must needs stick by when I have once gone in for it; but for these two years I have been gravitating towards your doctrines, and since the publication of your primula paper with accelerated velocity. By about this time next year I expect to have shot past you, and to find you pitching into me for being more Darwinian than yourself. However, you have set me going, and must just take the consequences, for I warn you I will stop at no point so long as clear reasoning will carry me further.

My wife and I were very grieved to hear you had had such a sick house, but I hope the change in the weather has done you all good. Anything is better than the damp warmth we had.

I will take great care of the three "Barriers."\* I wanted to cut it up in the *Saturday*, but how I am to fulfil my benevolent intentions—with five lectures a week—a lecture at the Royal Institution and heaps of other things on my hands, I don't know.  
—Ever yours faithfully,  
T. H. HUXLEY.

I am very glad to hear about Brown Séquard; he is a thoroughly good man, and told me it was worth while to come all the way to Oxford to hear the Bishop pummelled.

In the above-mentioned letter to the *Scotsman* of January 24 he expresses his unfeigned satisfaction at the fulfil-

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\* A pamphlet called "The Three Barriers, by G. R., being notes on Mr. Darwin's *Origin of Species*, 1861, 8vo." Habitat, structure, and procreative power are given, as these three barriers to Darwinism, against which natural theology takes its stand on Final Causes.

ment of the three objects of his address, namely, to state fully and fairly his conclusions, to avoid giving unnecessary offence, and thirdly, "while feeling assured of the just and reasonable dealing of the respectable part of the Scottish press, I naturally hoped for noisy injustice and unreason from the rest, seeing, as I did, the best security for the dissemination of my views through regions which they might not otherwise reach, in the certainty of a violent attack by (the *Witness*)."

The applause of the audience, he says, afforded him genuine satisfaction, "because it bids me continue in the faith on which I acted, that a man who speaks out honestly and fearlessly that which he knows, and that which he believes, will always enlist the good-will and the respect, however much he may fail in winning the assent, of his fellow-men."

About this time a new field of interest was opened out to him, closely connected with, indeed, and completing, the ape question. Sir Charles Lyell was engaged in writing his *Antiquity of Man*, and asked Huxley to supply him with various anatomical data touching the ape question, and later to draw him a diagram illustrating the peculiarities of the newly discovered Neanderthal skull as compared with other skulls. He points out in his letters to Lyell that the range of cranial capacity between the highest and the lowest German—"one of the mediatised princes, I suppose"—\*—or the Malayan or Peruvian, is almost 100 per cent; in absolute amount twice as much as the difference between that of the largest simian and the smallest human capacity, so that in seeking an ordinal difference between man and the apes, "it would certainly be well to let go the head, though I am afraid it does not mend matters much to lay hold of the foot."

And on January 25, 1862:—

I have been skull-measuring all day at the College of Surgeons. The *Neanderthal skull* may be described as a slightly

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\* The minor princes of Germany, whose territories were annexed to larger states, and who thus exchanged a direct for a mediate share in the imperial government.

exaggerated modification of one of the two types (and the lower) of Australian skulls.

After the fashion of accounting for the elephant of old, I suppose it will be said that it was imported. But luckily the differences, though only of degree, are rather too marked for this hypothesis.

I only wish I had a clear six months to work at the subject. Little did I dream what the undertaking to arrange your three woodcuts would lead to. It will come in the long-run, I believe, to a new ethnological method, new modes of measurement, a new datum line, and new methods of registration.

If one had but two heads and neither required sleep!

One immediate result of his investigations, which appeared in a lecture at the Royal Institution (February 7, 1862), "On the Fossil Remains of Man," was incorporated in *Man's Place in Nature*. But a more important consequence of this impulse was that he went seriously into the study of Ethnology. Of his work in this branch of natural science, Professor Virchow, speaking at the dinner given him by the English medical profession on October 5, 1898, declared that in the eyes of German savants it alone would suffice to secure immortal reverence for his name.

The concluding stage in the long controversy raised first at Oxford, was the British Association meeting at Cambridge in 1862. It was here that Professor (afterwards Sir W. H.) Flower made his public demonstration of the existence in apes of the cerebral characters said to be peculiar to man.

From the 1st to the 9th of October Huxley stayed at Cambridge as the guest of Professor Fawcett at Trinity Hall, running over to Felixstow on the 5th to see his wife, whose health did not allow her to accompany him.

As President of Section D he had a good deal to do, and he describes the course of events in a letter to Darwin:—

26 ABBEY PLACE, Oct. 9, 1862.

MY DEAR DARWIN—It is a source of sincere pleasure to me to learn that anything I can say or do is a pleasure to you, and I was therefore very glad to get your letter at that whirligig of

an association meeting the other day. We all missed you, but I think it was as well you did not come, for though I am pretty tough, as you know, I found the pace rather killing. Nothing could exceed the hospitality and kindness of the University people—and that, together with a great deal of speaking on the top of a very bad cold, which I contrived to catch just before going down, has somewhat used me up.

Owen came down with the obvious intention of attacking me on all points. Each of his papers was an attack, and he went so far as to offer stupid and unnecessary opposition to proposals of mine in my own committee. However, he got himself sold at all points. . . . The *Polypterus* paper and the *Aye-Aye* paper fell flat. The latter was meant to raise a discussion on your views, but it was all a stale hash, and I only made some half sarcastic remarks which stopped any further attempts at discussion. . . .

I took my book to Scotland but did nothing. I shall ask leave to send you a bit or two as I get on.—Ever yours,

T. H. HUXLEY.

A “Society for the propagation of common honesty in all parts of the world” was established at Cambridge. I want you to belong to it, but I will say more about it by and by.

This admirable society, which was also to “search for scientific truth, especially in biology,” seems to have been but short lived. At all events, I can find only two references to subsequent meetings, on October 7 and December 19 in this year.

A few days later a final blow was struck in the battle over the ape question. He writes on October 15 how he has written a letter to the *Medical Times*—his last word on the subject, summing up in most emphatic terms:—

I have written the letter with the greatest care, and there is nothing coarse or violent in it. But it shall put an end to all the humbug that has been going on. . . . Rolleston will come out with his letter in the same number, and the smash will be awful, but most thoroughly merited.

These several pieces of work, struck out at different times in response to various impulses, were now combined and re-shaped into *Man's Place in Nature*, the first book which was published by him. Thus he writes to Sir Charles Lyell on May 5, 1862:—

Of course I shall be delighted to discuss anything with you,\* and the more so as I mean to put the whole question before the world in another shape in my little book, whose title is announced as *Evidences as to Man's Place in Nature*. I have written the first two essays, the second containing the substance of my Edinburgh Lecture. I recollect you once asked me for something to quote on the Man question, so if you want anything in that way the MS. is at your service.

Lyell looked over the proofs, and the following letters are in reply to his criticisms:—

ARDRISHAIG, LOCH FYNE, *Aug. 17, 1862.*

MY DEAR SIR CHARLES—I take advantage of my first quiet day to reply to your letter of the 9th; and in the first place let me thank you very much for your critical remarks, as I shall find them of great service.

With regard to such matters as verbal mistakes, you must recollect that the greater part of the proof was wholly uncorrected. But the reader might certainly do his work better. I do not think you will find room to complain of any want of distinctness in my definition of Owen's position touching the Hippocampus question. I mean to give the whole history of the business in a note, so that the paraphrase of Sir Ph. Egerton's line "To which Huxley replies that Owen he lies," shall be unmistakable.†

I will take care about the Cheiroptera, and I will look at Lamarck again. But I doubt if I shall improve my estimate of the latter. The notion of common descent was not his—still less that of modification by variation—and he was as far as De Maillet from seeing his way to any *vera causa* by which varieties might be intensified into species.

If Darwin is right about natural selection—the discovery of this *vera causa* sets him to my mind in a different region altogether from all his predecessors—and I should no more call his doctrine a modification of Lamarck's than I should call the Newtonian theory of the celestial motions a modification of the Ptolemaic system. Ptolemy imagined a mode of explaining those motions. Newton proved their necessity from the laws and a force demonstrably in operation. If he is only right Dar-

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\* Referring to the address on "Geological Contemporaneity" delivered in 1862 at the Geological Society, see p. 220.

† See p. 206.

win will, I think, take his place with such men as Harvey, and even if he is wrong his sobriety and accuracy of thought will put him on a far different level from Lamarck. I want to make this clear to people.

I am disposed to agree with you about the "emasculate" and "uncircumcised"—partly for your reasons, partly because I believe it is an excellent rule always to erase anything that strikes one as particularly smart when writing it. But it is a great piece of self-denial to abstain from expressing my peculiar antipathy to the people indicated, and I hope I shall be rewarded for the virtue.

As to the secondary causes I only wished to guard myself from being understood to imply that I had any comprehension of the meaning of the term. If my phrase looks naughty I will alter it. What I want is to be read, and therefore to give no unnecessary handle to the enemy. There will be row enough whatever I do.

Our Commission here \* implicates us in an inquiry of some difficulty, and which involves the interests of a great many poor people. I am afraid it will not leave me very much leisure. But we are in the midst of a charming country, and the work is not unpleasant or uninteresting. If the sun would only shine more than once a week it would be perfect.—With kind remembrances to Lady Lyell, believe me, faithfully yours,

T. H. HUXLEY.

We shall be here for the next ten days at least. But my wife will always know my whereabouts.

JERMYN STREET, *March 23, 1863.*

MY DEAR SIR CHARLES—I suspect that the passage to which you refer must have been taken from my unrevised proofs, for it corresponds very nearly with what is written at p. 97 of my book.

Flower has recently discovered that the Siamang's brain affords an even more curious exception to the general rule than that of *Mycetes*, as the cerebral hemispheres leave part not only of the sides but of the hinder end of the cerebellum uncovered.

As it is one of the Anthropoid apes and yet differs in this respect far more widely from the gorilla than the gorilla differs from man, it offers a charming example of the value of cerebral characters.

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\* The Fishery Commission.



Flower publishes a paper on the subject in the forthcoming number of the *N. H. Review*.

Might it not be well to allude to the fact that the existence of the posterior lobe, posterior cornu, and hippocampus in the Orang has been publicly demonstrated to an audience of experts at the College of Surgeons?—Ever yours faithfully,

T. H. HUXLEY.

The success of *Man's Place* was immediate, despite such criticisms as that of the *Athenæum*, that "Lyell's object is to make man old, Huxley's to degrade him." By the middle of February it reached its second thousand; in July it is heard of as republished in America; at the same time L. Buchner writes that he wished to translate it into German, but finds himself forestalled by Victor Carus. From another aspect, Lord Enniskillen, thanking him for the book, says (March 3), "I believe you are already excommunicated by book, bell, and candle," while in an undated note, Bollaert writes, "The Bishop of Oxford the other day spoke about 'the church having been in danger of late, by such books as Colenso's, but that it (the church) was now restored.' And this at a time, he might have added, when the works of Darwin, Lyell, and Huxley are torn from the hands of Mudie's shopmen, as if they were novels—(see *Daily Telegraph*, April 10)."

At the same time, the impression left by his work upon the minds of the leading men of science may be judged from a few words of Sir Charles Lyell, who writes to a friend on March 15, 1863 (*Life and Letters*, ii. 366):—

Huxley's second thousand is going off well. If he had leisure like you and me, and the vigour and logic of the lectures, and his address to the Geological Society, and half a dozen other recent works (letters to the *Times* on Darwin, etc.), had been all in one book, what a position he would occupy! I entreated him not to undertake the *Natural History Review* before it began. The responsibility all falls on the man of chief energy and talent; it is a quarterly mischief, and will end in knocking him up.

A similar estimate appears from an earlier letter of March 11, 1859 (*Life and Letters*, ii. 321), when he quotes Huxley's

opinion of Mansel's Bampton Lectures on the *Limits of Religious Thought*:—

A friend of mine, Huxley, who will soon take rank as one of the first naturalists we have ever produced, begged me to read these sermons as first rate, "although, regarding the author as a churchman, you will probably compare him, as I did, to the drunken fellow in Hogarth's contested election, who is sawing through the signpost at the other party's public-house, forgetting he is sitting at the other end of it. But read them as a piece of clear and unanswerable reasoning."

In the 1894 preface to the re-issue of *Man's Place* in the Collected Essays, Huxley speaks as follows of the warnings he received against publishing on so dangerous a topic, of the storm which broke upon his head, and the small result which, in the long run, it produced\*:

*Magna est veritas et prævalebit!* Truth is great, certainly, but considering her greatness, it is curious what a long time she is apt to take about prevailing. When, towards the end of 1862, I had finished writing *Man's Place in Nature*, I could say with a good conscience that my conclusions "had not been formed hastily or enunciated crudely." I thought I had earned the right to publish them, and even fancied I might be thanked rather than reproved for doing so. However, in my anxiety to publish nothing erroneous, I asked a highly competent anatomist and very good friend of mine to look through my proofs, and, if he could, point out any errors of fact. I was well pleased when he returned them without criticism on that score; but my satisfaction was speedily dashed by the very earnest warning as to the consequences of publication, which my friend's interest in my welfare led him to give. But, as I have confessed elsewhere, when I was a young man, there was just a little—a mere *souçon*—in my composition of that tenacity of purpose which has another name; and I felt sure that all the evil things prophesied would not be so painful to me as the giving up that which I had resolved to do, upon grounds which I conceived to be right.\*

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\* In September 1887 he wrote to Mr. Edward Clodd—"All the propositions laid down in the wicked book, which was so well anathematised a quarter of a century ago, are now taught in the text-books. What a droll world it is!"

† As to this advice not to publish *Man's Place* for fear of misrepresentation on the score of morals, he said, in criticising an attack of

So the book came out; and I must do my friend the justice to say that his forecast was completely justified. The Boreas of criticism blew his hardest blasts of misrepresentation and ridicule for some years, and I was even as one of the wicked. Indeed, it surprises me at times to think how anyone who had sunk so low could since have emerged into, at any rate, relative respectability. Personally, like the non-covine personages in the Ingoldsby legend, I did not feel "one penny the worse." Translated into several languages, the book reached a wider public than I had ever hoped for; being largely helped, I imagine, by the Ernulphine advertisements to which I referred. It has had the honour of being freely utilised without acknowledgment by writers of repute; and finally it achieved the fate, which is the euthanasia of a scientific work, of being inclosed among the rubble of the foundations of later knowledge, and forgotten.

To my observation, human nature has not sensibly changed during the last thirty years. I doubt not that there are truths as plainly obvious and as generally denied as those contained in *Man's Place in Nature*, now awaiting enunciation. If there is a young man of the present generation who has taken as much trouble as I did to assure himself that they are truths, let him come out with them, without troubling his head about the barking of the dogs of St. Ernulphus. *Veritas prævalebit*—some day; and even if she does not prevail in his time, he himself will be all the better and wiser for having tried to help her. And let him recollect that such great reward is full payment for all his labour and pains.

The following letter refers to the newly published *Man's Place in Nature*. Miss H. Darwin had suggested a couple of corrections:—

JERMYN STREET, Feb. 25, 1863.

MY DEAR DARWIN—Please to say to Miss Henrietta Minos Rhadamanthus Darwin that I plead guilty to the justice of both criticisms, and throw myself on the mercy of the court.

As extenuating circumstances with respect to indictment No. 1, see prefatory notice. Extenuating circumstance No. 2

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this sort made upon Darwin in the *Quarterly* for July 1876:—"It seemed to me, however, that a man of science has no *raison d'être* at all, unless he is willing to face much greater risks than these for the sake of that which he believes to be true; and further, that to a man of science such risks do not count for much—that they are by no means so serious as they are to a man of letters, for example."

—that I picked up “Atavism” in Pritchard years ago, and as it is a much more convenient word than “Hereditary transmission of variations,” it slipped into equivalence in my mind, and I forgot all about the original limitation.

But if these excuses should in your judgment tend to aggravate my offences, suppress 'em like a friend. One may always hope more from a lady's tender-heartedness than from her sense of justice.

Publisher has just sent to say that I must give him any corrections for second thousand of my booklet immediately.

Why did not Miss Etty send any critical remarks on that subject by the same post? I should be most immensely obliged for them.—Ever yours faithfully,  
T. H. HUXLEY.

During this period of special work at the anthropological side of the Evolution theory, Huxley made two important contributions to the general question.

As secretary of the Geological Society, the duty of delivering the anniversary address in 1862 fell to him in the absence of the president, Leonard Horner, who had been driven by ill-health to winter in Italy.

The object at which he aimed appears from the postscript of a brief note of Feb. 19, 1862, to Hooker:—

I am writing the body of the address, and I am going to criticise Palæontological doctrines in general in a way that will flutter their nerves considerable.

Darwin is met everywhere with — Oh this is opposed to palæontology, or that is opposed to palæontology—and I mean to turn round and ask, “Now, Messieurs les Palæontologues, what the devil *do* you really know?”

I have not changed sex, although the postscript is longer than the letter.

The delivery of the address \* itself on February 21 is thus described by Sir Charles Lyell † (*Life and Letters*, ii. 356):—

Huxley delivered a brilliant critical discourse on what palæontology has and has not done, and proved the value of

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\* On “Geological Contemporaneity” (*Coll. Ess.* viii. 292).

† To a note of whose, proposing a talk over the subject, Huxley replies on May 5, “I am very glad you find something to think about in my address. That is the best of all praise.”

negative evidence, how much the progressive development system has been pushed too far, how little can be said in favour of Owen's more generalised types when we go back to the vertebrata and invertebrata of remote ages, the persistency of many forms high and low throughout time, how little we know of the beginning of life upon the earth, how often events called contemporaneous in Geology are applied to things which, instead of coinciding in time, may have happened ten millions of years apart, etc.; and a masterly sketch comparing the past and present in almost every class in zoology, and sometimes of botany cited from Hooker, which he said he had done because it was useful to look into the cellars and see how much gold there was there, and whether the quantity of bullion justified such an enormous circulation of paper. I never remember an address listened to with such applause, though there were many private protests against some of his bold opinions.

The dinner at Willis's was well attended; I should think eighty or more present . . . and late in the evening Huxley made them merry by a sort of mock-modest speech.

JERMYN STREET, *May 6, 1862.*

MY DEAR DARWIN—I was very glad to get your note about my address. I profess to be a great stoic, you know, but there are some people from whom I am glad to get a pat on the back. Still I am not quite content with that, and I want to know what you think of the argument—whether you agree with what I say about contemporaneity or not, and whether you are prepared to admit—as I think your views compel you to do—that the whole Geological Record is only the skimmings of the pot of life.

Furthermore, I want you to chuckle with me over the notion I find a great many people entertain—that the address is dead against your views. The fact being, as they will by and by wake up [to] see that yours is the only hypothesis which is not negatived by the facts,—one of its great merits being that it allows not only of indefinite standing still, but of indefinite retrogression.

I am going to try to work the whole argument into an intelligible form for the general public as a chapter of my forthcoming "Evidence" \* (one half of which I am happy to say is now written), so I shall be very glad of any criticisms or hints.

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\* *Evidence as to Man's Place in Nature.*

Since I saw you—indeed, from the following Tuesday onwards—I have amused myself by spending ten days or so in bed. I had an unaccountable prostration of strength which they called influenza, but which, I believe, was nothing but some obstruction in the liver.

Of course I can't persuade people of this, and they will have it that it is overwork. I have come to the conviction, however, that steady work hurts nobody, the real destroyer of hardworking men being not their work, but dinners, late hours, and the universal humbug and excitement of society.

I mean to get out of all that and keep out of it.—Ever yours faithfully,  
T. H. HUXLEY.

The other contribution to the general question was his Working Men's Lectures for 1862. As he writes to Darwin on October 10—"I can't find anything to talk to the working men about this year but your book. I mean to give them a commentary *à la* Coke upon Lyttleton."

The lectures to working men here referred to, six in number, were duly delivered once a week from November 10 onwards, and published in the form of as many little pamphlets. Appearing under the general title, "On our Knowledge of the Causes of the Phenomena of Organic Nature," they wound up with a critical examination of the portion of Mr. Darwin's work *On the Origin of Species*, in relation to the complete theory of the causes of organic nature.

JERMYN STREET, Dec. 2, 1862.

MY DEAR DARWIN—I send you by this post three of my working men's lectures now in course of delivery. As you will see by the prefatory notice, I was asked to allow them to be taken down in shorthand for the use of the audience, but I have no interest in them, and do not desire or intend that they should be widely circulated.

Some time hence, may be, I may revise and illustrate them, and make them into a book as a sort of popular exposition of your views, or at any rate of my version of your views.

There really is nothing new in them nor anything worth your attention, but if in glancing over them at any time you should see anything to object to, I should like to know.

I am very hard worked just now—six lectures a week, and no end of other things—but as vigorous as a three-year old.

Somebody told me you had been ill, but I hope it was fiction, and that you and Mrs. Darwin and all your belongings are flourishing.—Ever yours faithfully,  
T. H. HUXLEY.

In reply, Darwin writes on December 10:—

I agree entirely with all your reservations about accepting the doctrine, and you might have gone further with perfect safety and truth. . . .

Touching the *Natural History Review*, "Do inaugurate a great improvement, and have pages cut, like the Yankees do; I will heap blessings on your head."

And again, December 18:—

I have read No. IV. and V. They are simply perfect. They ought to be largely advertised; but it is very good in me to say so, for I threw down No. IV. with this reflection, "What is the good of my writing a thundering big book, when everything is in this green little book so despicable for its size?" In the name of all that is good and bad I may as well shut up shop altogether.

These lectures met with an annoying amount of success. They were not cast into permanent form, for he grudged the time necessary to prepare them for the press. However, he gave a Mr. Hardwicke permission to take them down in shorthand as delivered for the use of the audience. But no sooner were they printed, than they had a large sale. Writing to Sir J. D. Hooker early in the following month, he says:—

I fully meant to have sent you all the successive lectures as they came out, and I forward a set with all manner of apologies for my delinquency. I am such a 'umble-minded party that I never imagined the lectures as delivered would be worth bringing out at all, and I knew I had no time to work them out. Now, I lament I did not publish them myself and turn an honest penny by them as I suspect Hardwicke is doing. He is advertising them everywhere, confound him.

I wish when you have read them you would tell me whether you think it would be worth while for me to re-edit, enlarge, and illustrate them by and by.

And on January 28 Sir C. Lyell writes to him:—

I do grudge Hardwicke very much having not only the publisher's but the author's profits. It so often happens that popular lectures designed for a class and inspired by an attentive audience's sympathy are better than any writing in the closet for the purpose of educating the many as readers, and of remunerating the publisher and author. I would lose no time in considering well what steps to take to rescue the copyright of the third thousand.

As for the value of the work thus done in support of Darwin's theory, it is worth while quoting the words of Lord Kelvin, when, as President of the Royal Society in 1894, it fell to him to award Huxley the Darwin Medal:—

To the world at large, perhaps, Mr. Huxley's share in moulding the thesis of *Natural Selection* is less well known than is his bold unwearied exposition and defence of it after it had been made public. And, indeed, a speculative trifler, revelling in the problems of the "might have been," would find a congenial theme in the inquiry how soon what we now call "Darwinism" would have met with the acceptance with which it has met, and gained the power which it has gained, had it not been for the brilliant advocacy with which in its early days it was expounded to all classes of men.

That advocacy had one striking mark: while it made or strove to make clear how deep the new view went down, and how far it reached, it never shrank from trying to make equally clear the limit beyond which it could not go.



## CHAPTER XVI

1860-1861

THE letters given in the following chapters illustrate the occupations and interests of the years 1860 to 1863, apart from the struggle over the species question.

One of the most important and most engrossing was the launching of a scientific quarterly to do more systematically and thoroughly what had been done since 1858 in the fortnightly scientific column of the *Saturday Review*. Its genesis is explained in the following letter:—

*July 17, 1860.*

MY DEAR HOOKER—Some time ago Dr. Wright of Dublin talked to me about the *Natural History Review*, which I believe to a great extent belongs to him, and wanted me to join in the editorship, provided certain alterations were made. I promised to consider the matter, and yesterday he and Greene dined with me, and I learned that Haughton and Galbraith were out of the review—that Harvey was likely to go—that a new series was to begin in January, with Williams and Norgate for publishers over here—that it was to become an English and not a Hibernian concern in fact—and finally, that if I chose to join as one of the editors, the effectual control would be pretty much in my own hands. Now, considering the state of the times, and the low condition of natural history journalisation (always excepting quarterly *Mic. Jour.*) in this country this seems to me to be a fine opening for a plastically minded young man, and I am decidedly inclined to close with the offer, though I shall get nothing but extra work by it.

To limit the amount of this extra work, however, I must get co-editors, and I have written to Lubbock and to Rolleston (also plastically minded young men) to see if they will join. Now up to this point you have been in a horrid state of disgust, because

you thought I was going to ask you next. But I am not, for rejoiced as I should be to have you, I know you have heaps of better work to do, and hate journalism.

But can you tell me of any plastic young botanist who would come in all for glory and no pay, though I think pay may be got if the concern is properly worked. How about Oliver?

And though you can't and won't be an editor yourself, won't you help us and pat us on the back?

The tone of the *Review* will be mildly episcopophagous, and you and Darwin and Lyell will have a fine opportunity if you wish it of slaying your adversaries.—Ever yours faithfully,

T. H. HUXLEY.

Several of his elder friends tried to dissuade him from an undertaking which would inevitably distract him from his proper work. Sir C. Lyell prophesied (see p. 217) that all the work would drift to the most energetic member of the staff, and Huxley writes to Hooker, August 2, 1860:—

Darwin wrote me a very kind expostulation about it, telling me I ought not to waste myself on other than original work. In reply, however, I assured him that I *must* waste myself willy-nilly, and that the *Review* was only a save-all.

The more I think of it the more it seems to me it ought to answer if properly conducted, and it ought to be of great use.

The first number appeared in January 1861. Writing on the 6th, Huxley says:—

It is pleasant to get such expressions of opinion as I have had from Lyell and Darwin about the *Review*. They make me quite hopeful about its prosperity, as I am sure we shall be able to do better than our first number.

It was not long, however, before Lyell's prophecy began to come true. In June Huxley writes:—

It is no use letting other people look after the journal. I find unless I revise every page of it, it goes wrong.

But in July 1863 he definitely ceased to contribute:—

I did not foresee all this crush of work, (he writes) when the *Review* was first started, or I should not have pledged myself to any share in supplying it. (Moreover, with the appointment

of paid editors that year, it seemed to him) that the working editors with the credit and the pay must take the responsibility of all the commissariat of the *Review* upon their shoulders.

Two years later, in 1865, the *Review* came to an end. As Mr. Murray, the publisher, remarked, quarterlies did not pay; and this quarterly became still more financially unsound after the over-worked volunteers, who both edited and contributed, gave place to paid editors.

But Huxley was not satisfied with one defeat. The quarterly scheme had failed; he now tried if he could not serve science better by returning to a more frequent and more popular form of periodical. From 1863 to 1866 he was concerned with the *Reader*, a weekly issue; \* but this also was too heavy a burden to be borne in addition to his other work. However, the labour expended in these ventures was not wholly thrown away. The experience thus gained at last enabled the present Sir Norman Lockyer, who acted as science editor for the *Reader*, to realise what had so long been aimed at by the establishment of *Nature* in 1869.

Apart from his contributions to the species question and the foundation of a scientific review, Huxley published in 1860 only two special monographs ("On Jacare and Caiman," and "On the Mouth and Pharynx of the Scorpion," already mentioned as read in the previous year), but he read "Further Observations on *Pyrosoma*" at the Linnean Society, and was busy with paleontological work, the results of which appeared in three papers the following year, the most important of which was the Memoir called a "Preliminary Essay on the Arrangement of the Devonian Fishes," in the report of the Geological Survey, "which," says Sir M. Foster, "though entitled a Preliminary Essay, threw an entirely new light on the affinities of these creatures, and, with the continuation published later, in 1866, still remains a standard work."

The question of the admission of ladies to the learned

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\* The committee also included Professor Cairns, F. Galton, W. F. Pollock, and J. Tyndall.

societies was already being mooted, and a letter to Sir C. Lyell gives his ideas thus early not only on this point, but on the general question of women's education.

March 17, 1860.

MY DEAR SIR CHARLES—To use the only forcible expression, I “twig” your meaning perfectly, but I venture to think the parable does not apply. For the Geological Society is not, to my mind, a place of education for students, but a place of discussion for adepts; and the more it is applied to the former purpose the less competent it must become to fulfil the latter—its primary and most important object.

I am far from wishing to place any obstacle in the way of the intellectual advancement and development of women. On the contrary, I don't see how we are to make any permanent advancement while one-half of the race is sunk, as nine-tenths of women are, in mere ignorant parsonese superstitions; and to show you that my ideas are practical I have fully made up my mind, if I can carry out my own plans, to give my daughters the same training in physical science as their brother will get, so long as he is a boy. They, at any rate, shall not be got up as man-traps for the matrimonial market. If other people would do the like the next generation would see women fit to be the companions of men in all their pursuits—though I don't think that men have anything to fear from their competition. But you know as well as I do that other people won't do the like, and five-sixths of women will stop in the doll stage of evolution to be the stronghold of parsondom, the drag on civilisation, the degradation of every important pursuit with which they mix themselves—“intrigues” in politics, and “friponnes” in science.

If my claws and beak are good for anything they shall be kept from hindering the progress of any science I have to do with.—Ever yours faithfully,  
T. H. HUXLEY.

Three letters to Mr. Spencer show that he had been reading and criticising the proofs of the *First Principles*. With regard to the second letter, which gives reasons for rejecting Mr. Spencer's remarks about the power of inflation in birds during flight, it is curious to note Mr. Spencer's reply:—

How oddly the antagonism comes out even when you are not conscious of it! My authority was Owen! I heard him assign

this cause for the falling of wounded birds in one of his lectures at the College of Surgeons.

14 WAVERLEY PLACE, *Sept.* 3, 1860.

MY DEAR SPENCER—I return your proofs by this post. To my mind nothing can be better than their contents, whether in matter or in manner, and as my wife arrived, independently, at the same opinion, I think my judgment is not one-sided.

There is something calm and dignified about the tone of the whole—which eminently befits a philosophical work which means to live—and nothing can be more clear and forcible than the argument.

I rejoice that you have made a beginning, and such a beginning—for the more I think about it the more important it seems to me that somebody should think out into a connected system the loose notions that are floating about more or less distinctly in all the best minds.

It seems as if all the thoughts in what you have written were my own, and yet I am conscious of the enormous difference your presentation of them makes in my intellectual state. One is thought in the state of hemp yarn, and the other in the state of rope. Work away, then, excellent rope-maker, and make us more ropes to hold on against the devil and the parsons.

For myself I am absorbed in dogs—gone to the dogs in fact—having been occupied in dissecting them for the last fortnight. You do not say how your health is.—Ever yours faithfully,  
T. H. HUXLEY.

*Sept.* 19, 1860.

MY DEAR SPENCER—You will forgive the delay which has occurred in forwarding your proof when I tell you that we have lost our poor little son, our pet and hope. You who knew him well, and know how his mother's heart and mine were wrapped up in him, will understand how great is our affliction. He was attacked with a bad form of scarlet fever on Thursday night, and on Saturday night effusion on the brain set in suddenly and carried him off in a couple of hours. Jessie was taken ill on Friday, but has had the disease quite lightly, and is doing well. The baby has escaped. So end many hopes and plans—sadly enough, and yet not altogether bitterly. For as the little fellow was our greatest joy so is the recollection of him an enduring consolation. It is a heavy payment, but I would buy the four years of him again at the same price. My wife bears up bravely.

I have read your proofs at intervals, and you must not sup-

pose they have troubled me. On the contrary they were at times the only things I could attend to. I agree in the spirit of the whole perfectly. On some matters of detail I had doubts which I am not at present clear-headed enough to think out.

The only thing I object to *in toto* is the illustration which I have marked at p. 24. It is physically impossible that a bird's air-cells should be *distended* with air during flight, unless the structure of the parts is in reality different from anything which anatomists at present know. Blowing into the trachea is not to the point. A bird cannot blow into its own trachea, and it has no mechanism for performing a corresponding action.

A bird's chest is essentially a pair of bellows in which the sternum during rest and the back during flight act as movable wall. The air cells may all be represented as soft-walled bags opening freely into the bellows—there being, so far as anatomists yet know, no valves or corresponding contrivances anywhere except at the glottis, which corresponds with the nozzle and air valve both, of our bellows. But the glottis is always opened when the chest is dilated at each inspiration. How then can the air in any air-cell be kept at a higher tension than the surrounding atmosphere?

Hunter experimented on the uses of the air sacs, I know, but I have not his works at hand. It may be that opening one of the air-cells interferes with flight, but I hold it very difficult to conceive that the interference can take place in the way you suppose. How on earth is a lark to sing for ten minutes together if the air-cells are to be kept distended all the while he is up in the air?

At any rate twenty other illustrations will answer your purpose as well, so I would not select one which may be assailed by a carping fellow like—Yours very faithfully,

T. H. HUXLEY.

Oct. 10, 1860.

MY DEAR SPENCER \*—"A wilful man must have his way," and if you won't let me contribute towards the material guarantees for the success of your book, I must be content to add twelve shillings' worth of moral influence to that I already meant to exert per annum in its favour.

I shall be most glad henceforth, as ever, to help your great

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\* This was written at the time when Mr. Spencer had issued a notice of discontinuance, and when measures were being taken to prevent it.

undertaking in any way I can. The more I contemplate its issues the more important does it seem to me to be, and I assure you that I look upon its success as the business of all of us. So that if it were not a pleasure I should feel it a duty to "push behind" as hard as I can.

Have you seen this quarter's *Westminster*? The opening article on "Neo-Christianity" is one of the most remarkable essays in its way I have ever read. I suppose it must be Newman's. The *Review* is terribly unequal, some of the other articles being absolutely ungrammatically written. What a pity it is it cannot be thoroughly organised.

My wife is a little better, but she is terribly shattered. By the time you come back we shall, I hope, have reverted from our present hospital condition to our normal arrangements, but in any case we shall be glad to see you.—Ever yours faithfully,

T. H. HUXLEY.

The following is, I think, the first reference to his fastidiousness in the literary expression and artistic completeness of his work. As he said in an after-dinner speech at a meeting in aid of the Literary Fund, "Science and literature are not two things, but two sides of one thing." Anything that was to be published he subjected to repeated revision. And thus, apologising to Hooker for his absence, he writes (August 2, 1860)—

I was sorry to have to send an excuse by Tyndall the other day, but I found I must finish the *Pyrosoma* paper, and all last Tuesday was devoted to it, and I fear the next after will have the like fate.

It constantly becomes more and more difficult to me to *finish* things satisfactorily.

To Hooker also he writes a few days later:—

I hope your ear is better; take care of yourself, there's a good fellow. I can't do without you these twenty years. We have a devil of a lot to do in the way of smiting the Amalekites.

Between two men who seldom spoke of their feelings, but let constant intercourse attest them, these words show more than the practical side of their friendship, their community of aims and interests. Quick, strong-willed, and determined as they both were, the fact that they could work

together for over forty years without the shadow of a misunderstanding, presupposes an unusually strong friendship firmly based upon mutual trust and respect as well as liking, the beginning of which Sir J. Hooker thus describes:—

My first meeting your father was in 1851, shortly after his return from the *Rattlesnake* voyage with Captain Stanley. Hearing that I had paid some attention to marine zoology during the voyage of the Antarctic Expedition, he was desirous of showing me the results of his studies of the Oceanic Hydrozoa, and he sought me out in consequence. This and the fact that we had both embarked in the Naval service in the same capacity as medical officers and with the same object of scientific research, naturally led to an intimacy which was undisturbed by a shadow of a misunderstanding for nearly forty-five following years. Curiously enough, our intercourse might have dated from an earlier period by nearly six years had I accepted an appointment to the *Rattlesnake* offered me by Captain Stanley, which, but for my having arranged for a journey to India, might have been accepted.

Returning to the purpose of our interview, the researches Mr. Huxley laid before me were chiefly those on the Salpæ, a much misunderstood group of marine Hydrozoa. Of these I had amused myself with making drawings during the long and often weary months passed at sea on board the *Erebus*, but having other subjects to attend to, I had made no further study of them than as consumers of the vegetable life (Diatoms) of the Antarctic Ocean. Hence his observations on their life-history, habits, and affinities were on almost all points a revelation to me, and I could not fail to recognise in their author all the qualities possessed by a naturalist of commanding ability, industry, and power of exposition. Our interviews, thus commenced, soon ripened into a friendship, which led to an arrangement for a monthly meeting, and in the informal establishment of a club of nine, the other members of which were, Mr. Busk, Dr. Frankland, Mr. Hirst, Sir J. Lubbock, Mr. Herbert Spencer, Dr. Tyndall, and Mr. Spottiswoode.

Just a month after this letter to his friend, the same year which had first brought Huxley public recognition outside his special sphere brought him also the greatest sorrow perhaps of his whole life. I have already spoken



of the sudden death of the little son in whom so much of his own and his wife's happiness was centred. The suddenness of the blow made it all the more crushing, and the mental strain, intensified by the sight of his wife's inconsolable grief, brought him perilously near a complete breakdown. But the birth of another son, on December 11, gave the mother some comfort; and as the result of a friendly conspiracy between her and Dr. Tyndall, Huxley himself was carried off for a week's climbing in Wales between Christmas and the New Year.

His reply to a long letter of sympathy in which Charles Kingsley set forth the grounds of his own philosophy as to the ends of life and the hope of immortality, affords insight into the very depths of his nature. It is a rare outburst at a moment of intense feeling, in which, more completely than in almost any other writing of his, intellectual clearness and moral fire are to be seen uniting in a veritable passion for truth:—

14 WAVERLEY PLACE, *Sept.* 23, 1860.

MY DEAR KINGSLEY—I cannot sufficiently thank you, both on my wife's account and my own, for your long and frank letter, and for all the hearty sympathy which it exhibits—and Mrs. Kingsley will, I hope, believe that we are no less sensible of her kind thought of us. To myself your letter was especially valuable, as it touched upon what I thought even more than upon what I said in my letter to you. My convictions, positive and negative, on all the matters of which you speak, are of long and slow growth and are firmly rooted. But the great blow which fell upon me seemed to stir them to their foundation, and had I lived a couple of centuries earlier I could have fancied a devil scoffing at me and them—and asking me what profit it was to have stripped myself of the hopes and consolations of the mass of mankind? To which my only reply was and is—Oh devil! truth is better than much profit. I have searched over the grounds of my belief, and if wife and child and name and fame were all to be lost to me one after the other as the penalty, still I will not lie.

And now I feel that it is due to you to speak as frankly as you have done to me. An old and worthy friend of mine tried some three or four years ago to bring us together—because, as he said, you were the only man who would do me any good.

Your letter leads me to think he was right, though not perhaps in the sense he attached to his own words.

To begin with the great doctrine you discuss. I neither deny nor affirm the immortality of man. I see no reason for believing in it, but, on the other hand, I have no means of disproving it.

Pray understand that I have no *a priori* objections to the doctrine. No man who has to deal daily and hourly with nature can trouble himself about *a priori* difficulties. Give me such evidence as would justify me in believing anything else, and I will believe that. Why should I not? It is not half so wonderful as the conservation of force, or the indestructibility of matter. Whoso clearly appreciates all that is implied in the falling of a stone can have no difficulty about any doctrine simply on account of its marvellousness. But the longer I live, the more obvious it is to me that the most sacred act of a man's life is to say and to feel, "I believe such and such to be true." All the greatest rewards and all the heaviest penalties of existence cling about that act. The universe is one and the same throughout; and if the condition of my success in unravelling some little difficulty of anatomy or physiology is that I shall rigorously refuse to put faith in that which does not rest on sufficient evidence, I cannot believe that the great mysteries of existence will be laid open to me on other terms. It is no use to talk to me of analogies and probabilities. I know what I mean when I say I believe in the law of the inverse squares, and I will not rest my life and my hopes upon weaker convictions. I dare not if I would.

Measured by this standard, what becomes of the doctrine of immortality?

You rest in your strong conviction of your personal existence, and in the instinct of the persistence of that existence which is so strong in you as in most men.

To me this is as nothing. That my personality is the surest thing I know—may be true. But the attempt to conceive what it is leads me into mere verbal subtleties. I have champed up all that chaff about the ego and the non-ego, about noumena and phenomena, and all the rest of it, too often not to know that in attempting even to think of these questions, the human intellect flounders at once out of its depth.

It must be twenty years since, a boy, I read Hamilton's essay on the unconditioned, and from that time to this, ontological speculation has been a folly to me. When Mansel took up Hamilton's argument on the side of orthodoxy (!) I said he re-

minded me of nothing so much as the man who is sawing off the sign on which he is sitting, in Hogarth's picture. But this by the way.

I cannot conceive of my personality as a thing apart from the phenomena of my life. When I try to form such a conception I discover that, as Coleridge would have said, I only hypostatise a word, and it alters nothing if, with Fichte, I suppose the universe to be nothing but a manifestation of my personality. I am neither more nor less eternal than I was before.

Nor does the infinite difference between myself and the animals alter the case. I do not know whether the animals persist after they disappear or not. I do not even know whether the infinite difference between us and them may not be compensated by *their* persistence and *my* cessation after apparent death, just as the humble bulb of an annual lives, while the glorious flowers it has put forth die away.

Surely it must be plain that an ingenious man could speculate without end on both sides, and find analogies for all his dreams. Nor does it help me to tell me that the aspirations of mankind—that my own highest aspirations even—lead me towards the doctrine of immortality. I doubt the fact, to begin with, but if it be so even, what is this but in grand words asking me to believe a thing because I like it.

Science has taught to me the opposite lesson. She warns me to be careful how I adopt a view which jumps with my preconceptions, and to require stronger evidence for such belief than for one to which I was previously hostile.

My business is to teach my aspirations to conform themselves to fact, not to try and make facts harmonise with my aspirations.

Science seems to me to teach in the highest and strongest manner the great truth which is embodied in the Christian conception of entire surrender to the will of God. Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly wherever and to whatever abysses nature leads, or you shall learn nothing. I have only begun to learn content and peace of mind since I have resolved at all risks to do this.

There are, however, other arguments commonly brought forward in favour of the immortality of man, which are to my mind not only delusive but mischievous. The one is the notion that the moral government of the world is imperfect without a system of future rewards and punishments. The other is: that

such a system is indispensable to practical morality. I believe that both these dogmas are very mischievous lies.

With respect to the first, I am no optimist, but I have the firmest belief that the Divine Government (if we may use such a phrase to express the sum of the "customs of matter") is wholly just. The more I know intimately of the lives of other men (to say nothing of my own), the more obvious it is to me that the wicked does *not* flourish nor is the righteous punished. But for this to be clear we must bear in mind what almost all forget, that the rewards of life are contingent upon obedience to the *whole* law—physical as well as moral—and that moral obedience will not atone for physical sin, or *vice versa*.

The ledger of the Almighty is strictly kept, and every one of us has the balance of his operations paid over to him at the end of every minute of his existence.

Life cannot exist without a certain conformity to the surrounding universe—that conformity involves a certain amount of happiness in excess of pain. In short, as we live we are paid for living.

And it is to be recollected in view of the apparent discrepancy between men's acts and their rewards that Nature is juster than we. She takes into account what a man brings with him into the world, which human justice cannot do. If I, born, a bloodthirsty and savage brute, inheriting these qualities from others, kill you, my fellow-men will very justly hang me, but I shall not be visited with the horrible remorse which would be my real punishment if, my nature being higher, I had done the same thing.

The absolute justice of the system of things is as clear to me as any scientific fact. The gravitation of sin to sorrow is as certain as that of the earth to the sun, and more so—for experimental proof of the fact is within reach of us all—nay, is before us all in our own lives, if we had but the eyes to see it.

Not only, then, do I disbelieve in the need for compensation, but I believe that the seeking for rewards and punishments out of this life leads men to a ruinous ignorance of the fact that their inevitable rewards and punishments are here.

If the expectation of hell hereafter can keep me from evil-doing, surely *a fortiori* the certainty of hell now will do so? If a man could be firmly impressed with the belief that stealing damaged him as much as swallowing arsenic would do (and it does), would not the dissuasive force of that belief be greater than that of any based on mere future expectations?

And this leads me to my other point.

As I stood behind the coffin of my little son the other day, with my mind bent on anything but disputation, the officiating minister read, as a part of his duty, the words, "If the dead rise not again, let us eat and drink, for to-morrow we die." I cannot tell you how inexpressibly they shocked me. Paul had neither wife nor child, or he must have known that his alternative involved a blasphemy against all that was best and noblest in human nature. I could have laughed with scorn. What! because I am face to face with irreparable loss, because I have given back to the source from whence it came, the cause of a great happiness, still retaining through all my life the blessings which have sprung and will spring from that cause, I am to renounce my manhood, and, howling, grovel in bestiality? Why, the very apes know better, and if you shoot their young, the poor brutes grieve their grief out and do not immediately seek distraction in a gorge.

Kicked into the world a boy without guide or training, or with worse than none, I confess to my shame that few men have drunk deeper of all kinds of sin than I. Happily, my course was arrested in time—before I had earned absolute destruction—and for long years I have been slowly and painfully climbing, with many a fall, towards better things. And when I look back, what do I find to have been the agents of my redemption? The hope of immortality or of future reward? I can honestly say that for these fourteen years such a consideration has not entered my head. No, I can tell you exactly what has been at work. *Sartor Resartus* led me to know that a deep sense of religion was compatible with the entire absence of theology. Secondly, science and her methods gave me a resting-place independent of authority and tradition. Thirdly, love opened up to me a view of the sanctity of human nature, and impressed me with a deep sense of responsibility.

If at this moment I am not a worn-out, debauched, useless carcass of a man, if it has been or will be my fate to advance the cause of science, if I feel that I have a shadow of a claim on the love of those about me, if in the supreme moment when I looked down into my boy's grave my sorrow was full of submission and without bitterness, it is because these agencies have worked upon me, and not because I have ever cared whether my poor personality shall remain distinct for ever from the All from whence it came and whither it goes.

And thus, my dear Kingsley, you will understand what my

position is. I may be quite wrong, and in that case I know I shall have to pay the penalty for being wrong. But I can only say with Luther, "Gott helfe mir, Ich kann nicht anders."

I know right well that 99 out of 100 of my fellows would call me atheist, infidel, and all the other usual hard names. As our laws stand, if the lowest thief steals my coat, my evidence (my opinions being known) would not be received against him.\*

But I cannot help it. One thing people shall not call me with justice and that is—a liar. As you say of yourself, I too feel that I lack courage; but if ever the occasion arises when I am bound to speak, I will not shame my boy.

I have spoken more openly and distinctly to you than I ever have to any human being except my wife.

If you can show me that I err in premises or conclusion, I am ready to give up these as I would any other theories. But at any rate you will do me the justice to believe that I have not reached my conclusions without the care befitting the momentous nature of the problems involved.

And I write this the more readily to you, because it is clear to me that if that great and powerful instrument for good or evil, the Church of England, is to be saved from being shivered into fragments by the advancing tide of science—an event I should be very sorry to witness, but which will infallibly occur if men like Samuel of Oxford are to have the guidance of her destinies—it must be by the efforts of men who, like yourself, see your way to the combination of the practice of the Church with the spirit of science. Understand that all the younger men of science whom I know intimately are *essentially* of my way of thinking. (I know not a scoffer or an irreligious or an immoral man among them, but they all regard orthodoxy as you do Brahmanism.) Understand that this new school of the prophets is the only one that can work miracles, the only one that can constantly appeal to nature for evidence that it is right, and you will comprehend that it is of no use to try to barricade us with shovel hats and aprons, or to talk about our doctrines being "shocking."

I don't profess to understand the logic of yourself, Maurice, and the rest of your school, but I have always said I would swear by your truthfulness and sincerity, and that good must come of your efforts. The more plain this was to me, however, the more obvious the necessity to let you see where the men of

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\* The law with respect to oaths was reformed in 1869.

science are driving, and it has often been in my mind to write to you before.

If I have spoken too plainly anywhere, or too abruptly, pardon me, and do the like to me.

My wife thanks you very much for your volume of sermons.  
—Ever yours very faithfully,

T. H. HUXLEY.

A letter written in reply to the suggestion that he should carry out Hooker's own good resolutions of keeping out of the turmoil of life, and devoting himself to pure science, seems to indicate in its tone something of the stress of the time when it was written—

JERMYN STREET, *Dec. 19, 1860.*

MY DEAR HOOKER—What with one thing and another, I have almost forgotten to answer your note—and first, as to the business matter. . . . Next as to my own private affairs, the youngster is “a swelling wisely,” and my wife is getting on better than I hoped, though not quite so well as I could have wished. The boy's advent is a great blessing to her in all ways. For myself I hardly know yet whether it is pleasure or pain. The ground has gone from under my feet once, and I hardly know how to rest on anything again. Irrational, you will say, but nevertheless natural. And finally as to your resolutions, my holy pilgrim, they will be kept about as long as the resolutions of other anchorites who are thrown into the busy world, or I won't say that, for assuredly you will take the world “as coolly as you can,” and so shall I. But that coolness amounts to the red heat of properly constructed mortals.

It is no use having any false modesty about the matter. You and I, if we last ten years longer, and you by a long while first, will be the representatives of our respective lines in this country. In that capacity we shall have certain duties to perform to ourselves, to the outside world, and to science. We shall have to swallow praise which is no great pleasure, and to stand multitudinous basting and irritations, which will involve a good deal of unquestionable pain. Don't flatter yourself that there is any moral chloroform by which either you or I can render ourselves insensible or acquire the habit of doing things coolly. It is assuredly of no great use to tear one's self to pieces before one is fifty. But the alternative, for men constructed on the high pressure tubular boiler principle, like ourselves, is to lie still

and let the devil have his own way. And I will be torn to pieces before I am forty sooner than see that.

I have been privately trading on my misfortunes in order to get a little peace and quietness for a few months. If I can help it I don't mean to do any dining out this winter, and I have cut down Societies to the minimum of the Geological, from which I cannot get away.

But it won't do to keep this up too long. By and by one must drift into the stream again, and then there is nothing for it but to pull like mad unless we want to be run down by every collier.

I am going to do one sensible thing, however, viz. to rush down to Llanberis with Busk between Christmas Day and New Year's Day and get my lungs full of hill-air for the coming session.

I was at Down on Saturday and saw Darwin. He seems fairly well, and his daughter was up and looks better than I expected to see her.—Ever yours faithfully,

T. H. HUXLEY.

Meanwhile, he took the opportunity to make the child's birth a new link with his old friend, and wrote as follows:—

14 WAVERLEY PLACE, Jan. 3, 1861.

MY DEAR HOOKER—If I had nothing else to write about I must wish you a Happy New Year and many on 'em; but, in fact, my wife and I have a great favour to ask of you, which is neither more nor less than to stand godfather for our little son. You know my opinions on these matters, and I would not ask you to do anything I would not do myself, so if you consent, the clerk shall tell all the lies for you, and you shall be asked to do nothing else than to help devour the christening feed, and be as good a friend to the boy as you have been to his father.

My wife will have the youngster christened, although I am always in a bad temper from the time it is talked about until the ceremony is over. The only way of turning the farce into a reality is by making it an extra bond with one's friends. On the other hand, if you have any objection to say, "all this I steadfastly believe," even by deputy, I know you will have no hesitation in saying so, and in giving me as frank a refusal as my request.\*

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\* As against his dislike of consenting to a rite, to him meaningless, he was moved by a feeling which in part corresponded to Descartes' *morale par provision*,—in part was an acknowledgment of the possi-



Let me know if you have any fault to find with the new *Review*. I think you will see it would have been a dreadful business to translate all the German titles in the bibliography. I returned from a ramble about Snowdon with Busk and Tyndall on the 31st, all the better. My wife is decidedly improved, though she mends but slowly.

Our best wishes to you and all yours.—Ever yours faithfully,  
T. H. HUXLEY.

Any fragments from the rich man's table for the next No. of *N.H.R.*?

14 WAVERLEY PLACE, Jan. 6, 1861.

MY DEAR HOOKER—My wife and I were very pleased to get your hearty and kind acceptance of Godfatherhood. We shall not call upon you for some time, I fancy, as the mistress doesn't get strong very fast. However, I am only glad she is well as she is. She came down yesterday for the first time.

It is very pleasant to get such expressions of opinion as I have had from you, Lyell, and Darwin about the *Review*. They make me quite hopeful about its prosperity, as I am sure we shall be able to do better than our first number.

I am glad you liked what I said in the opening of my article.\* I wish not to be in any way confounded with the cynics who delight in degrading man, or with the common run of materialists, who think mind is any the lower for being a function of matter. I dislike them even more than I do the pietists.

Some of these days I shall look up the ape question again, and go over the rest of the organisation in the same way. But in order to get a thorough grip of the question, I must examine

bilities of individual development, making it only fair to a child to give it a connection with the official spiritual organisation of its country, which it could either ignore or continue on reaching intellectual maturity.

\* In the *Natural History Review* (1861, p. 67).—"The proof of his claim to independent parentage will not change the brutishness of man's lower nature; nor, except in those valet souls who cannot see greatness in their fellow because his father was a cobbler, will the demonstration of a pithecoïd pedigree one whit diminish man's divine right of kingship over nature; nor lower the great and princely dignity of perfect manhood, which is an order of nobility not inherited, but to be won by each of us, so far as he consciously seeks good and avoids evil, and puts the faculties with which he is endowed to their fittest use."

into a good many points for myself. The results, when they do come out, will, I foresee, astonish the natives.

I am cold-proof, and all the better for the Welsh trip. To say truth, I was just on the edge of breaking down when I went. Did I ever send you a letter of mine on the teaching of Natural History? It was published while you were away, and I forget whether I sent it or not. However, a copy accompanies this note. . . .

Of course there will be room for your review and welcome. I have put it down and reckon on it.—Ever yours faithfully,

T. H. HUXLEY.

Huxley returned from the trip to Wales in time to be with his wife for the New Year. The plot she had made with Dr. Tyndall had been entirely successful. The threatened breakdown was averted. Wales in winter was as good as Switzerland. Of the ascent of Snowdon he writes on December 28: "Both Tyndall and I voted it under present circumstances as good as most things Alpine."

His wife, however, continued in very weak health. She was prostrated by the loss of her little boy. So in the middle of March he gladly accepted Mr. Darwin's invitation for her and the three children to spend a fortnight in the quiet of his house at Down, where he himself managed to run down for a week end. "It appears to me," he writes to his wife, "that you are subjecting poor Darwin to a savage Tennysonian persecution. I shall see him looking like a martyr and have to talk double science next Sunday."

In April another good friend, Dr. Bence Jones, lent the invalid his house at Folkestone for three months. Unable even to walk when she went there, her recovery was a slow business. Huxley ran down every week; his brother George and his wife also were frequent visitors. Meanwhile he resolved to move into a new house, in order that she might not return to a place so full of sorrowful memories. On May 30 he effected the move to a larger house not half a mile away from Waverley Place—26 Abbey Place (now 23 Abercorn Place). Here also Mrs. Heathorn lived for the next year, my grandfather, over seventy as he was, being

compelled to go out again to Australia to look after a business venture of his which had come to grief.

Meantime the old house was still on his hands for another year. Trying to find a tenant, he writes on May 21, 1861:—

I met J. Tyndall at Ramsay's last night, and I think he is greatly inclined to have the house. I gave him your message and found that a sneaking kindness for the old house actuated him a good deal in wishing to take it. It is not a bad fellow, and we won't do him much on the fixtures.

Eventually Tyndall and his friend Hirst established themselves there.

This spring Professor Henslow, Mrs. Hooker's father, a botanist of the first rank, and a man extraordinarily beloved by all who came in contact with him, was seized with a mortal illness, and lingered on without hope of recovery through almost the whole of April. Huxley writes:—

JERMYN STREET, *April 4, 1861.*

MY DEAR HOOKER—I am very much grieved and shocked by your letter. The evening before last I heard from Busk that your father-in-law had been ill, and that you had been to see him, and I meant to have written to you yesterday to inquire, but it was driven out of my head by people coming here. And then I had a sort of unreasonable notion that I should see you at the Linnæan Council to-day and hear that all was right again. God knows, I feel for you and your poor wife. Knowing what a great rift the loss of a mere undeveloped child will leave in one's life, I can faintly picture to myself the great and irreparable vacancy in a family circle caused by the vanishing out of it of such a man as Henslow, with great acquirements, and that great calm catholic judgment and sense which always seemed to me more prominent in him than in any man I ever knew.

He had intellect to comprehend his highest duty distinctly, and force of character to do it; which of us dare ask for a higher summary of his life than that? For such a man there can be no fear in facing the great unknown, his life has been one long experience of the substantial justice of the laws by which this world is governed, and he will calmly trust to them still as he lays his head down for his long sleep.

You know all these things as well as I do, and I know as well as you do that such thoughts do not cure heartache or assuage grief. Such maladies, when men are as old as you and I are, are apt to hang about one a long time, but I find that if they are faced and accepted as part of our fair share of life, a great deal of good is to be got out of them. You will find that too, but in the meanwhile don't go and break yourself down with over wear and tear. The heaviest pull comes after the excitement of a catastrophe of this kind is over.

Believe in my affectionate sympathy with you, and that I am, my dear old fellow, yours ever,

T. H. HUXLEY.

And again on the 18th:—

Many thanks for your two letters. It would be sad to hear of life dragging itself out so painfully and slowly, if it were not for what you tell me of the calmness and wisdom with which the poor sufferer uses such strength as is left him.

One can express neither wish nor hope in such a case. With such a man what is will be well. All I have to repeat is, don't knock yourself up. I wish to God I could help you in some way or other beyond repeating the parrot cry. If I can, of course you will let me know.

In June 1861 a jotting in his notebook records that he is at work on the chick's skull, part of the embryological work which he took up vigorously at this time, and at once the continuation of his researches on the Vertebrate Skull, embodied in his Croonian lecture of 1858, and the beginning of a long series of investigations into the structure of birds. There is a reference to this in a very interesting letter dealing chiefly with what he conceived to be the cardinal point of the Darwinian theory:—

26 ABBEY PLACE, *Sept.* 4, 1861.

MY DEAR HOOKER—Yesterday being the first day I went to the Athenæum after reading your note, I had a look at, and a good laugh over, the *Quarterly* article. Who can be the writer?

I have been so busy studying chicken development, a difficult subject to which I had long ago made up my mind to devote my first spare time, that I have written you no word about your article in the *Gardener's Chronicle*. I quite agree with the general tendency of your argument, though it seems to me that

you put your view rather too strongly when you seem to question the position "that, as a rule, resemblances prevail over differences" between parent and offspring. Surely, as a rule, resemblances *do* prevail over differences, though I quite agree with you that the latter have been far too much overlooked. The great desideratum for the species question at present seems to me to be the determination of the law of variation. Because no law has yet been made out, Darwin is obliged to speak of variation as if it were spontaneous or a matter of chance, so that the bishops and superior clergy generally (the only real atheists and believers in chance left in the world) gird at him as if he were another Lucretius.

It is [in] the recognition of a tendency to variation apart from the variation of what are ordinarily understood as external conditions that Darwin's view is such an advance on Lamarck. Why does not somebody go to work experimentally, and get at the law of variation for some one species of plant?

What a capital article that was in the *Athenæum* the other day *apud* the Schlagintweits.\* Don Roderigo is very wroth at

\* The brothers Schlagintweit (four of whom were ultimately employed), who had gained some reputation for their work on the Physical Geography of the Alps, were, on Humboldt's recommendation, despatched by the East India Company in 1854-55-56 to the Deccan, and especially to the Himalayan region (where they were the first Europeans to cross the Kuenlun Mountains), in order to correlate the instruments and observations of the several magnetic surveys of India. But they enlarged the scope of their mission by professing to correct the great trigonometrical survey, while the contract with them was so loosely drawn up that they had practically a roving commission in science, to make researches and publish the results—up to nine volumes—in all manner of subjects, which in fact ranged from the surveying work to ethnology, and were crowned by an additional volume on Buddhism! The original cost to the Indian Government was estimated at £15,000; the allowances from the English Government during the inordinately prolonged period of arranging and publishing materials, including payment for sixty copies of each volume, atlas, and so forth, as well as personal payments, came to as much more.

Unfortunately the results were of less value than was expected. The attempt to correct the work done with the large instruments of the trigonometrical survey by means of far smaller instruments was absurd; away from the ground covered by the great survey the figures proved to be very inaccurate. The most annoying part of the

being made responsible with Sabine, and indeed I think he had little enough to do with it.

You will see a letter from him in this week's *Athenæum*.—  
Ever yours faithfully, T. H. HUXLEY.

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affair was that it absorbed the State aid which might have been given to more valuable researches.

The Council of the Royal Society had been consulted as to the advisability of despatching this expedition and opposed it, for there were in the service of the Company not a few men admirably qualified for the duty, whose scientific services had received scant appreciation. Nevertheless, the expedition started after all, with the approval of Colonel Sabine, the president. In the last months of 1866, Huxley drew up for the Royal Society a report upon the scientific value of the results of the expedition.

## CHAPTER XVII

1861-1863

It has been seen that the addition of journalistic work in science to the mass of original research and teaching work upon which Huxley was engaged, called forth a remonstrance from both Lyell and Darwin. To Hooker it seemed still more serious that he was dividing his allegiance, and going far afield in philosophy, instead of concentrating himself upon natural science. He writes:—

I am sorry to hear that you are so poorly, and wish I could help you to sit down and work quietly at pure science. You have got into a whirlpool, and should strike out vigorously at the proper angle, not attempt to breast the whole force of the current, nor yet give in to it. Do take the counsel of a quiet looker on and withdraw to your books and studies in pure Natural History; let modes of thought alone. You may make a very good naturalist, or a very good metaphysician (of that I know nothing, don't despise me), but you have neither time nor place for both.

However, it must be remarked that this love of philosophy, not recently acquired either, was only part of the passion for general principles underlying the facts of science which had always possessed him. And the time expended upon it was not directly taken from the hours of scientific work; he would read in bed through the small hours of the night, when sleep was slow in coming to him. In this way he got through an immense amount of philosophy in the course of several years. Not that he could "state the views of so and so" upon any given question, or desired such kind of knowledge; he wished to find out and compare with his

own the answers which other thinkers gave to the problems which interested himself.

A gentler reproof of this time touches his handwriting, which was never of the most legible, so that his foreign correspondents in particular sometimes complained. Haeckel used to get his difficulties deciphered by his colleague Gegenbaur. I cannot forbear quoting the delicate remonstrance of Professor Lacaze du Thiers, and the flattering remedy he proposed:—

*March 14.*—Je lis l'Anglais imprimé, mais vos écritures anglaises sont si rapides, qu'il m'est quelquefois difficile de m'en sortir. On me dit que vous écrivez si bien le français que je crois que je vous lirais bien mieux dans ma langue!

On his return from examining at Dublin, he again looked over proofs for Mr. Spencer.

JERMYN STREET, *Aug. 3, 1861.*

MY DEAR SPENCER—I have been absent on a journey to Dublin and elsewhere\* nearly all this week, and hence your note and proof did not reach me till yesterday. I have but just had time to glance through the latter, and I need hardly say how heartily I concur in its general tenor. I have, however, marked one or two passages which I think require some qualification. Then, at p. 272, the fact that the vital manifestations of plants depend as entirely as those of animals upon the fall towards stable equilibrium of the elements of a complex protein compound is not sufficiently prominent. It is not so much that plants are deoxidisers and animals oxidisers, as that plants are manufacturers and animals consumers. It is true that plants manufacture a good deal of non-nitrogenous produce in proportion to the nitrogenous, but it is the latter which is chiefly useful to the animal consumer and not the former. This point is a very important one, which I have never seen clearly and distinctly put—the prettiness of Dumas' circulation of the elements having seduced everybody.

Of course this in no way affects the principle of what you say. The statements which I have marked at p. 276 and 278 should have their authorities given, I think. I should hardly like to commit myself to them absolutely.

You will, if my memory does not mislead me, find authority for my note at p. 283 in Stephenson's life. I think old Geo.

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\* Visiting Sir Philip Egerton at Oulton Park.



Stephenson brought out his views at breakfast at Sir R. Peel's when Buckland was there.

These are all the points that strike me, and I do not keep your proof any longer (I send it by the same post as this note), because I fear you may be inconvenienced by the delay.

Tyndall is unfortunately gone to Switzerland, so that I cannot get you his comments. Whether he might have picked holes in any detail or not I do not know, but I know his opinions sufficiently well to make sure in his agreement with the general argument. In fact a favourite problem of his is—Given the molecular forces in a mutton chop, deduce Hamlet or Faust therefrom. He is confident that the Physics of the Future will solve this easily.

I am grieved to hear such a poor account of your health; I believe you will have to come at last to the heroic remedy of matrimony, and if "gynopathy" were a mode of treatment that could be left off if it did not suit the constitution, I should decidedly recommend it.

But it's worse than opium-eating—once begin and you must go on, and so, though I ascribe my own good condition mainly to the care my wife takes of me, I dare not recommend it to you, lest perchance you should get hold of the wrong medicine.

Beyond spending a night awake now and then I am in very good order, and I am going to spend my vacation in a spasmodic effort to lick the *Manual* into shape and work off some other arrears.

My wife is very fairly well, and, I trust, finally freed from all the symptoms which alarmed me so much. I dread the coming round of September for her again, but it must be faced.

The babbies are flourishing; and beyond the facts that we have a lunatic neighbour on one side and an empty house on the other, that it has cost me about twice as much to get into my house as I expected, that the cistern began to leak and spoil a ceiling, and such other small drawbacks, the new house is a decided success.

I forget whether I gave you the address, which is—

26 ABBEY PLACE,

ST. JOHN'S WOOD.

You had better direct to me there, as after the 10th of this month I shall not be here for six weeks.—Ever yours faithfully,

T. H. HUXLEY.

October shows an unusual entry in his diary; the sacrifice of a working evening to hear Jenny Lind sing. Fond though he was of music, as those may remember who ever watched his face at the Sunday evening gatherings in Marlborough Place in the later seventies, when there was sure to be at least a little good music or singing either from his daughters or some of the guests, he seldom could spare the time for concert-going or theatre-going, and the occasional notes of his bachelor days, "to the opera with Spencer," had ceased as his necessary occupations grew more engrossing.

This year his friend Hooker moved to Kew to act as second in command to his father, Sir William Hooker, the director of the Botanical Gardens. This move made meetings between the two friends, except at clubs and societies, more difficult, and was one of the immediate causes of the foundation of the *x* Club. It is this move which is referred to in the following letters; the "poor client" being the wife of an old messmate of his on the *Rattlesnake*:—

JERMYN STREET, *Nov. 17.*

MY DEAR HOOKER—My wife wrote to yours yesterday, the enclosed note explaining the kitchen-revolution which, it seems, must delay our meeting. When she had done, however, she did not know where to direct it, and I am no wiser, so I send it to you.

It's a horrid nuisance and I have sworn a few, but that will not cook the dinner, however much it may prepare me for being cooked elsewhere. To complete my disgust at things in general, my wife is regularly knocked up with dining out twice this week, though it was only in the quietest way. I shall have to lock her up altogether.

X— has made a horrid mess of it, and I am sorry to say, from what I know of him, that I cannot doubt where the fault lies. The worst of it is that he has a wife and three children over here, left without a penny or any means of support. The poor woman wrote to me the other day, and when I went to see her I found her at the last shilling and contemplating the workhouse as her next step. She has brothers in Australia, and it appeared to me that the only way to do her any good was to get her out. She cannot starve there, and there will be more hope

for her children than an English poor-house. I am going to see if the Emigration Commissioners will do anything for her, as of course it is desirable to cut down the cost of exportation to the smallest amount.

It is most lamentable that a man of so much ability should have so utterly damned himself as X—— has, but he is hopelessly Celtic.

I shall be at the Phil. Club next Thursday.—Ever yours faithfully,  
T. H. HUXLEY.

14 WAVERLEY PLACE, Monday morning [Nov. 1861].

MY DEAR HOOKER — The obstinate manner in which Mrs. Hooker and you go on refusing to give any address leads us to believe that you are dwelling peripatetically in a "Wan" with green door and brass knocker somewhere on Wormwood Scrubbs, and that "Kew" is only a blind. So you see I am obliged to inclose Mrs. Hooker's epistle to you.

You shall have your own way about the dinner, though we shall have triumphed over all domestic difficulties by that time, and the first lieutenant scorns the idea of being "worried" about anything. I only grieve it is such a mortal long way for you to come.

I could find it in my heart to scold you well for your generous aid to my poor client. I assure you I told you all about the case because it was fresh in my mind, and without the least notion of going to you for that kind of aid. May it come back to you in some good shape or other.

I find it is no use to look for help from the emigration people, but I have no fear of being able to get the £50 which will send them out by the *Walter Hood*.

Would it be fair to apply to Bell in such a case? I will have a talk to you about it at the Phil. Club.—Ever, my dear Hooker, yours faithfully,  
T. H. HUXLEY.

In 1862, in addition to all the work connected with the species question already detailed, Huxley published three paleontological papers,\* while the paper on the "Anatomy and Development of Pyrosoma," first read on December 1,

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\* "On the new Labyrinthodonts from the coal-field of Edinburgh"; "On a Stalk-eyed Crustacean from the coal-fields of Paisley"; and "On the Teeth of Diprotodon."

1859, was now published in the *Proceedings of the Linnæan Society*.

In the list of work in hand are four paleontological papers,\* besides the slowly progressing *Manual of Comparative Anatomy*.

When he went north to deliver his lectures at Edinburgh "On the relation of Man to the Lower Animals," he took the opportunity of examining fossils at Forfar, and lectured also at Glasgow; while at Easter he went to Ireland; on March 15 he was at Dublin, lecturing there on the 25th.

Reference has already been made (in the letter to C. Darwin of May 6, 1862) to the unsatisfactory state of Huxley's health. He was further crippled by neuralgic rheumatism in his arm and shoulder, and to get rid of this, went on July 1 to Switzerland for a month's holiday. Reaching Grindelwald on the 4th, he was joined on the 6th by Dr. Tyndall, and with him rambled on the glacier and made an expedition to the Faulhorn. On the 13th they went to the Rhone glacier, meeting Sir J. Lubbock on their way, at the other side of the Grimsel. Both here and at the Eggischhorn, where they went a few days later, Huxley confined himself to easy expeditions, or, as his notebook has it, stayed "quiet" or "idle," while the hale pair ascended the Galenstock and the Jungfrau.

By July 28 he was home again in time for an examiners' meeting at the London University the next day, and a *viva voce* in physiology on the 4th August, before going to Scotland to serve on the Fishery Commission.

This was the first of the numerous commissions on which he served. With his colleagues, Dr. Lyon Playfair (afterwards Lord Playfair) and Colonel Maxwell, he was busy from August 8 to September 16, chiefly on the west coast, taking evidence from the trawlers and their oppo-

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\* "On Indian Fossils," on "Cephalaspis and Pteraspis," on "Stagonolepis," and a "Memoir descriptive of Labyrinthodont remains from the Trias and Coal of Britain," which he first treated of in 1858, "clearly establishing for the first time the vertebrate nature of these remains."—Sir M. Foster, Obit. Notice, *Proc. R. S.* lix. 55.

nents, and making direct investigations into the habits of the herring.

The following letter to Mr. (afterwards Sir W. H.) Flower, then Curator of the Royal College of Surgeons' Museum, refers to this trip and to his appointment to the examinership in physiology at the College of Surgeons, for which he had applied in May and which he held until 1870. Mr. Flower, indeed, was deeply interested at this time in the same problems as Huxley, and helped his investigations for *Man's Place* by making a number of dissections to test the disputed relations between the brain of man and of the apes.

HOTEL DE LA JUNGFRAU, AEGGISCHHORN, *July 18, 1862.*

MY DEAR FLOWER—Many thanks for your letter. I shall make my acknowledgments to the council in due form when I have read the official announcement on my return to England. I trust they will not have occasion to repent declining Dr. ——'s offer. At any rate I shall do my best.

I am particularly obliged to you for telling me about the Dijon bones. Dijon lies quite in my way in returning to England, and I shall stop a day there for the purpose of making the acquaintance of M. Nodet and his *Schizopleuron*. I have a sort of dim recollection that there are some other remains of extinct South American mammals in the Dijon Museum which I ought to see.

Your news about the lower jaw made me burst out into such an exclamation that all the *salle-à-manger* heard me! I saw the fitness of the thing at once. The foramen and the shape of the condyle ought to have suggested it at once.

I have had a very pleasant trip, passing through Grindelwald, the Aar valley, and the Rhone valley, as far as here; but, up to the day before yesterday, my health remained very unsatisfactory, and I was terribly teased by the neuralgia or rheumatism or whatever it is.

On that day, however, I had a very sharp climb involving a great deal of exertion and a most prodigious sweating, and on the next morning I really woke up a new man. Yesterday I repeated the dose and I am in hopes now that I shall come back fit to grapple with all the work that lies before me.—Ever, my dear Flower, yours very faithfully,

T. H. HUXLEY.

This autumn he gladly took on what appeared to be an additional piece of work. On October 12 he writes from 26 Abbey Place:—

I saw Flower yesterday, and I find that my present colleague in the Hunterian Professorship wishes to get rid of his share in the lectures, having, I suppose, at the eleventh hour discovered his incompetency. It looks paradoxical to say so, but it will really be easier for me to give eighteen or twenty-four lectures than twelve, so that I have professed my readiness to take as much as he likes off his hands.

This professorship had been in existence for more than sixty years, for when the Museum of the famous anatomist John Hunter was entrusted to the College of Surgeons by the Government, the condition was made that "one course of lectures, not less than twenty-four in number, on comparative anatomy and other subjects, illustrated by the preparations, shall be given every year by some member of the company." Huxley arranged to publish from year to year the substance of his lectures on the vertebrates, "and by that process to bring out eventually a comprehensive, though condensed, systematic work on *Comparative Anatomy*." \*

Of the labour entailed in this course, the late Sir W. H. Flower wrote:—

When, in 1862, he was appointed to the Hunterian Professorship at the College of Surgeons, he took for the subject of several yearly courses of lectures the anatomy of the vertebrata, beginning with the primates, and as the subject was then rather new to him, and as it was a rule with him never to make a statement in a lecture which was not founded upon his own actual observation, he set to work to make a series of original dissections of all the forms he treated of. These were carried on in the workroom at the top of the college, and mostly in the evenings, after his daily occupation at Jermyn Street (the School of Mines, as it was then called) was over, an arrangement which my residence in the college buildings enabled me to make for him. These rooms contained a large store of material, entire or partially dissected animals preserved in spirit,

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\* *Comparative Anatomy*, vol. i. Preface.

which, unlike those mounted in the museum, were available for further investigation in any direction, and these, supplemented occasionally by fresh subjects from the Zoological Gardens, formed the foundation of the lectures. . . . On these evenings it was always my privilege to be with him, and to assist in the work in which he was engaged. In dissecting, as in everything else, he was a very rapid worker, going straight to the point he wished to ascertain with a firm and steady hand, never diverted into side issues, nor wasting any time in unnecessary polishing up for the sake of appearances; the very opposite, in fact, to what is commonly known as "finikin." His great facility for bold and dashing sketching came in most usefully in this work, the notes he made being largely helped out with illustrations.

The following is the letter in which he makes himself known to Professor Haeckel of Jena, who, in his thanks for the specimens, bewails the lot of "us poor inland Germans, who have to get help from England."

THE ROYAL SCHOOL OF MINES,  
JERMYN STREET, LONDON, *October 28, 1862.*

SIR—A copy of your exceedingly valuable and beautiful monograph, "Die Radiolarien," came into my hands two or three days ago, and I have been devoting the little leisure I possess just at present to a careful study of its contents, which are to me profoundly interesting and instructive.

Permit me to say this much by way of introduction to a request which I have to prefer, which is, that you will be good enough to let me have a copy of your Habitationsschrift, *De Rhizopodum Finibus*, if you have one to spare. If it is sent through Frommans of Jena to the care of Messrs. Williams and Norgate, London, it will reach me safely.

I observe that in your preface you state that you have no specimen of the famous Barbadoes deposit. As I happen to possess some from Schomburgk's own collection, I should be ashamed to allow you any longer to suffer from that want, and I beg your acceptance of the inclosed little packet. If this is not sufficient, pray let me know and I will send you as much more.

If you desire it, I can also send you some of the Oran earth, and as much as you like of the Atlantic deep-sea soundings, which are almost entirely made up of *Globigerina* and *Polycistina*.—I am, Sir, yours very faithfully,

THOMAS H. HUXLEY.

The next letter refers to the scientific examinations at the University of London.

Dec. 4, 1862.

MY DEAR HOOKER—I look upon you as art and part of the *Natural History Review*, though not ostensibly one of the gang, so I bid you to a feast, partly of reason and partly of mutton, at my house on December 11 (being this day week) at half-past six. Do come if you can, for we have not seen your ugly old phiz for ages, and should be comforted by an inspection thereof, however brief.

I did my best yesterday to get separate exhibitions for Chemistry, Botany, and Zoological Biology, at the committee yesterday,\* and I suspect from your letter that if you had been there you would have backed me. However, it is clear they only mean to give separate exhibits for Chemistry and Biology as a whole.

Because Botany and Zoology are, philosophically speaking, cognate subjects, people are under the delusion that it is easier to work both up at the same time, than it would be to work up, say, Chemistry and Botany. Just fancy asking a young man who has heaps of other things to work up for the B.Sc., to qualify himself for honours both in botany, histological, systematic, and physiological. That is to say, to get a *practical knowledge* of both these groups of subjects.

I really think the botanical and zoological examiners ought to memorialise the senate jointly on the subject. The present system leads to mere shani and cram.—Ever yours,

T. H. HUXLEY.

The year 1863, notable for the publication of Huxley's first book, found him plunged deep in an immense quantity of work of all sorts. He was still examiner in Physiology and Comparative Anatomy at the London University, a post he held from 1855 to 1863, and again from 1865 to 1870, "making," as Sir Michael Foster says, "even an examination feel the influence of the new spirit in biology; and among his examinees at that time there was one at least who, knowing Huxley by his writings, but by his writings only, looked forward to the *viva voce* test, not as a trial, but as an occasion of delight."

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\* At the London University.



In addition to the work mentioned in the following letters, I note three lectures at Hull on April 6, 8, and 10; a paper on "Craniology" (January 17), and his "Letter on the Human Remains in the Shell Mounds," in the *Ethnological Society's Transactions*, while the Fishery Commission claimed much of his time, either at the Board of Trade, or travelling over the north, east, and south coasts from the end of July to the beginning of October, and again in November and December.

JERMYN STREET, *April 30, 1863.*

MY DEAR KINGSLEY—I am exceedingly pleased to have your good word about the lectures,\*—and I think I shall thereby be encouraged to do what a great many people have wished—that is, to bring out an enlarged and revised edition of them.

The only difficulty is time—if one could but work five-and-twenty hours a day!

With respect to the sterility question, I do not think there is much doubt as to the effect of breeding in and in in destroying fertility. But the sterility which must be obtained by the selective breeder in order to convert his morphological species into physiological species—such as we have in nature—must be quite irrespective of breeding in and in.

There is no question of breeding in and in between a horse and an ass, and yet their produce is usually a sterile hybrid.

So if Carrier and Tumbler, *e.g.*, were physiological species equivalent to Horse and Ass, their progeny ought to be sterile or semi-sterile. So far as experience has gone, on the contrary, it is perfectly fertile—as fertile as the progeny of Carrier and Carrier or Tumbler and Tumbler.

From the first time that I wrote about Darwin's book in the *Times* and in the *Westminster* until now, it has been obvious to me that this is the weak point of Darwin's doctrine. He has shown that selective breeding is a *vera causa* for morphological species; he has not yet shown it a *vera causa* for physiological species.

But I entertain little doubt that a carefully devised system of experimentation would produce physiological species by selection—only the feat has not been performed yet.

I hope you received a copy of *Man's Place in Nature*, which I desired should be sent to you long ago. Don't suppose I ever

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\* See p. 223.

expect an acknowledgment of a book—it is one of the greatest nuisances in the world to have that to do, and I never do it—but as you mentioned the Lectures and not the other, I thought it might not have reached you. If it has not, pray let me know and a copy shall be forwarded, as I want you very much to read Essay No. 2.

I have a great respect for all the old bottles, and if the new wine can be got to go into them and not burst them I shall be very glad—I confess I do not see my way to it; on the contrary, the longer I live and the more I learn the more hopeless to my mind becomes the contradiction between the theory of the universe as understood and expounded by Jewish and Christian theologians, and the theory of the universe which is every day and every year growing out of the application of scientific methods to its phenomena.

Whether astronomy and geology can or cannot be made to agree with the statements as to the matters of fact laid down in Genesis—whether the Gospels are historically true or not—are matters of comparatively small moment in the face of the impassable gulf between the anthropomorphism (however refined) of theology and the passionless impersonality of the unknown and unknowable which science shows everywhere underlying the thin veil of phenomena.

Here seems to me to be the great gulf fixed between science and theology—beside which all Colenso controversies, reconciliations of Scripture *à la* Pye Smith, etc., cut a very small figure.

You must have thought over all this long ago; but steeped as I am in scientific thought from morning till night, the contrast has perhaps a greater vividness to me. I go into society, and except among two or three of my scientific colleagues I find myself alone on these subjects, and as hopelessly at variance with the majority of my fellow-men as they would be with their neighbours if they were set down among the Ashantees. I don't like this state of things for myself—least of all do I see how it will work out for my children. But as my mind is constituted, there is no way out of it, and I can only envy you if you can see things differently.—Ever yours very faithfully,

T. H. HUXLEY.

JERMYN STREET, *May 5, 1863.*

MY DEAR KINGSLEY—My wife and children are away at Felixstow on the Suffolk coast, and as I run down on Saturday and come back on Monday your MS. has been kept longer than

it should have been. I am quite agreed with the general tenor of your argument; and indeed I have often argued against those who maintain the intellectual gulf between man and the lower animals to be an impassable one, by pointing to the immense intellectual chasm as compared to the structural differences between two species of bees or between sheep and goat or dog and wolf. So again your remarks upon the argument drawn from the apparent absence of progression in animals seem to me to be quite just. You might strengthen them much by reference to the absence of progression in many races of men. The West African savage, as the old voyagers show, was in just the same condition two hundred years ago as now—and I suspect that the modern Patagonian is as nearly as possible the unimproved representative of the makers of the flint implements of Abbeville.

Lyell's phrase is very good, but it is a simple application of Darwin's views to human history. The advance of mankind has everywhere depended on the production of men of genius; and that production is a case of "spontaneous variation" becoming hereditary, not by physical propagation, but by the help of language, letters and the printing press. Newton was to all intents and purposes a "sport" of a dull agricultural stock, and his intellectual powers are to a certain extent propagated by the grafting of the "Principia," his brain-shoot, on us.

Many thanks for your letter. It is a great pleasure to me to be able to speak out to any one who, like yourself, is striving to get at truth through a region of intellectual and moral influences so entirely distinct from those to which I am exposed.

I am not much given to open my heart to anybody, and on looking back I am often astonished at the way in which I threw myself and my troubles at your head, in those bitter days when my poor boy died. But the way in which you received my heathen letters set up a freemasonry between us, at any rate on my side; and if they make you a bishop I advise you not to let your private secretary open any letters with my name in the corner, for they are as likely as not to contain matters which will make the clerical hair stand on end.

I am too much a believer in Butler and in the great principle of the "Analogy" that "there is no absurdity in theology so great that you cannot parallel it by a greater absurdity of Nature" (it is not commonly stated in this way), to have any difficulties about miracles. I have never had the least sympathy with the *a priori* reasons against orthodoxy, and I have by

nature and disposition the greatest possible antipathy to all the atheistic and infidel school.

Nevertheless, I know that I am, in spite of myself, exactly what the Christian world call, and, so far as I can see, are justified in calling, atheist and infidel. I cannot see one shadow or tittle of evidence that the great unknown underlying the phenomena of the universe stands to us in the relation of a Father—loves us and cares for us as Christianity asserts. On the contrary, the whole teaching of experience seems to me to show that while the governance (if I may use the term) of the universe is rigorously just and substantially kind and beneficent, there is no more relation of affection between governor and governed than between me and the twelve judges. I know the administrators of the law desire to do their best for everybody, and that they would rather not hurt me than otherwise, but I also know that under certain circumstances they will most assuredly hang me; and that in any case it would be absurd to suppose them guided by any particular affection for me.

This seems to me to be the relation which exists between the cause of the phenomena of this universe and myself. I submit to it with implicit obedience and perfect cheerfulness, and the more because my small intelligence does not see how any other arrangement could possibly be got to work as the world is constituted.

But this is what the Christian world calls atheism, and because all my toil and pains does not enable me to see my way to any other conclusion than this, a Christian judge would (if he knew it) refuse to take my evidence in a court of justice against that of a Christian ticket-of-leave man.

So with regard to the other great Christian dogmas, the immortality of the soul, and the future state of rewards and punishments, what possible objection *a priori* can I—who am compelled perforce to believe in the immortality of what we call Matter and Force and in a very unmistakable *present* state of rewards and punishments for all our deeds—have to these doctrines? Give me a scintilla of evidence, and I am ready to jump at them.

But read Butler, and see to what drivell even his great mind descends when he has to talk about the immortality of the soul! I have never seen an argument on that subject which from a scientific point of view is worth the paper it is written upon. All resolve themselves into this formula:—The doctrine of the

immortality of the soul is very pleasant and very useful, therefore it is true.

All the grand language about "human aspiration," "consistency with the divine justice," etc. etc., collapses into this at last—Better the misery of the "Vale! in æternum vale!" ten times over than the opium of such empty sophisms—I have drunk of that cup to the bottom.

I am called away and must close my letter. Don't trouble to answer it unless you are so minded.—Ever yours faithfully,  
T. H. HUXLEY.

JERMYN STREET, *May 22*, 1863.

MY DEAR KINGSLEY—Pray excuse my delay in replying to your letter. I have been very much pressed for time for these two or three days.

First touching the action of the spermatozoon. The best information you can find on the subject is, I think, in Newport's papers in the *Philosophical Transactions* for 1851, 1853, and 1854, especially the 1853 paper. Newport treats only of the Frog, but the information he gives is very full and definite. Allen Thomson's very accurate and learned article "Ovum" in Todd's *Cyclopædia* is also well worth looking through, though unfortunately it is least full just where you want most information. In French there is Coste's *Développement des Corps organisés* and the volume on "Development" by Bischoff in the French translation of the last edition of Soemmering's *Anatomy*.

So much for your inquiries as to the matters of fact. Next, as to questions of speculation. If any expression of ignorance on my part will bring us nearer we are likely to come into absolute contact, for the possibilities of "*may be*" are, to me, infinite.

I know nothing of Necessity, abominate the word Law (except as meaning that we know nothing to the contrary), and am quite ready to admit that there may be some place, "other side of nowhere," *par exemple*, where  $2 + 2 = 5$ , and all bodies naturally repel one another instead of gravitating together.

I don't know whether Matter is anything distinct from Force. I don't know that atoms are anything but pure myths. *Cogito, ergo sum* is to my mind a ridiculous piece of bad logic, all I can say at any time being "*Cogito*." The Latin form I hold to be preferable to the English "I think," because the latter asserts the existence of an Ego—about which the bundle of

phenomena at present addressing you knows nothing. In fact, if I am pushed, metaphysical speculation lands me exactly where your friend Raphael was when his bitch pupped. In other words, I believe in Hamilton, Mansell and Herbert Spencer so long as they are destructive, and I laugh at their beards as soon as they try to spin their own cobwebs.

Is this basis of ignorance broad enough for you? If you, theologian, can find as firm footing as I, man of science, do on this foundation of minus nought—there will be nought to fear for our ever diverging.

For you see I am quite as ready to admit your doctrine that souls secrete bodies as I am the opposite one that bodies secrete souls—simply because I deny the possibility of obtaining any evidence as to the truth and falsehood of either hypothesis. My fundamental axiom of speculative philosophy is that *materialism and spiritualism are opposite poles of the same absurdity*—the absurdity of imagining that we know anything about either spirit or matter.

Cabanis and Berkeley (I speak of them simply as types of schools) are both asses, the only difference being that one is a black donkey and the other a white one.

This universe is, I conceive, like to a great game being played out, and we poor mortals are allowed to take a hand. By great good fortune the wiser among us have made out some few of the rules of the game, as at present played. We call them "Laws of Nature," and honour them because we find that if we obey them we win something for our pains. The cards are our theories and hypotheses, the tricks our experimental verifications. But what sane man would endeavour to solve this problem: given the rules of a game and the winnings, to find whether the cards are made of pasteboard or gold-leaf? Yet the problem of the metaphysicians is to my mind no saner.

If you tell me that an Ape differs from a Man because the latter has a soul and the ape has not, I can only say it may be so; but I should uncommonly like to know how either that the ape has not one or that the man has.

And until you satisfy me as to the soundness of your method of investigation, I must adhere to what seems to my mind a simpler form of notation—*i.e.* to suppose that all phenomena have the same substratum (if they have any), and that soul and body, or mental and physical phenomena, are merely diverse manifestations of that hypothetical substratum. In this way,

it seems to me, I obey the rule which works so well in practice, of always making the simplest possible suppositions.

On the other hand, if you are of a different opinion, and find it more convenient to call the  $x$  which underlies (hypothetically) mental phenomena, Soul, and the  $x$  which underlies (hypothetically) physical phenomena, Body, well and good. The two-fluid theory and the one-fluid theory of electricity both accounted for the phenomena up to a certain extent, and both were probably wrong. So it may be with the theories that there is only one  $x$  in nature or two  $x$ 's or three  $x$ 's.

For, if you will think upon it, there are only four possible ontological hypotheses now that Polytheism is dead.

- |  |  |
|--|--|
| I. There is no $x$                               | = Atheism on Berkeleyan principles.                                  |
| II. There is only one $x$                        | = Materialism or Pantheism, according as you turn it heads or tails. |
| III. There are two $x$ 's<br>Spirit and Matter   | } = Speculators <i>incertæ sedis</i> .                               |
| IV. There are three $x$ 's<br>God, Souls, Matter |  |
|  | } = Orthodox Theologians.  |

To say that I adopt any one of those hypotheses, as a representation of fact, would to my mind be absurd; but No. 2 is the one I can work with best. To return to my metaphor, it chimes in better with the rules of the game of nature than any other of the four possibilities, to my mind.

But who knows when the great Banker may sweep away table and cards and all, and set us learning a new game? What will become of all my poor counters then? It may turn out that I am quite wrong, and that there are no  $x$ 's or 20  $x$ 's.

I am glad you appreciate the rich absurdities of the new doctrine of spontaneous generation [?]. Against the doctrine of spontaneous generation in the abstract I have nothing to say. Indeed it is a necessary corollary from Darwin's views if legitimately carried out, and I think Owen smites him (Darwin) fairly for taking refuge in "Pentateuchal" phraseology when he ought to have done one of two things—(a) give up the problem, (b) admit the necessity of spontaneous generation. It is the very passage in Darwin's book to which, as he knows right well, I have always strongly objected. The  $x$  of science and the  $x$  of genesis are two different  $x$ 's, and for any sake don't let us confuse them together. Maurice has sent me his book. I have

read it, but I find myself utterly at a loss to comprehend his point of view.—Ever yours faithfully,  
T. H. HUXLEY.

The following letter is interesting, as showing his continued interest in the question of skull structure, as well as his relation to his friend and fellow-worker, Dr. W. K. Parker.

JERMYN STREET, *March 18, 1863.*

MY DEAR PARKER—Any conclusion that I have reached will seem to me all the better based for knowing that you have been near or at it, and I am therefore right glad to have your letter. If I had only time, nothing would delight me more than to go over your preparations, but these Hunterian Lectures are about the hardest bit of work I ever took in hand, and I am obliged to give every minute to them.

By and by I will gladly go with you over your vast material.

Did you not some time ago tell me that you considered the Y-shaped bone (so-called presphenoid) in the Pike to be the true basisphenoid? If so, let me know before lecture to-morrow, that I may not commit theft unawares.

I have arrived at that conclusion myself from the anatomical relations of the bone in question to the brain and nerves.

I look upon the proposition opisthotis = turtle's "occipital externe" = Perch's Rocher (Cuvier) as the one thing needful to clear up the unity of structure of the bony cranium; and it shall be counted unto me as a great sin if I have helped to keep you back from it. The thing has been dawning upon me ever since I read Kölliker's book two summers ago, but I have never had time to work it out.—Ever yours faithfully,

T. H. HUXLEY.

The following extracts from a letter to Hooker and a letter to Darwin describe the pressure of his work at this time.

1863.

MY DEAR HOOKER— . . . I would willingly send a paper to the Linnæan this year if I could, but I do not see how it is practicable. I lecture five times a week from now till the middle of February. I then have to give eighteen lectures at the Coll. Surgeons—six on classification, and twelve on the vertebrate skeleton. I must write a paper on this new Glyptodon, with some eighteen to twenty plates. A preliminary notice has already gone to the Royal Society. I have a decade of fossil



fish in progress; a fellow in the country *will* keep on sending me splendid new Labyrinthodonts from the coal, and that d—d manual must come out.—*Ayez pitié de moi.* T. H. H.

JERMYN STREET, July 2, 1863.

MY DEAR DARWIN—I am horribly loth to say that I cannot do anything you want done; and partly for that reason and partly because we have been very busy here with some new arrangements during the last day or two, I did not at once reply to your note.

I am afraid, however, I cannot undertake any sort of new work. In spite of working like a horse (or if you prefer it, like an ass), I find myself scandalously in arrear, and I shall get into terrible hot water if I do not clear off some things that have been hanging about me for months and years.

If you will send me up the specimens, however, I will ask Flower (whom I see constantly) to examine them for you. The examination will be no great trouble, and I am ashamed to make a fuss about it, but I have sworn a big oath to take no fresh work, great or small, until certain things are done.

I wake up in the morning with somebody saying in my ear, "A is not done, and B is not done, and C is not done, and D is not done," etc., and a feeling like a fellow whose duns are all in the street waiting for him. By the way, you ask me what I am doing now, so I will just enumerate some of the A, B, and C's aforesaid.

A. Editing lectures on Vertebrate skull and bringing them out in the *Medical Times*.

B. Editing and re-writing lectures on Elementary Physiology,\* just delivered here and reported as I went along.

C. Thinking of my course of twenty-four lectures on the Mammalia at Coll. Surgeons in next spring, and making investigations bearing on the same.

D. Thinking of and working at a *Manual of Comparative Anatomy* (may it be d—d), which I have had in hand these seven years.

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\* Delivered on Friday evenings from April to June at Jermyn Street, and reported in the *Medical Times*. They formed the basis of his well-known little book on *Elementary Physiology*, published 1866. He writes on April 22:—"Macmillan has just been with me, and I am let in for a school book on physiology based on these lectures of mine. Money arrangements not quite fixed yet, but he is a good fellow, and will not do me unnecessarily."

E. Getting heaps of remains of new Labyrinthodonts from the Glasgow coalfield, which have to be described.

F. Working at a memoir on *Glyptodon* based on a new and almost entire specimen at the College of Surgeons.

G. Preparing a new decade upon Fossil fishes for this place.

H. Knowing that I ought to have written long ago a description of a most interesting lot of Indian fossils sent to me by Oldham.

I. Being blown up by Hooker for doing nothing for the *Natural History Review*.

K. Being bothered by sundry editors just to write articles "which you know you can knock off in a moment."

L. Consciousness of having left unwritten letters which ought to have been written long ago, especially to C. Darwin.

M. General worry and botheration. Ten or twelve people taking up my time all day about their own affairs.

N. O. P. Q. R. S. T. U. V. W. X. Y. Z.

Societies.

Clubs.

Dinners, evening parties, and all the apparatus for wasting time called "Society." Colensoism and botheration about Moses. . . . Finally pestered to death in public and private because I am supposed to be what they call a "Darwinian."

If that is not enough, I could exhaust the Greek alphabet for heads in addition.

I am glad to hear that Wyman thinks well of my book, as he is very competent to judge. I hear it is republished in America, but I suppose I shall get nothing out of it.\*

An undated letter to Kingsley, who had suggested that he should write an article on Prayer, belongs probably to the autumn of 1863:—

I should like very much to write such an article as you suggest, but I am very doubtful about undertaking it for *Fraser*. Anything I could say would go to the root of praying altogether, for inasmuch as the whole universe is governed, so far as I can see, in the same way, and the moral world is as much governed by laws as the physical—whatever militates against asking for one sort of blessing seems to me to tell with the same force against asking for any other.

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\* In this expectation, however, he was agreeably disappointed by the action of D. Appleton and Company, as is told on page 305.

Not that I mean for a moment to say that prayer is illogical, for if the whole universe is ruled by fixed laws it is just as logically absurd for me to ask you to answer this letter as to ask the Almighty to alter the weather. The whole argument is an "old foe with a new face," the freedom and necessity question over again.

If I were to write about the question I should have to develop all this side of the problem, and then having shown that logic, as always happens when it is carried to extremes, leaves us *bombinantes in vacuo*, I should appeal to experience to show that prayers of this sort are not answered, and to science to prove that if they were they would do a great deal of harm.

But you know this would never do for the atmosphere of *Fraser*. It would be much better suited for an article in my favourite organ, the wicked *Westminster*.

However, to say truth, I do not see how I am to undertake anything fresh just at present. I have promised an article for *Macmillan* ages ago; and Masson scowls at me whenever we meet. I am afraid to go through the Albany lest Cook should demand certain reviews of books which have been long in my hands. I am just completing a long memoir for the Linnean Society; a monograph on certain fossil reptiles must be finished before the new year. My lectures have begun, and there is a certain "Manual" looming in the background. And to crown all, these late events \* have given me such a wrench that I feel I must be prudent.

The following reference to Robert Lowe, afterwards Lord Sherbrooke, has a quasi-prophetic interest:—

*May 7.*—Dined at the Smiths' † last night. Lowe was to have been there, but had a dinner-party of his own. . . . I have come to the conviction that our friend Bob is a most admirable, well-judging statesman, for he says I am the only man fit to be at the head of the British Museum, ‡ and that if he had his way he would put me there.

Years afterwards, on Sir R. Owen's retirement, he was offered the post, but declined it, as he greatly disliked the kind of work. At the same time, he pointed out to the

\* The death of his brother.

† Dr. (afterwards Sir William) Smith, of dictionary fame.

‡ *i.e.* of the Natural History Collections.

Minister who made the offer that the man of all others for the post would be the late distinguished holder of it, Sir W. H. Flower, a suggestion happily acted on.

Early in August a severe loss befell him in the sudden death of his brother George, who had been his close friend ever since he had returned from Australia, who had given him all the help and sympathy in his struggles that could be given by a man of the world without special interests in science or literature. With brilliancy enough to have won success if he had had patience to ensure it, he was not only a pleasant companion, a "clubbable man" in Johnson's phrase, but a friend to trust. The two households had seen much of one another; the childless couple regarded their brother's children almost as their own. Thus a real gap was made in the family circle, and the trouble was not lessened by the fact that George Huxley's affairs were left in great confusion, and his brother not only spent a great deal of time in looking after the interests of the widow, but took upon himself certain obligations in order to make things straight, with the result that he was even compelled to part with his Royal Medal, the gold of which was worth £50.

## CHAPTER XVIII

1864

THE year 1864 was much like 1863. The Hunterian Lectures were still part of his regular work. The Fishery Commission claimed a large portion of his time. From March 28 to April 2 he was in Cornwall; on May 7 at Shoreham; from July 24 to September 9 visiting the coasts of Scotland and Ireland. The same pressure of work continued. He published four papers on paleontological or anatomical subjects in the *Natural History Review*,\* he wrote "Further Remarks upon the Human Remains from the Neanderthal," and later (see pp. 273 and 288), dealing with "Criticisms on the *Origin of Species*" (*Collected Essays II.* p. 80, "Darwiniana"), he gently but firmly dispersed several misconceptions of his old friend Kölliker as to the plain meaning of the book; and ridiculed the pretentious ignorance of M. Flourens' dicta upon the same subject; while in the winter he delivered a course of lectures to workmen on "The Various Races of Mankind," a choice of subject which shows that his chief interest at that time lay in Ethnology.

JERMYN STREET, Jan. 16, 1864.

MY DEAR DARWIN—I have had no news of you for a long time, but I earnestly hope you are better.

Have you any objection to putting your name to Flower's certificate for the Royal Society herewith inclosed? It will

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\* On "Cetacean Fossils termed *Ziphius* by Cuvier," in the *Transactions of the Geological Society*; in those of the *Zoological*, papers on "*Arctocebus Calabarensis*" and "the Structure of the Stomach in *Desmodus Rufus*"; and on the "Osteology of the Genus *Glyptodon*," in the *Phil. Trans.*

please him much if you will; and I go bail for his being a thoroughly good man in all senses of the word—which, as you know, is more than I would say for everybody.

Don't write any reply; but Mrs. Darwin perhaps will do me the kindness to send the thing on to Lyell as per enclosed envelope. I will write him a note about it.

We are all well, barring customary colds and various forms of infantile pip. As for myself, I am flourishing like a green bay tree (appropriate comparison, Soapy Sam would observe), in consequence of having utterly renounced societies and society since October.

I have been working like a horse, however, and shall work "horser" as my college lectures begin in February.—*Tout à vous,*

T. H. HUXLEY.

ROYAL SCHOOL OF MINES,  
JERMYN STREET, April 18, 1864.

MY DEAR DARWIN—I was rejoiced to see your handwriting again, so much so that I shall not scold you for undertaking the needless exertion (as it's my duty to do) of writing to thank me for my book.\*

I thought the last lecture would be nuts for you, but it is really shocking. There is not the smallest question that Owen wrote both the article "Oken" and the *Archetype* Book, which appeared in its second edition in French—why, I know not. I think that if you will look at what I say again, there will not be much doubt left in your mind as to the identity of the writer of the two.

The news you give of yourself is most encouraging; but pray don't think of doing any work again yet. Careful as I have been during this last winter not to burn the candle at both ends, I have found myself, since the pressure of my lectures ceased, in considerable need of quiet, and I have been lazy accordingly.

I don't know that I fear, with you, caring too much for science—for there are lots of other things I should like to go into as well, but I do lament more and more as time goes on, the necessity of becoming more and more absorbed in one kind of work, a necessity which is created for any one in my position, partly by one's reputation, and partly by one's children. For directly a man gets the smallest repute in any branch of science, the world immediately credits him with knowing about ten

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\* *Hunterian Lectures on Anatomy.*

times as much as he really does, and he becomes bound in common honesty to do his best to climb up to his reputed place. And then the babies are a devouring fire, eating up the present and discounting the future; they are sure to want all the money one can earn, and to be the better for all the credit one can win.

However, I should fare badly without the young monkeys. Your pet Marian is almost as shy as ever, though she has left off saying "can't," by the way.

My wife is wonderfully well. As I tell her, Providence has appointed her to take care of me when I am broken down and decrepit.

I hope you can say as much of Mrs. Darwin. Pray give her my kind regards.—And believe me, ever yours faithfully,

T. H. HUXLEY.

A letter to his sister gives a sketch of his position at this time, speaking of which he says to Dr. (afterwards Sir J.) Fayrer, "You and I have travelled a long way, in all senses, since you settled my career for me on the steps of the Charing Cross Hospital." It must be remembered that his sister was living in Tennessee, and that her son at fifteen was serving in the Confederate army.

JERMYN STREET, 4/5/64.

You will want to know something about my progress in the world. Well, at this moment I am Professor of Natural History here, and Hunterian Professor of Comparative Anatomy at the College of Surgeons. The former is the appointment I have held since 1855; the latter chair I was asked to take last year, and now I have delivered two courses in that famous black gown with the red facings which the doctor will recollect very well. What with the duties of these two posts and other official and non-official business, I am worked to the full stretch of my powers, and sometimes a little beyond them; though hitherto I have stood the wear and tear very well.

I believe I have won myself a pretty fair place in science, but in addition to that I have the reputation (of which, I fear, you will not approve) of being a great heretic and a savage controversialist always in rows. To the accusation of heresy I fear I must plead guilty; but the second charge proceeds only. I do assure you, from a certain unconquerable hatred of lies and humbug which I cannot get over.

I have read all you tell me about the south with much interest and with the warmest sympathy, so far as the fate of the south affects you. But I am in the condition of most thoughtful Englishmen. My heart goes with the south, and my head with the north.

I have no love for the Yankees, and I delight in the energy and self-sacrifice of your people; but for all that, I cannot doubt that whether you beat the Yankees or not, you are struggling to uphold a system which must, sooner or later, break down.

I have not the smallest sentimental sympathy with the negro; don't believe in him at all, in short. But it is clear to me that slavery means, for the white man, bad political economy; bad social morality; bad internal political organisation, and a bad influence upon free labour and freedom all over the world. For the sake of the white man, therefore, for your children and grandchildren, directly, and for mine, indirectly, I wish to see this system ended.\* Would that the south had had the wisdom to initiate that end without this miserable war!

All this must jar upon you sadly, and I grieve that it does so; but I could not pretend to be other than I am, even to please you. Let us agree to differ upon this point. If I were in your place I doubt not I should feel as you do; and, when I think of you, I put myself in your place and feel with you as your brother Tom. The learned gentleman who has public opinions for which he is responsible is another "party" who walks about in T's clothes when he is not thinking of his sister.

If this were not my birthday I should not feel justified in taking a morning's holiday to write this long letter to you. The ghosts of undone pieces of work are dancing about me, and I must come to an end.

Give my love to your husband. I am glad to hear he wears so well. And don't forget to give your children kindly thoughts of their uncle. Dr. Wright gives a great account of my namesake, and says he is the handsomest youngster in the Southern States. That comes of his being named after me, you know how renowned for personal beauty I always was.

I asked Dr. Wright if you had taken to spectacles, and he seemed to think not. I had a pain about my eyes a few months

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\* Cf. *Reader*, February 27 onwards, where these general arguments against slavery appear in a controversy arising from his ninth Hunterian Lecture, in which, while admitting negro inferiority, he refutes those who justify slavery on the ground that physiologically the negro is very low in the scale.



ago, but I found spectacles made this rather worse and left them off again. However, I do catch myself holding a newspaper further off than I used to do.

Now don't let six months go by without writing again. If our little venture succeeds this time, we shall send again.\*—  
Ever, my dearest Lizzie, your affectionate brother,

T. H. HUXLEY.

He writes to his wife, who had taken the children to Margate:—

Sept. 22.—I am now busy over a paper for the Zool. Soc.; after that there is one for the Ethnological which was read last session though not written. . . . Don't blaspheme about going into the bye-ways. They are both in the direct road of the book, only over the hills instead of going over the beaten path.

Oct. 6.—I heard from Darwin last night jubilating over an article of mine which is published in the last number of the *Nat. Hist. Review*, and which he is immensely pleased with. . . . My lectures tire me, from want of practice, I suppose. I shall soon get into swing.

The article in question was the "Criticisms of the *Origin of Species*," of which he writes to Darwin:—

JERMYN STREET, Oct. 5, 1864.

MY DEAR DARWIN—I am very glad to see your handwriting (in ink) again, and none the less on account of the pretty words into which it was shaped.

It is a great pleasure to me that you like the article, for it was written very hurriedly, and I did not feel sure when I had done that I had always rightly represented your views.

Hang the two scalps up in your wigwam!

Flourens I could have believed anything of, but how a man of Kölliker's real intelligence and ability could have so misunderstood the question is more than I can comprehend.

It will be a thousand pities, however, if any review interferes with your saying something on the subject yourself. Unless it should give you needless work I heartily wish you would.

Everybody tells me I am looking so exceedingly well that I am ashamed to say a word to the contrary. But the fact is, I get no exercise, and a great deal of bothering work on our Com-

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\* *i.e.* a package of various presents to the family.

mission's Cruise; and though much fatter (indeed a regular bloater myself), I am not up to the mark. Next year I will have a real holiday.\*

I am a bachelor, my wife and belongings being all at that beautiful place, Margate. When I came back I found them all looking so seedy that I took them off bag and baggage to that, as the handiest place, before a week was over. They are wonderfully improved already, my wife especially being abundantly provided with her favourite east wind. Your godson is growing a very sturdy fellow, and I begin to puzzle my head with thinking what he is and what he is not to be taught.

Please to remember me very kindly to Mrs. Darwin, and believe me, yours very faithfully,

T. H. HUXLEY.

The following illustrates the value he set upon public examinations as to a practical means for spreading scientific education, and upon first-rate examiners as a safeguard of proper methods of teaching.

*Oct. 6, 1864.*

MY DEAR HOOKER—Donnelly told me to-day that you had been applied to by the Science and Arts Department to examine for them in botany, and that you had declined.

Will you reconsider the matter? I have always taken a very great interest in the science examinations, looking upon them, as I do, as the most important engine for forcing science into ordinary education.

The English nation will not take science from above, so it must get it from below.

Having known these examinations from the beginning, I can assure you that they are very genuine things, and are working excellently. And what I have regretted from the first is that the botanical business was not taken in hand by you, instead of by —.

Now, like a good fellow, think better of it. The papers are necessarily very simple, and one of Oliver's pupils could look them over for you. Let us have your co-operation and the advantage of that reputation for honesty and earnestness which you have contrived (Heaven knows how) to get.

I have come back fat and seedy for want of exercise. All

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\* At the end of the year, as so often, he went off for a ploy with Tyndall, this time into Derbyshire, walking vigorously over the moors.

my belongings are at Margate. Hope you don't think my review of Darwin's critics too heretical if you have seen it.—Ever yours faithfully,

T. H. HUXLEY.

When is our plan for getting some kind of meetings during the winter to be organised?

The next two letters refer to the award of the Copley Medal to Mr. Darwin. Huxley was exceedingly indignant at an attempt on the part of the president to discredit the *Origin* by a side wind:—

JERMYN STREET, Nov. 4, 1864.

MY DEAR DARWIN—I write two lines which are *not to be answered*, just as to say how delighted I am at the result of the doings of the Council of the Royal Society yesterday. Many of us were somewhat doubtful of the result, and the more ferocious sort had begun to whet their beaks and sharpen their claws in preparation for taking a very decided course of action had there been any failure of justice this time. But the affair was settled by a splendid majority, and our ruffled feathers are smoothed down.

Your well-won reputation would not have been lessened by the lack of the Copley, but it would have been an indelible reproach to the Royal Society not to have given it you, and a good many of us had no notion of being made to share that ignominy.

But quite apart from all these grand public-spirited motives and their results, you ought as a philanthropist to be rejoiced in the great satisfaction the award has given to your troops of friends, to none more than my wife (whom I woke up to tell the news when I got home late last night).—Yours ever,

T. H. HUXLEY.

Please remember us kindly to Mrs. Darwin, and make our congratulations to her on owning a Copley medallist.

JERMYN STREET, Dec. 3, 1864.

MY DEAR HOOKER—I wish you had been at the Anniversary Meeting and Dinner, because the latter was very pleasant, and the former, to me, very disagreeable. My distrust of Sabine is as you know chronic, and I went determined to keep careful watch on his address, lest some crafty phrase injurious to Darwin should be introduced. My suspicions were justified. The

only part of the address to Darwin written by Sabine himself contained the following passage:—

“Speaking generally and collectively, we have expressly omitted it (Darwin’s theory) from the grounds of our award.”

Of course this would be interpreted by everybody as meaning that, after due discussion, the council had formally resolved not only to exclude Darwin’s theory from the grounds of the award, but to give public notice through the president that they had done so, and furthermore, that Darwin’s friends had been base enough to accept an honour for him on the understanding that in receiving it he should be publicly insulted!

I felt that this would never do, and therefore when the resolution for printing the address was moved, I made a speech which I took care to keep perfectly cool and temperate, disavowing all intention of interfering with the liberty of the president to say what he pleased, but exercising my constitutional right of requiring the minutes of council making the award to be read, in order that the Society might be informed whether the conditions implied by Sabine had been imposed or not.

The resolution was read, and of course nothing of the kind appeared. Sabine didn’t exactly like it, I believe. Both Busk and Falconer remonstrated against the passage to him, and I hope it will be withdrawn when the address is printed.\*

If not there will be an awful row, and I for one will show no mercy.—Ever yours faithfully,

T. H. HUXLEY.

The foundation of the *x* Club towards the end of 1864 was a notable event for Huxley and his circle of scientific friends. It was growing more and more difficult for them to see one another except now and again at meetings of the learned societies, and even that was quite uncertain. The pressure of Huxley’s own work may be inferred from his letters at this time (especially to Darwin, July 2, 1863, and January 16, 1864). Not only society, but societies had to be almost entirely given up. Moreover, the distance from one another at which some of these friends lived, added another difficulty, so that Huxley writes to Hooker in his “remote province” of Kew: “I wonder if we are ever to meet again in this world.” Accordingly in January 1864,

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\* The passage stands in the published address, but followed by another passage which softens it down.

Hooker gladly embraced a proposal of Huxley's to organise some kind of regular meeting, a proposal which bore fruit in the establishment of the *x* Club. On November 3, 1864, the first meeting was held at St. George's Hotel, Albemarle Street, where they resolved to dine regularly "except when Benham cannot have us, in which case dine at the Athenæum." In the latter eighties, however, the Athenæum became the regular place of meeting, and it was here that the "coming of age" of the club was celebrated in 1885.

Eight members met at the first meeting; the second meeting brought their numbers up to nine by the addition of W. Spottiswoode, but the proposal to elect a tenth member was never carried out. On the principle of *lucus a non lucendo*, this lent an additional appropriateness to the symbol *x*, the origin of which Huxley thus describes in his reminiscences of Tyndall in the *Nineteenth Century* for January 1894:—

At starting, our minds were terribly exercised over the name and constitution of our society. As opinions on this grave matter were no less numerous than the members—indeed more so—we finally accepted the happy suggestion of our mathematicians to call it the *x* Club; and the proposal of some genius among us, that we should have no rules, save the unwritten law not to have any, was carried by acclamation.

Besides Huxley, the members of the club were as follows:—

George Busk, F.R.S. (1807–87), then secretary of the Linnean Society, a skilful anatomist.\*

Edward Frankland (1825–1899), For. Sec. R.S., K.C.B., then Professor of Chemistry in the Royal Institution, and afterwards at the Royal College of Science.

Thomas Archer Hirst, F.R.S., then mathematical master at University College School.†

\* He served as surgeon to the hospital ship *Dreadnought* at Greenwich till 1856, when he resigned, and, retiring from practice, devoted himself to scientific pursuits, and was elected President of the College of Surgeons in 1871.

† In 1865 appointed Professor of Physics; in 1867, of Pure Mathematics, at University College, London; and from 1873 to 1883 Director

Joseph Dalton Hooker, F.R.S., K.C.S.I., Pres. R.S. 1873, the great botanist, then Assistant Director at Kew Gardens to his father, Sir William Hooker.

Sir John Lubbock, Bart., F.R.S., M.P., the youngest of the nine, who had already made his mark in archæology, and was then preparing to bring out his *Prehistoric Times*.

Herbert Spencer, who had already published *Social Statistics*, *Principles of Psychology*, and *First Principles*.

William Spottiswoode (1825-1883), F.R.S., Treasurer and afterwards President R.S. 1878, who carried on the business of the Queen's printer as well as being deeply versed in mathematics, philosophy, and languages.

John Tyndall, F.R.S. (1820-1893), who had been for the last eleven years Professor of Natural Philosophy at the Royal Institution, where he succeeded Faraday as superintendent.

The one object, then, of the club was to afford a certain meeting-ground for a few friends who were bound together by personal regard and community of scientific interests, yet were in danger of drifting apart under the stress of circumstances. They dined together on the first Thursday in each month, except July, August, and September, before the meeting of the Royal Society, of which all were members excepting Mr. Spencer, the usual dining hour being six, so that they should be in good time for the society's meeting at eight; and a minute of December 5, 1885, when Huxley was treasurer and revived the ancient custom of making some note of the conversation, throws light on the habits of the club. "Got scolded," he writes, "for dining at 6.30. Had to prove we have dined at 6.30 for a long time by evidence of waiter. (At the February meeting, however, "agreed to fix dinner hour six hereafter.") Talked politics, scandal, and the three classes of witnesses—liars, d—d liars, and experts. Huxley gave account of civil list pension. Sat to the unexampled hour of 10 P.M., except Lubbock who had to go to Linnæan."

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of Naval Studies at the Royal Naval College, Greenwich; an old Marburg student, and intimate friend of Tyndall, whom he had succeeded at Queenwood College in 1853. He died in 1892.

For some time there was a summer meeting, which consisted of a week-end excursion of members and their wives ( $x$ 's +  $y$ 's, as the correct formula ran) to some place like Burnham or Maidenhead, Oxford or Windsor; but this grew increasingly difficult to arrange, and dropped before very long.

Guests were not excluded from the dinners of the club; men of science or letters of almost every nationality dined with the  $x$  at one time or another; Darwin, W. K. Clifford, Colenso, Strachey, Tollemache, Helps; Professors Bain, Masson, Robertson Smith, and Bentham the botanist, Mr. John Morley, Sir D. Galton, Mr. Jodrell, the founder of several scientific lectureships; Dr. Klein; the Americans Marsh, Gilman, A. Agassiz, and Youmans, the latter of whom met here several of the contributors to the *International Science Series* organized by him; and continental representatives, as Helmholtz, Laugel, and Cornu.

Small as the club was, the members of it were destined to play a considerable part in the history of English science. Five of them received the Royal Medal; three the Copley; one the Rumford; six were Presidents of the British Association; three Associates of the Institute of France; and from amongst them the Royal Society chose a Secretary, a Foreign Secretary, a Treasurer, and three successive Presidents.

I think, originally (writes Huxley, *l.c.*) there was some vague notion of associating representatives of each branch of science; at any rate, the nine who eventually came together could have managed, among us, to contribute most of the articles to a scientific Encyclopædia.

They included leading representatives of half a dozen branches of science:—mathematics, physics, philosophy, chemistry, botany, and biology; and all were animated by similar ideas of the high function of science, and of the great Society which should be the chief representative of science in this country. However unnecessary, it was perhaps not unnatural that a certain jealousy of the club and its possible influence grew up in some quarters. But whatever influence fell to it as it were incidentally—and earnest

men with such opportunities of mutual understanding and such ideals of action could not fail to have some influence on the progress of scientific organization—it was assuredly not sectarian nor exerted for party purposes during the twenty-eight years of the club's existence.

I believe that the  $x$  (continues Huxley) had the credit of being a sort of scientific caucus, or ring, with some people. In fact, two distinguished scientific colleagues of mine once carried on a conversation (which I gravely ignored) across me, in the smoking-room of the Athenæum, to this effect, "I say, A., do you know anything about the  $x$  Club?" "Oh yes, B., I have heard of it. What do they do?" "Well, they govern scientific affairs, and really, on the whole, they don't do it badly." If my good friends could only have been present at a few of our meetings, they would have formed a much less exalted idea of us, and would, I fear, have been much shocked at the sadly frivolous tone of our ordinary conversation.

The  $x$  club is probably unique in the smallness of its numbers, the intellectual eminence of its members, and the length of its unchanged existence. The nearest parallel is to be found in "The Club." \* Like the  $x$ , "The Club" began with eight members at its first meeting, and of the original members Johnson lived twenty years, Reynolds twenty-eight, Burke thirty-three, and Bennet Langton thirty-seven. But the ranks were earlier broken. Within ten years Goldsmith died, and he was followed in a twelvemonth by Nugent, and five years later by Beauclerk and Chamier. Moreover, the eight were soon increased to twelve; then to twenty and finally to forty, while the gaps were filled up as they occurred.

In the  $x$ , on the contrary, nearly nineteen years passed before the original circle was broken by the death of Spottiswoode. From 1864 to Spottiswoode's death in 1883 the original circle remained unbroken; the meetings "were steadily continued for some twenty years, before our ranks began to thin; and one by one, *geistige Naturen* such as

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\* Of which Huxley was elected a member in 1884. Tyndall and Hooker were also members.



those for which the poet\* so willingly paid the ferryman, silent but not unregarded, took the vacated places." The peculiar constitution of the club scarcely seemed to admit of new members; not, at all events, without altering the unique relation of friendship joined to common experience of struggle and success which had lasted so long. After the death of Spottiswoode and Busk, and the ill-health of other members, the election of new members was indeed mooted, but the proposal was ultimately negatived. Huxley's opinion on this point appears from letters to Sir E. Frankland in 1886 and to Sir J. D. Hooker in 1888.

As for the filling up the vacancies in the *x*, I am disposed to take Tyndall's view of the matter. Our little club had no very definite object beyond preventing a few men who were united by strong personal sympathies from drifting apart by the pressure of busy lives.

Nobody could have foreseen or expected twenty odd years ago when we first met, that we were destined to play the parts we have since played, and it is in the nature of things impossible that any of the new members proposed (much as we may like and respect them all), can carry on the work which has so strangely fallen to us.

An axe with a new head and a new handle may be the same axe in one sense, but it is not the familiar friend with which one has cut one's way through wood and brier.

And in the other letter—

What with the lame dog condition of Tyndall and Hirst and Spencer and my own recurrent illnesses, the *x* is not satisfactory. But I don't see that much will come from putting new patches in. The *x* really has no *raison d'être* beyond the personal attachment of its original members. Frankland told me of the names that had been mentioned, and none could be more personally welcome to me . . . but somehow or other they seem out of place in the *x*.

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\* Nimm dann Fuhrmann,  
Nimm die Miethc  
Die Ich gerne dreifach biete ;  
Zwei, die eben überfuhren  
Waren geistige Naturen.

However, I am not going to stand out against the general wish, and I shall agree to anything that is desired.

Again—

The club has never had any purpose except the purely personal object of bringing together a few friends who did not want to drift apart. It has happened that these cronies had developed into big-wigs of various kinds, and therefore the club has incidentally—I might say accidentally—had a good deal of influence in the scientific world. But if I had to propose to a man to join, and he were to say, Well, what is your object? I should have to reply like the needy knife-grinder, “Object, God bless you, sir, we’ve none to show.”

As he wrote elsewhere (*loc. cit.*):—

Later on, there were attempts to add other members, which at last became wearisome, and had to be arrested by the agreement that no proposition of that kind should be entertained, unless the name of the new member suggested contained all the consonants absent from the names of the old ones. In the lack of Slavonic friends this decision put an end to the possibility of increase.

After the death, in February 1892, of Hirst, a most devoted supporter of the club, who “would, I believe, represent it in his sole person rather than pass the day over,” only one more meeting took place, in the following month. With five of the six survivors domiciled far from town, meeting after meeting fell through, until the treasurer wrote, “My idea is that it is best to let it die out unobserved, and say nothing about its decease to anyone.”

Thus it came to pass that the March meeting of the club in 1893 remained its last. No ceremony ushered it out of existence. Its end exemplified a saying of Sir J. Hooker’s, “At our ages clubs are an anachronism.” It had met 240 times, yet, curious to say, although the average attendance up to 1883 was seven out of nine, the full strength of the club only met on twenty-seven occasions.

## CHAPTER XIX

1865

THE progress of the American civil war suggested to Huxley in 1865 the text for an article, "Emancipation, Black and White," the emancipation of the negro in America and the emancipation of women in England, which appeared in the *Reader* of May 20 (*Coll. Ess.* iii. 66). His main argument for the emancipation of the negro was that already given in his letter to his sister (p. 272); namely, that in accordance with the moral law that no human being can arbitrarily dominate over another without grievous damage to his own nature, the master will benefit by freedom more than the freed-man. And just as the negro will never take the highest places in civilisation yet need not to be confined to the lowest, so, he argues, it will be with women. "Nature's old salique law will never be repealed, and no change of dynasty will be effected," although "whatever argument justifies a given education for all boys justifies its application to girls as well."

With this may be compared his letter to the *Times* of July 8, 1874 (Chapter XXVII).

No scientific monographs were published in 1865 by Huxley, but his lectures of the previous winter to working-men on "The Various Races of Mankind" are an indication of his continued interest in Ethnology, which, set going, as has been said, by the promise to revise the woodcuts for Lyell's book, found expression in such papers as the "Human Remains in the Shell Mounds," 1863; the "Neanderthal Remains" of 1864; the "Methods and Results of Ethnology" of 1865; his Fullerian Lectures of

1866-67; papers on "Two Widely Contrasted Forms of the Human Cranium" of 1866 and 1868; the "Patagonian Skulls" of 1868; and "Some Fixed Points in British Ethnology" of 1871—

His published ethnological papers (says Sir Michael Foster) are not numerous, nor can they be taken as a measure of his influence on this branch of study. In many ways he has made himself felt, not the least by the severity with which on the one hand he repressed the pretensions of shallow persons who, taking advantage of the glamour of the Darwinian doctrine, talked nonsense in the name of anthropological science, and on the other hand, exposed those who in the structure of the brain or of other parts, saw an impassable gulf between man and the monkey. The episode of the "hippocampus" stirred for a while not only science but the general public. He used his influence, already year by year growing more and more powerful, to keep the study of the natural history of man within its proper lines, and chiefly with this end in view held the Presidential Chair of the Ethnological Society in 1869-70. It was mainly through his influence that this older Ethnological Society was, a year later, in 1871, amalgamated with a newer rival society, the Anthropological, under the title of "The Anthropological Institute."

During this time he was constantly occupied with paleontological work, as, the following letter to Sir C. Lyell indicates—

JERMYN STREET, Nov. 27, 1865.

MY DEAR SIR CHARLES—I returned last night from a hasty journey to Ireland, whither I betook myself on Thursday night, being attracted vulture-wise by the scent of a quantity of carboniferous corpses. The journey was as well worth the trouble as any I ever undertook, seeing that in a morning's work I turned out ten genera of vertebrate animals of which five are certainly new; and of these four are *Labyrinthodonts*, amphibia of new types. These four are baptised *Ophiderpeton*, *Lepterpeton*, *Ichthyerpeton*, *Keraterpeton*. They all have ossified spinal columns and limbs. The special interest attaching to the two first is that they represent a type of *Labyrinthodonts* hitherto unknown, and corresponding with *Siren* and *Amphiura* among living Amphibia. *Ophiderpeton*, for example, is like an eel, about three feet long with small fore legs and rudimentary hind ones.

In the year of grace 1861, there were three genera of European carboniferous Labyrinthodonts known, *Archegosaurus*, *Sclerocephalus*, *Parabatrachus*.

The vertebral column of *Archegosaurus* was alone known, and it was in a remarkably imperfect state of ossification. Since that date, by a succession of odd chances, seven new genera have come into my hands, and of these six certainly have well-ossified and developed vertebral columns.

I reckon there are now about thirty genera of Labyrinthodonts known from all parts of the world and all deposits. Of these eleven have been established by myself in the course of the last half-dozen years, upon remains which have come into my hands by the merest chance.

Five and twenty years ago, all the world but yourself believed that a vertebrate animal of higher organisation than a fish in the carboniferous rocks never existed. I think the whole story is not a bad comment upon negative evidence.

Jan. 1, 1865.

MY DEAR DARWIN—I cannot do better than write my first letter of the year to you, if it is only to wish you and yours your fair share (and more than your fair share, if need be) of good for the New Year. The immediate cause of my writing, however, was turning out my pocket and finding therein an unanswered letter of yours containing a scrap on which is a request for a photograph, which I am afraid I overlooked. At least I hope I did, and then my manners won't be so bad. I enclose the latest version of myself.

I wish I could follow out your suggestion about a book on zoology. (By the way please to tell Miss Emma that my last book *is* a book.\* Marry come up! Does her ladyship call it a pamphlet?)

But I assure you that writing is a perfect pest to me unless I am interested, and not only a bore but a very slow process. I have some popular lectures on Physiology,† which have been

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\* The first volume of his Hunterian Lectures on *Comparative Anatomy*. A second volume never appeared. Miss Darwin, as her father wrote to Huxley after the delivery of his Working Men's Lectures in 1862, "was reading your Lectures, and ended by saying, 'I wish he would write a book.' I answered, 'he has just written a great book on the skull.' 'I don't call that a book,' she replied, and added, 'I want something that people can read; he does write so well.'"

† See letter of April 22, 1863.

half done for more than a twelvemonth, and I hate the sight of them because the subject no longer interests me, and my head is full of other matters.

So I have just done giving a set of lectures to working-men on "The Various Races of Mankind," which really would make a book in Miss Emma's sense of the word, and which I have had reported. But when am I to work them up? Twenty-four Hunterian Lectures loom between me and Easter. I am dying to get out the second volume of the book that is not a book, but in vain.

I trust you are better, though the last news I had of you from Lubbock was not so encouraging as I could have wished.

With best wishes and remembrances to Mrs. Darwin—Ever yours,  
T. H. HUXLEY.

Thanks for "fin Darwin," I had it.

26 ABBEY PLACE, *Jan. 15, 1865.*

MY DEAR DARWIN—Many thanks for Deslongchamps' paper which I do not possess.

I received another important publication yesterday morning in the shape of a small but hearty son, who came to light a little before six. The wife is getting on capitally, and we are both greatly rejoiced at having another boy, as your godson ran great risks of being spoiled by a harem of sisters.

The leader in the *Reader* is mine, and I am glad you like it. The more so as it has got me into trouble with some of my friends. However, the revolution that is going on is not to be made with rose-water.

I wish if anything occurs to you that would improve the scientific part of the *Reader*, you would let me know as I am in great measure responsible for it.

I am sorry not to have a better account of your health. With kind remembrances to Mrs. Darwin and the rest of your circle—Ever yours faithfully,  
T. H. HUXLEY.

JERMYN STREET, *May 1, 1865.*

MY DEAR DARWIN—I send you by this post a booklet \* none of which is much worth your reading, while of nine-tenths of it you may say as the man did who had been trying to read Johnson's *Dictionary*, "that the words were fine, but he couldn't make much of the story."

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\* Probably "A Catalogue of the Collection of Fossils in the Museum of Practical Geology," etc.

But perhaps the young lady who has been kind enough to act as taster of my books heretofore will read the explanatory notice, and give me her ideas thereupon (always recollecting that almost the whole of it was written in the pre-Darwinian epoch.)

I do not hear very good accounts of you—to my sorrow—though rumours have reached me that the *opus magnum* \* is completely developed though not yet born.

I am grinding at the mill and getting a little tired. My belongings flourishing as I hope you are.—Ever yours faithfully,  
T. H. HUXLEY.

JERMYN STREET, *May* 29, 1865.

MY DEAR DARWIN—I meant to have written to you yesterday to say how glad I shall be to read whatever you like to send me.

I have to lecture at the Royal Institution this week, but after Friday, my time will be more at my own disposal than usual; and as always I shall be most particularly glad to be of any use to you.

Any glimmer of light on the question you speak of is of the utmost importance, and I shall be immensely interested in learning your views. And of course I need not add I will do my best to upset them. That is the nature of the beast.

I had a letter from one of the ablest of the younger zoologists of Germany, Haeckel, the other day, in which this passage occurs:—

“The Darwinian Theory, the establishment and development of which is the object [of] all my scientific labours, has gained ground immensely in Germany (where it was at first so misunderstood) during the last two years, and I entertain no doubt that it will before long be everywhere victorious.” And he adds that I dealt far too mildly with Kölliker.

With kindest remembrances to Mrs. Darwin and your family  
—Ever yours faithfully,  
T. H. HUXLEY.

This year, as is seen from the foregoing, he was again in direct communication with Professor Ernst Haeckel of Jena, the earliest and strongest champion of Darwinian ideas in Germany. The latter wished to enlarge his observations by joining some English scientific expedition, if any such were in preparation, but was dissuaded by the fol-

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\* On *Pangensis*.

lowing reply. The expected book of Darwin's was the *Pangensis*, and this is also referred to in the three succeeding letters to Darwin himself.

THE ROYAL SCHOOL OF MINES,  
JERMYN STREET, LONDON, *June 7, 1865.*

MY DEAR SIR—Many thanks for your letter, and for the welcome present of your portrait, which I shall value greatly, and in exchange for which I enclose my own. Indeed I have delayed writing to you in order to be able to send the last "new and improved" edition of myself.

I wish it were in my power to help you to any such appointment as that you wish for. But I do not think our government is likely to send out any scientific expedition to the South Seas. There is a talk about a new Arctic expedition, but I doubt if it will come to much, and even if it should be organised I could not recommend your throwing yourself away in an undertaking which promises more frost-bites than anything else to a naturalist.

In truth, though I have felt and can still feel the attraction of foreign travel in all its strength, I would counsel you to stop at home, and as Goethe says, find your America here. There are plenty of people who can observe and whose places, if they are expended by fever or shipwreck, can be well enough filled up. But there are very few who can grapple with the higher problems of science as you have done and are doing, and we cannot afford to lose you. It is the organisation of knowledge rather than its increase which is wanted just now. And I think you can help in this great undertaking better in Germany than in New Zealand.

Darwin has been very ill for more than a year past, so ill, in fact, that his recovery was at one time doubtful. But he contrives to work in spite of fate, and I hope that before long we shall have a new book from him.

By way of consolation I sent him an extract from your letter touching the progress of his views.

I am glad that you did not think my critique of Kölliker too severe. He is an old friend of mine, and I desired to be as gentle as possible, while performing the unpleasant duty of showing how thoroughly he had misunderstood the question.

I shall look with great interest for your promised book. Lately I have [been] busy with Ethnological questions, and I fear I shall not altogether please your able friend Professor



Schleicher in some remarks I have had to make upon the supposed value of philological evidence.

May we hope to see you at the meeting of the British Association at Birmingham? It would give many, and especially myself, much pleasure to become personally acquainted with you.—Ever yours faithfully,  
T. H. HUXLEY.

JERMYN STREET, *June 1, 1865.*

MY DEAR DARWIN—Your MS.\* reached me safely last evening.

I could not refrain from glancing over it on the spot, and I perceive I shall have to put on my sharpest spectacles and best considering cap.

I shall not write till I have thought well on the whole subject.—Ever yours,  
T. H. HUXLEY.

JERMYN STREET, *July 16, 1865.*

MY DEAR DARWIN—I have just counted the pages of your MS. to see that they are all right, and packed it up to send you by post, registered, so I hope it will reach you safely. I should have sent it yesterday, but people came in and bothered me about post time.

I did not at all mean by what I said to stop you from publishing your views, and I really should not like to take that responsibility. Somebody rummaging among your papers half a century hence will find *Pangenesi*s and say, "See this wonderful anticipation of our modern theories, and that stupid ass Huxley preventing his publishing them." And then the Carlyleans of that day will make me a text for holding forth upon the difference between mere vulpine sharpness and genius.

I am not going to be made a horrid example of in that way. But all I say is, publish your views, not so much in the shape of formed conclusions, as of hypothetical developments of the only clue at present accessible, and don't give the Philistines more chances of blaspheming than you can help.

I am very grieved to hear that you have been so ill again.—Ever yours faithfully,  
T. H. HUXLEY.

26 ABBEY PLACE, *Oct. 2, 1865.*

MY DEAR DARWIN—"This comes hoping you are well," and for no other purpose than to say as much. I am just back from seven weeks' idleness at Littlehampton with my wife and chil-

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\* Of *Pangenesi*s.

dren, the first time I have had a holiday of any extent with them for years.

We are all flourishing—the babies particularly so—and I find myself rather loth to begin grinding at the mill again. There is a vein of laziness in me which crops out uncommonly strong in your godson, who is about the idlest, jolliest young four year old I know.

You will have been as much grieved as I have been about dear old Hooker. According to the last accounts, however, he is mending, and I hope to see him in the pristine vigour again before long.

My wife is gone to bed or she would join me in the kindest regards and remembrances to Mrs. Darwin and your family.—  
Ever yours faithfully,  
T. H. HUXLEY.

The sound judgment and nice sense of honour for which Huxley was known among his friends often led those who were in difficulties to appeal to him for advice. About this time a dispute arose over an alleged case of unacknowledged “conveyance” of information. Writing to Hooker, he says the one party to the quarrel failed to “set the affair straight with half a dozen words of frank explanation as he might have done;” as to the other, “like all quiet and mild men who do get a grievance, he became about twice as ‘wud’ as Berserks like you and me.” Both came to him, so that he says, “I have found it very difficult to deal honestly with both sides without betraying the confidence of either or making matters worse.” Happily, with his help, matters reached a peaceful solution, and his final comment is—

I don't mind fighting to the death in a good big row, but when A and B are supplying themselves from C's orchard, I don't think it is very much worth while to dispute whether B filled his pockets directly from the trees or indirectly helped himself to the contents of A's basket. If B has so helped himself, he certainly ought to say so like a man, but if I were A, I would not much care whether he did or not.

— has been horribly disgusted about it, but I am not sure the discipline may not have opened his eyes to new and useful aspects of nature.

The summer of 1865 saw the inception of an educational experiment—an International Education Society—to which

Huxley gladly gave his support as a step in the right direction. He had long been convinced of the inadequacy of existing forms of education—survivals from the needs of a bygone age—to prepare for the new forms into which intellectual life was passing. That educators should be content to bring up the young generation in the modes of thought which satisfied their forefathers three centuries ago, as if no change had passed over the world since then, filled him with mingled amazement and horror.

The outcome of the scheme was the International College, at Spring Grove, Isleworth, under the headmastership of Dr. Leonhard Schmitz; one of the chief members of the committee being Dr. (afterwards Sir) William Smith, while at the head of the Society was Richard Cobden, under whose presidency it had been registered some time before. John Stuart Mill, however, refused to join, considering that this was not the most needed reform in education, and that he could not support a school in which the ordinary theology was taught.

An article in the *Reader* for June 17, 1865, sketches the plan. The design was to give a liberal education to boys whether intended for a profession or for commerce. The education for both was the same up to a certain point, corresponding to that given in our higher schools, together with foreign languages and the elements of physical and social science, after which the courses bifurcated.\* Special stress was laid on modern languages, both for themselves and as a preparation and help for classical teaching. Accordingly, the International College was one of three parallel institutions in England, France, and Germany, where a boy could in turn acquire a sound knowledge of all three languages while continuing the same course of education. The Franco-Prussian war of 1870, however, proved fatal to the scheme.

Some letters to his friend Dr. W. K. Parker,† show the

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\* For a fuller account of the scientific education see p. 330.

† A man of whom he wrote (preface to Prof. Jeffery Parker's *Life of W. K. Parker*, 1893), that "in him the genius of an artist struggled with that of a philosopher, and not unfrequently the latter got the

good-fellowship which existed between them, as well as the interest he took in the style and success of Parker's work. Parker was hard at work on *Birds*, a subject in which his friend and leader also was deeply interested, and was indeed preparing an important book upon it.

Referring to his candidature for the Royal Society, he writes on February 21, 1865: "With reference to your candidature, I am ready to bring your name forward whenever you like, and to back you with 'all my might, power, amity, and authority,' as Essex did Bacon (you need not serve me as Bacon did Essex afterwards), but my impression has been that you did not wish to come forward this year."

And on November 2, 1866, congratulating him on his "well-earned honour" of the F.R.S.—"Go on and prosper. These are not the things wise men work for; but it is not the less proper of a wise man to take them when they come unsought."

26 ABBEY PLACE, Dec. 3, 1865.

MY DEAR PARKER—I have been so terribly pressed by my work that I have only just been able to finish the reading of your paper.

Very few pieces of work which have fallen in my way come near your account of the Struthious skull in point of clearness and completeness. It is a most admirable essay, and will make an epoch in this kind of inquiry.

I want you, however, to remodel the introduction, and to make some unessential but convenient difference in the arrangement of some of the figures.

Secondly, full as the appendix is of most valuable and interesting matter, I advise you for the present to keep it back.

My reason is that you have done justice neither to yourself nor to your topics, and that if the appendix is printed as it stands, your labour will be in great measure lost.

You start subjects enough for half a dozen papers, and partly from the compression thus resulting, and partly from the

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worst of the contest." He speaks too of his "minute accuracy in observation and boundless memory for details and imagination which absolutely rioted in the scenting out of subtle and often far-fetched analogies."

absence of illustrations, I do not believe there are half a dozen men in Europe who will be able to follow you. Furthermore, though the appendix is relevant enough—every line of it—to those who have dived deep, as you and I have—to any one else it has all the aspects of a string of desultory discussions. *As your father confessor, I forbid the publication of the appendix.* After having had all this trouble with you I am not going to have you waste your powers for want of a little method, so I tell you.

What you are to do is this. You are to rewrite the introduction and to say that the present paper is the first of a series on the structure of the vertebrate skull; that the second will be "On the development of the osseous cranium of the Common Fowl" [and here (if you are good), I will permit you to introduce the episode on cartilage and membrane (illegible)]; the third will be "On the chief modifications of the cranium observed in the Sauropsida."

The fourth, "On the mammalian skull."

The fifth, "On the skull of the Ichthyopsida."

I will give you two years from this time to execute these five memoirs; and then if you have stood good-temperedly the amount of badgering and bullying you will get from me whenever you come dutifully to report progress, you shall be left to your own devices in the third year to publish a paper on "The general structure and theory of the vertebrate skull."

You have a brilliant field before you, and a start such that no one is likely to catch you. Sit deliberately down over against the city, conquer it and make it your own, and don't be wasting powder in knocking down odd bastions with random shells.

I write jestingly, but I really am very much in earnest. Come and have a talk on the matter as soon as you can, for I should send in my report. You will find me in Jermyn Street, Tuesday, Wednesday, or Thursday mornings, Thursday afternoon, but not Tuesday or Wednesday afternoon. Send a line to say when you will come.—Ever yours faithfully,

T. H. HUXLEY.

## CHAPTER XX

1866

BESIDES his Fullerian lectures on Ethnology at the Royal Institution this year, Huxley published in February 1866 a paper in the *Natural History Review*, on the "Prehistoric Remains of Caithness," based upon a quantity of remains found the previous autumn at Keiss. This, and the article on the "Neanderthal Skull" in the *Natural History Review* for 1864, attracted some notice among foreign anthropologists. Dr. H. Welcker writes about them; Dr. A. Ecker wants the "Prehistoric Remains" for his new *Archiv für Anthropologie*; the Société d'Anthropologie de Paris elects him a Foreign Associate.

He was asked by Dr. Fayerer to assist in a great scheme he had proposed to the Asiatic Society,\* to gather men of every tribe from India, the Malayan Peninsula, Persia, Arabia, the Indian Archipelago, etc., for anthropological purposes. It was well received by the Council of the Society and by the Lieutenant-Governor of Bengal; anything Huxley could say in its favour would be of great weight. Would he come out as Dr. Fayerer's guest?

Unable to go to Calcutta, he sent the following letter:—

JERMYN STREET, LONDON, *June 14*, 1866.

MY DEAR FAYERER—I lose no time in replying to your second letter, and my first business is to apologise for not having answered the first, but it reached me in the thick of my lectures, and like a great many other things which ought to have been done I put off replying to a more convenient season. I have

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\* Comp. Chap. XXII. *ad init.* and Appendix I.

been terribly hard worked this year, and thought I was going to break down a few weeks ago but luckily I have pulled through.

I heartily wish that there were the smallest chance of my being able to accept your kind invitation and take part in your great scheme at Calcutta. But it is impossible for me to leave England for more than six weeks or two months, and that only in the autumn, a time of year when I imagine Calcutta is not likely to be the scene of anything but cholera patients.

As to your plan itself, I think it a most grand and useful one if it can be properly carried out. But you do things on so grand a scale in India that I suppose all the practical difficulties which suggest themselves to me may be overcome.

It strikes me that it will not do to be content with a single representative of each tribe. At least four or five will be needed to eliminate the chances of accident, and even then much will depend upon the discretion and judgment of the local agent who makes the suggestion. This difficulty, however, applies chiefly if not solely to physical ethnology. To the philologist the opportunities for comparing dialects and checking pronunciation will be splendid, however [few] the individual speakers of each dialect may be. The most difficult task of all will be to prevent the assembled Savans from massacring the "specimens" at the end of the exhibition for the sake of their skulls and pelves!

I am really afraid that my own virtue might yield if so tempted!

Jesting apart, I heartily wish your plans success, and if there are any more definite ways in which I can help, let me know, and I will do my best. You will want, I should think, a physical and a philological committee to organise schemes: (1) for systematic measuring, weighing, and portraiture, with observation and recording of all physical characters; and (2) for uniform registering of sounds by Roman letters and collection of vocabularies and grammatical forms upon an uniform system.

I should advise you to look into the Museum of the Société d'Anthropologie of Paris, and to put yourself in communication with M. Paul Broca, one of its most active members, who has lately been organising a scheme of general anthropological instructions. But don't have anything to do with the quacks who are at the head of the "Anthropological Society" over here. If they catch scent of what you are about they will certainly want to hook on to you.

Once more I wish I had the chance of being able to visit

your congress. I have been lecturing on Ethnology this year,\* and shall be again this year, and I would give a good deal to be able to look at the complex facts of Indian Ethnology with my own eyes.

But as the sage observed, "what's impossible can't be," and what with short holidays—a wife and seven children—and miles of work in arrear, India is an impossibility for me.

You say nothing about yourself, so I trust you are well and hearty, and all your belongings flourishing.—Ever yours faithfully,  
T. H. HUXLEY.

In paleontology he published this year papers on the "Vertebrate Remains from the Jarrow Colliery, Kilkenny;" on a new "Telerpeton from Elgin," and on some "Dinosaurs from South Africa." The latter, and many more afterwards, were sent over by a young man named Alfred Brown, who had a curious history. A Quaker gentleman came across him when employed in cleaning tools in Cirencester College, found that he was a good Greek and Latin scholar, and got him a tutorship in a clergyman's family at the Cape. He afterwards entered the postal service, and being inspired with a vivid interest in geology, spent all the leave he could obtain from his office on the Orange River in getting fossils from the Stormberg Rocks. These, as often as he could afford to send such weighty packages, he sent to Sir R. Murchison, to whom he had received a letter of introduction from his official superior. Sir Roderick, writing to Huxley, says "that he was proud of his new recruit," to whom he sent not only welcome words of encouragement, but the no less welcome news that the brother of his "discoverer," hearing of the facts from Professor Woodward, offered to defray his expenses so that he could collect regularly.

On April 2 Huxley was in Edinburgh to receive the first academic distinction conferred upon him in Britain. He received the honorary degree of the University in company with Tyndall and Carlyle. It was part of the fitness of things that he should be associated in this honour with his close friend Tyndall; but though he frequently acknowl-

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\* As Fullerian Professor at the Royal Institution.



edged his debt to Carlyle as the teacher who in his youth had inspired him with his undying hatred of shams and humbugs of every kind, and whom he had gratefully come to know in after days, Carlyle did not forgive the publication of *Man's Place in Nature*. Years after, near the end of his life, my father saw him walking slowly and alone down the opposite side of the street, and touched by his solitary appearance, crossed over and spoke to him. The old man looked at him, and merely remarking, "You're Huxley, aren't you? the man that says we are all descended from monkeys," went on his way.

On July 6 he writes to tell Darwin that he has lodged a memorial of his about the fossils at the Gallegos river, which was to be visited by the *Nassau*\* exploring ship, with the hydrographer direct, instead of sending it in to the Lords of the Admiralty, who would only have sent it on to the hydrographer. This letter he heads "Country orders executed with accuracy and despatch."

The following letter to Charles Kingsley explains itself—

JERMYN STREET, *April 12, 1866.*

MY DEAR KINGSLEY—I shall certainly do myself the pleasure of listening to you when you preach at the Royal Institution. I wonder if you are going to take the line of showing up the superstitions of men of science. Their name is legion, and the exploit would be a telling one. I would do it myself only I think I am already sufficiently isolated and unpopular.

However, whatever you are going to do I am sure you will speak honestly and well, and I shall come and be assistant bottle-holder.

I am glad you like the working men's lectures. I suspect they are about the best things of that line that I have done, and I only wish I had had the sense to anticipate the run they have had here and abroad, and I would have revised them properly.

As they stand they are terribly in the rough, from a literary point of view.

No doubt crib-biting, nurse-biting and original sin in general are all strictly reducible from Darwinian principles; but don't by misadventure run against any academical facts.

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\* Chap. XXII.

Some whales have all the cerebral vertebrae free *now*, and every one of them has the full number, seven, whether they are free or fixed. No doubt whales had hind legs once upon a time. If when you come up to town you go to the College of Surgeons, my friend Flower the Conservator (a good man whom you should know), will show you the whalebone whale's thigh bones in the grand skeleton they have recently set up. The legs, to be sure, and the feet are gone, the battle of life having left private Cetacea in the condition of a Chelsea pensioner.—Ever yours faithfully,  
T. H. HUXLEY.

This year the British Association met at Nottingham, and Huxley was president of Section D. In this capacity he invited Professor Haeckel to attend the meeting, but the impending war with Austria prevented any Prussian from leaving his country at the time, though Haeckel managed to come over later.

Huxley did not deliver a regular opening address to the section on the Thursday, but on the Friday made a speech, which was followed by a discussion upon biology and its several branches, especially morphology and its relation to physiology (“the facts concerning form are questions of force, every form is force visible.”) He lamented that the subdivisions of the section had to meet separately as a result of specialisation, the reason for which he found in the want of proper scientific education in schools. And this was the fault of the universities, for just as in the story, “Stick won't beat dog, dog won't bite pig, and so the old woman can't get home,” science would not be taught in the schools until it is recognised by the universities.

This prepared the way for Dean Farrar's paper on science teaching in the public schools. His experience as a master at Harrow made him strongly oppose the existing plan of teaching all boys classical composition whether they were suited for it or no. He wished to exchange a great deal of Latin verse-making for elementary science.

This paper was doubly interesting to Huxley, as coming from a classical master in a public school, and he remarked, “He felt sure that at the present time, the important question for England was not the duration of her coal, but the

due comprehension of the truths of science, and the labours of her scientific men."

On the practical side, however, Mr. J. Payne said the great difficulty was the want of teachers; and suggested that if men of science were really in earnest they would condescend to teach in the schools.

It was to a certain extent in answer to this appeal that Huxley gave his lectures on Physiography in 1869 (see p. 331), and instituted the course of training for science teachers in 1871.

He concluded his work at Nottingham by a lecture to working men.

The following is in reply to Mr. Spencer who had accused himself of losing his temper in an argument—

26 ABBEY PLACE, *Sunday, Nov. 8, 1868.*

MY DEAR SPENCER—YOUR conscience has been treating you with the most extreme and unjust severity.

I recollect you *looked* rather savage at one point in our discussion, but I do assure you that you committed no overt act of ferocity; and if you had, I think I should have fully deserved it for joining in the ferocious onslaught we all made upon you.

What your sins may be in this line to other folk I don't know, but so far as I am concerned I assure you I have often said that I know no one who takes aggravated opposition better than yourself, and that I have not a few times been ashamed of the extent to which I have tried your patience.

So you see that you have, what the Buddhists call a stock of accumulated merit, *envers moi*—and if you should ever feel inclined to "d—n my eyes" you can do so and have a balance left.

Seriously, my old friend, you must not think it necessary to apologise to me about any such matters, but believe me (d—ned or und—d)—Ever yours faithfully,

T. H. HUXLEY.

26 ABBEY PLACE, *Nov. 11, 1866.*

MY DEAR DARWIN—I thank you for the new edition of the *Origin*, and congratulate you on having done with it for a while, so as to be able to go on to that book of a portion of which I had a glimpse years ago. I hear good accounts of your health, in-

deed the last was that you were so rampageous you meant to come to London and have a spree among its dissipations. May that be true.

I am in the thick of my work, and have only had time to glance at your *Historical Sketch*.

What an unmerciful basting you give "our mutual friend." I did not know he had put forward any claim! and even now that I read it black and white, I can hardly believe it.

I am glad to hear from Spencer that you are on the right (that is *my*) side in the Jamaica business. But it is wonderful how people who commonly act together are divided about it.

My wife joins with me in kindest wishes to Mrs. Darwin and yourself—Ever yours faithfully,  
T. H. HUXLEY.

You will receive an elementary physiology book, not for your reading but for Miss Darwin's. Were you not charmed with Haeckel?

The "Jamaica business" here alluded to was Governor Eyre's suppression of a negro rising, in the course of which he had executed, under martial law, a coloured leader and member of the Assembly, named Gordon. The question of his justification in so doing stirred England profoundly. It became the touchstone of ultimate political convictions. Men who had little concern for ordinary politics, came forward to defend a great constitutional principle which they conceived to be endangered. A committee was formed to prosecute Governor Eyre on a charge of murder, in order to vindicate the right of a prisoner to trial by due process of law. Thereupon a counter-committee was organised for the defence of the man who, like Cromwell, judged that the people preferred their real security to forms, and had presumably saved the white population of Jamaica by striking promptly at the focus of rebellion.

The *Pall Mall Gazette* of October 29, 1866, made a would-be smart allusion to the part taken in the affair by Huxley, which evoked, in reply, a calm statement of his reasons for joining the prosecuting committee:—

It is amusing (says the *Pall Mall*) to see how the rival committees, the one for the prosecution and the other for the defence of Mr. Eyre, parade the names of distinguished persons who are

enrolled as subscribers on either side. Mill is set against Carlyle, and to counterbalance the adhesion of the Laureate to the Defence Fund, the *Star* hastens to announce that Sir Charles Lyell and Professor Huxley have given their support to the Jamaica Committee. Everything, of course, depends on the ground on which the subscriptions are given. One can readily conceive that Mr. Tennyson has been chiefly moved by a generous indignation at the vindictive behaviour of the Jamaica Committee. It would be curious also to know how far Sir Charles Lyell's and Mr. Huxley's peculiar views on the development of species have influenced them in bestowing on the negro that sympathetic recognition which they are willing to extend even to the ape as "a man and a brother."

The reply appeared in the *Pall Mall* of October 31:—

SIR—I learn from yesterday evening's *Pall Mall Gazette* that you are curious to know whether certain "peculiar views on the development of species," which I am said to hold in the excellent company of Sir Charles Lyell, have led me to become a member of the Jamaica Committee.

Permit me without delay to satisfy a curiosity which does me honour. I have been induced to join that committee neither by my "peculiar views on the development of species," nor by any particular love for, or admiration of the negro—still less by any miserable desire to wreak vengeance for recent error upon a man whose early career I have often admired; but because the course which the committee proposes to take appears to me to be the only one by which a question of the profoundest practical importance can be answered. That question is, Does the killing a man in the way Mr. Gordon was killed constitute murder in the eye of the law, or does it not?

You perceive that this question is wholly independent of two others which are persistently confused with it, namely—was Mr. Gordon a Jamaica Hampden or was he a psalm-singing fire-brand? and was Mr. Eyre actuated by the highest and noblest motives, or was he under the influence of panic-stricken rashness or worse impulses?

I do not presume to speak with authority on a legal question; but, unless I am misinformed, English law does not permit good persons, as such, to strangle bad persons, as such. On the contrary, I understand that, if the most virtuous of Britons, let his place and authority be what they may, seize and hang up the greatest scoundrel in Her Majesty's dominions simply because

he is an evil and troublesome person, an English court of justice will certainly find that virtuous person guilty of murder. Nor will the verdict be affected by any evidence that the defendant acted from the best of motives, and, on the whole, did the State a service.

Now, it *may* be that Mr. Eyre was actuated by the best of motives; it *may* be that Jamaica is all the better for being rid of Mr. Gordon; but nevertheless the Royal Commissioners, who were appointed to inquire into Mr. Gordon's case, among other matters, have declared that:—

The evidence, oral and documentary, appears to us to be wholly insufficient to establish the charge upon which the prisoner took his trial. (*Report*, p. 37.)

And again that they

Cannot see in the evidence which has been adduced, any sufficient proof, either of his (Mr. Gordon's) complicity in the outbreak at Morant Bay, or of his having been a party to any general conspiracy against the Government. (*Report*, p. 38.)

Unless the Royal Commissioners have greatly erred, therefore, the killing of Mr. Gordon can only be defended on the ground that he was a bad and troublesome man; in short, that although he might not be guilty, it served him right.

I entertain so deeply-rooted an objection to this method of killing people—the act itself appears to me to be so frightful a precedent, that I desire to see it stigmatised by the highest authority as a crime. And I have joined the committee which proposes to indict Mr. Eyre, in the hope that I may hear a court of justice declare that the only defence which can be set up (if the Royal Commissioners are right) is no defence, and that the killing of Mr. Gordon was the greatest offence known to the law—murder.—I remain, Sir, your obedient servant,

THOMAS H. HUXLEY.

THE ATHENÆUM CLUB, *Oct.* 30, 1866.

Two letters to friends who had taken the opposite side in this burning question show how resolutely he set himself against permitting a difference on matters of principle to affect personal relations with his warmest opponents.

JERMYN STREET, *Nov.* 8, 1866.

MY DEAR KINGSLEY—The letter of which you have heard, containing my reasons for becoming a member of the Jamaica

Committee was addressed to the *Pall Mall Gazette* in reply to some editorial speculations as to my reasons for so doing.

I forget the date of the number in which my letter appeared, but I will find it out and send you a copy of the paper.

Mr. Eyre's personality in this matter is nothing to me; I know nothing about him, and, if he is a friend of yours, I am very sorry to be obliged to join in a movement which must be excessively unpleasant to him.

Furthermore, when the verdict of the jury which will try him is once given, all hostility towards him on my part will cease. So far from wishing to see him vindictively punished, I would much rather, if it were practicable, indict his official hat and his coat than himself.

I desire to see Mr. Eyre indicted and a verdict of guilty in a criminal court obtained, because I have, from its commencement, carefully watched the Gordon case; and because a new study of all the evidence which has now been collected has confirmed my first conviction that Gordon's execution was as bad a specimen as we have had since Jeffries' time of political murder.

Don't suppose that I have any particular admiration for Gordon. He belongs to a sufficiently poor type of small political agitator—and very likely was a great nuisance to the Governor and other respectable persons.

But that is no reason why he should be condemned, by an absurd tribunal and with a brutal mockery of the forms of justice, for offences with which impartial judges, after a full investigation, declare there is no evidence to show that he was connected.

Ex-Governor Eyre seized the man, put him in the hands of the preposterous subalterns, who pretended to try him—saw the evidence and approved of the sentence. He is as much responsible for Gordon's death as if he had shot him through the head with his own hand. I daresay he did all this with the best of motives, and in a heroic vein. But if English law will not declare that heroes have no more right to kill people in this fashion than other folk, I shall take an early opportunity of migrating to Texas or some other quiet place where there is less hero-worship and more respect for justice, which is to my mind of much more importance than hero-worship.

In point of fact, men take sides on this question, not so much by looking at the mere facts of the case, but rather as their deepest political convictions lead them. And the great use of the prosecution, and one of my reasons for joining it, is that

it will help a great many people to find out what their profoundest political beliefs are.

The hero-worshippers who believe that the world is to be governed by its great men, who are to lead the little ones, justly if they can; but if not, unjustly drive or kick them the right way, will sympathise with Mr. Eyre.

The other sect (to which I belong) who look upon hero-worship as no better than any other idolatry, and upon the attitude of mind of the hero-worshipper as essentially immoral; who think it is better for a man to go wrong in freedom than to go right in chains; who look upon the observance of inflexible justice as between man and man as of far greater importance than even the preservation of social order, will believe that Mr. Eyre has committed one of the greatest crimes of which a person in authority can be guilty, and will strain every nerve to obtain a declaration that their belief is in accordance with the law of England.

People who differ on fundamentals are not likely to convert one another. To you, as to my dear friend Tyndall, with whom I almost always act, but who in this matter is as much opposed to me as you are, I can only say, let us be strong enough and wise enough to fight the question out as a matter of principle and without bitterness.—Ever yours faithfully,

T. H. HUXLEY.

*November 9, 1866.*

MY DEAR TYNDALL—Many thanks for the kind note which accompanied your letter to the Jamaica Committee.

When I presented myself at Rogers' dinner last night I had not heard of the latter, and Gassiot began poking fun at me, and declaring that your absence was due to a quarrel between us on this unhappy subject.

I replied to the jest earnestly enough, that I hoped and believed our old friendship was strong enough to stand any strain that might be put on it, much as I grieved that we should be ranged in opposite camps in this or any other cause.

That you and I have fundamentally different political principles must, I think, have become obvious to both of us during the progress of the American War. The fact is made still more plain by your printed letter, the tone and spirit of which I greatly admired without being able to recognise in it any important fact or argument which had not passed through my mind before I joined the Jamaica Committee.



Thus there is nothing for it but for us to agree to differ, each supporting his own side to the best of his ability, and respecting his friend's freedom as he would his own, and doing his best to remove all petty bitterness from that which is at bottom one of the most important constitutional battles in which Englishmen have for many years been engaged.

If you and I are strong enough and wise enough, we shall be able to do this, and yet preserve that love for one another which I value as one of the good things of my life.

If not, we shall come to grief. I mean to do my best.—  
Ever yours faithfully, T. H. HUXLEY.

Huxley was always of opinion that to write a good elementary text-book required a most extensive and intimate knowledge of the subject under discussion. Certainly the *Lessons on Elementary Physiology* which appeared at the end of 1866 were the outcome of such knowledge, and met with a wonderful and lasting success as a text-book. A graceful compliment was passed upon it by Sir William Lawrence, when, in thanking the author for the gift of the book, he wrote (January 24, 1867), "in your modest book 'indocti discant, ament meminisse periti!'"

This was before the days of American copyright, and English books were usually regarded as fair prey by the mass of American publishers. Among the exceptions to this practical rule were the firm of D. Appleton & Co., who made it a point of honour to treat foreign authors as though they were legally entitled to some equitable rights. On their behalf an arrangement was made for an authorised American edition of the *Physiology* by Dr. Youmans, whose acquaintance thus made my father did not allow to drop.

It is worth noting that by the year 1898 this little book had passed through four editions, and been reprinted thirty-one times.

## CHAPTER XXI

1867

It has already been noted that Huxley's ethnological work continued this year with a second series of lectures at the Royal Institution, while he enlarged his paper on "Two widely contrasted forms of Human Crania," and published it in the *Journal of Anatomy*. One paleontological memoir of his appeared this year on *Acanthopholis*, a fossil from the chalk marl, an additional piece of work for which he excuses himself to Sir C. Lyell (January 4, 1867):—

The new reptile advertised in *Geol. Mag.* has turned up in the way of business, and I could not help giving a notice of it, or I should not have undertaken anything fresh just now.

The Spitzbergen things are very different, and I have taken sundry looks at them and put them by again to let my thoughts ripen.

They are Ichthyosaurian, and I am not sure they do not belong to two species. But it is an awful business to compare all the Ichthyosaurians. I *think* that one form is new. Please to tell Nordenskiöld this much.

However, his chief interest was in the anatomy of birds, at which he had been working for some time, and especially the development of certain of the cranial bones as a basis of classification. On April 11, expanding one of his Hunterian Lectures, he read a paper on this subject at the Zoological Society, afterwards published in their *Proceedings* for 1867.

As he had found the works of Professor Cornay of help in the preparation of this paper, he was careful to send him a copy with an acknowledgment of his indebtedness, elicit-

ing the reply, “ *c'est si beau de trouver chez l'homme la science unie à la justice.*”

He followed this up with another paper on “ The Classification and Distribution of the Alektoromorphae and Heteromorphae ” in 1868, and to the work upon this the following letter to his ally, W. K. Parker, refers :—

ROYAL GEOLOG. SURVEY OF GT. BRITAIN,  
JERMYN STREET, July 17, 1867.

MY DEAR PARKER—Nothing short of the direct temptation of the evil one could lead you to entertain so monstrous a doctrine, as that you propound about *Cariamidae*.

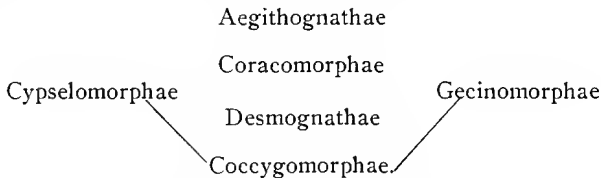
I recommend fasting for three days and the application of a scourge thrice in the twenty-four hours! Do this, and about the fourth day you will perceive that the cranial differences alone are as great as those between *Cathartes* and *Serpentarius*.

If you want to hear something new and true it is this :—

1. That *Memora* is more unlike all the other Passerines (*i.e.* Coracomorphae) than they are unlike one another, and that it will have to stand in a group by itself.

It is as much like a wren as you are—less so, in fact, if you go on maintaining that preposterous fiction about *Serpentarius*.

2. Wood-peckers are more like crows than they are like cuckoos.



3. Sundevell is the sharpest fellow who has written on the classification of birds.

4. Nitzsch and W. K. Parker \* are the sharpest fellows who have written on their osteology.

5. Though I do not see how it follows naturally on the above, still, where can I see a good skeleton of *Glareola*?

None in collège, B.M.S. badly prepared.—Ever yours faithfully,  
T. H. HUXLEY.

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\* Except in the case of *Serpentarius*.

An incident which diversified one of the Gilchrist lectures to working men is thus recorded by the *Times* of January 23, 1867:—

A GOOD EXAMPLE. Last night, at the termination of a lecture on ethnology, delivered by Professor Huxley to an audience which filled the theatre of the London Mechanics' Institute in Southampton Buildings, Chancery Lane, the lecturer said that he had received a letter as he entered the building which he would not take the responsibility of declining to read, although it had no reference to the subject under consideration. He then read the letter, which was simply signed "A Regular Attendant at Your Lectures," and which in a few words drew attention to the appalling distress existing among the population out of work at the East End, and suggested that all those present at the lecture that night should be allowed the opportunity of contributing 1d. or 2d. each towards a fund for their relief, and that the professor should become the treasurer for the evening. This suggestion was received by the audience with marks of approval. The professor said he would not put pressure on anyone; he would simply place his own subscription in one of the skulls on the table. This he did, and all the audience coming on the platform, threw in money in copper and silver until the novel cash box was filled with coin which amounted to a large sum. A gentleman present expressed a hope that the example set by that audience might be followed with good results wherever large bodies assembled either for educational or recreative purposes.

At the end of April this year my father spent a week in Brittany with Dr. Hooker and Sir J. Lubbock, rambling about the neighbourhood of Rennes and Vannes, and combining the examination of prehistoric remains with the refreshment of holiday making.

Few letters of this period exist. The *x* Club was doing its work. Most of those to whom he would naturally have written he met constantly. Two letters to Professor Haeckel give pieces of his experience. One suggests the limits of aggressive polemics, as to which I remember his once saying that he himself had only twice been the aggressor in controversy, without waiting to be personally attacked; once where he found his opponent was engaged

in a flanking movement; the other when a man of great public reputation had come forward to champion an untenable position of the older orthodoxy, and a blow dealt to his pretensions to historical and scientific accuracy would not only bring the question home to many who neglected it in an impersonal form, but would also react upon the value of the historical arguments with which he sought to stir public opinion in other spheres. The other letter touches on the influence, at once calming and invigorating, as he had known it to the full for the last twelve years, which a wife can bring in the midst of outward struggles to the inner life of the home.

JERMYN STREET, LONDON, *May* 20, 1867.

MY DEAR HAECKEL—Your letter, though dated the 12th, has but just reached me. I mention this lest you should think me remiss, my sin in not writing to you already being sufficiently great. But your book did not reach me until November, and I have been hard at work lecturing, with scarcely an intermission ever since.

Now I need hardly say that the *Morphologie* is not exactly a novel to be taken up and read in the intervals of business. On the contrary, though profoundly interesting, it is an uncommonly hard book, and one wants to read every sentence of it over.

I went through it within a fortnight of its coming into my hands, so as to get at your general drift and purpose, but up to this time I have not been able to read it as I feel I ought to read it before venturing upon criticism. You cannot imagine how my time is frittered away in these accursed lectures and examinations.

There can be but one opinion, however, as to the knowledge and intellectual grasp displayed in the book; and, to me, the attempt to systematise biology as a whole is especially interesting and valuable.

I shall go over this part of your work with great care by and by, but I am afraid you must expect that the number of biologists who will do so, will remain exceedingly small. Our comrades are not strong in logic and philosophy.

With respect to the polemic *excursus*, of course, I chuckle over them most sympathetically, and then say how naughty they are! I have done too much of the same sort of thing not to

sympathise entirely with you; and I am much inclined to think that it is a good thing for a man, once at any rate in his life, to perform a public war-dance against all sorts of humbug and imposture.

But having satisfied one's love of freedom in this way, perhaps the sooner the war-paint is off the better. It has no virtue except as a sign of one's own frame of mind and determination, and when that is once known, is little better than a distraction.

I think there are a few patches of this kind, my dear friend, which may as well come out in the next edition, *e.g.* that wonderful note about the relation of God to gas, the gravity of which greatly tickled my fancy.

I pictured to myself the effect which a translation of this would have upon the minds of my respectable countrymen!

*Apropos* of translation. Darwin wrote to me on that subject, and with his usual generosity, would have made a considerable contribution towards the expense if we could have seen our way to the publication of a translation. But I do not think it would be well to translate the book in fragments, and, as a whole, it would be a very costly undertaking, with very little chance of finding readers.

I do not believe that in the British Islands there are fifty people who are competent to read the book, and of the fifty, five and twenty have read it or will read it in German.

What I desire to do is to write a review of it, which will bring it into some notice on this side of the water, and this I hope to do before long. If I do not it will be, you well know, from no want of inclination, but simply from lack of time.

In any case, as soon as I have been able to study the book carefully, you shall have my honest opinion about all points.

I am glad your journey has yielded so good a scientific harvest, and especially that you found my *Oceanic Hydrozoa* of some use. But I am shocked to find you had no copy of the book of your own, and I shall take care that one is sent to you. It is my first-born work, done when I was very raw and inexperienced, and had neither friends nor help. Perhaps I am all the fonder of the child on that ground.

A lively memory of you remains in my house, and wife and children will be very glad to hear that I have news of you when I go home to dinner.

Keep us in kindly recollection, and believe me—Ever yours  
very faithfully,

T. H. HUXLEY.

*July 16, 1867.*

MY DEAR HAECKEL — My wife and I send you our most hearty congratulations and good wishes. Give your betrothed a good account of us, for we hope in the future to entertain as warm a friendship for her as for you. I was very glad to have the news, for it seemed to me very sad that a man of your warm affections should be surrounded only by hopeless regrets. Such surroundings inflict a sort of partial paralysis upon one's whole nature, a result which is, to me, far more serious and regrettable than the mere suffering one undergoes.

The one thing for men, who like you and I stand pretty much alone, and have a good deal of fighting to do in the external world, is to have light and warmth and confidence within the four walls of home. May all these good things await you!

Many thanks for your kind invitation to Jena. I am sure my wife would be as much pleased as I to accept it, but it is very difficult for her to leave her children.

We will keep it before us as a pleasant possibility, but I suspect you and Madame will be able to come to England before we shall reach Germany.

I wish I had rooms to offer you, but you have seen that troop of children, and they leave no corner unoccupied.

Many thanks for the Bericht and the genealogical tables. You seem, as usual, to have got through an immense amount of work.

I have been exceedingly occupied with a paper on the "Classification of Birds," a sort of expansion of one of my Hunterian Lectures this year. It has now gone to press, and I hope soon to be able to send you a copy of it.

Occupation of this and other kinds must be my excuse for having allowed so much longer a time to slip by than I imagined had done before writing to you. It is not for want of sympathy, be sure, for my wife and I have often talked of the new life opening out to you.

This is written in my best hand. I am proud of it, as I can read every word quite easily myself, which is more than I can always say for my own MS.—Ever yours faithfully,

T. H. HUXLEY.

The same experience is attested and enforced in the correspondence with Dr. Anton Dohrn, which begins this year. Genial, enthusiastic, as pungent as he was eager in conversation, the future founder of the Marine Biological

Station at Naples, on his first visit to England, made my father's acquaintance by accepting his invitation to stay with him "for as long as you can make it convenient to stay" at Swanage, "a little country town with no sort of amusement except what is to be got by walking about a rather pretty country. But having warned you of this, I repeat that it will give me much pleasure to see you if you think it worth while to come so far."

Dr. Dohrn came, and came into the midst of the family—seven children, ranging from ten years to babyhood, with whom he made himself as popular by his farmyard repertory, as he did with the elders by other qualities. The impression left upon him appears from a letter written soon after—

"Ich habe heute mehrere Capitel in Mill's *Utilitarianism* gelesen und das Wort happiness mehr als einmal gefunden: hätte *ich* eine Definition dieses vielumworbenen Wortes irgend Jemand zu geben, ich würde sagen: \* go and see the Huxley family at Swanage; and if you would enjoy the same I enjoyed, you would feel what is happiness, and never more ask for a definition of this sentiment."

SWANAGE, *Sept. 22, 1867.*

MY DEAR DOHRN—Thanks to my acquaintance with the *Mikroskopische Anatomie*, and to the fact that you employ our manuscript characters, and not the hieroglyphics of what I venture to call the "cursed" and not "cursiv" Schrift, your letter was as easy as it was pleasant to read. We are all glad to have news of you, though it was really very unnecessary to thank us for trying to make your brief visit a pleasant one. Your conscience must be more "pungent" than your talk, if it pricks you with so little cause. My wife rejoices saucily to find that phrase of hers has stuck so strongly in your mind, but you must remember her fondness for "Tusch."

You must certainly marry. In my bachelor days, it was unsafe for anyone to approach me before mid-day, and for all intellectual purposes I was barren till the evening. Breakfast at six would have upset me for the day. You and the lobster noted the difference the other day.

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\* I have been reading several chapters of Mill's *Utilitarianism* to-day, and met with the word "happiness" more than once; if I had to give anybody a definition of this much debated word, I should say—



Whether it is matrimony or whether it is middle age I don't know, but as time goes on you can combine both.

I cannot but accept your kind offer to send me Fanny Lewald's works, though it is a shame to rob you of them. In return my wife insists on your studying a copy of Tennyson, which we shall send you as soon as we return to civilisation, which will be next Friday. If you are in London after that date we shall hope to see you once more before you return to the bosom of the "Fatherland."

I did my best to give the children your message, but I fear I failed ignominiously in giving the proper bovine vocalisation to "Mroo."

That small curly-headed boy Harry, struck, I suppose by the kindness you both show to children, has effected a synthesis between you and Tyndall, and gravely observed the other day, "Doctor Dohrn-Tyndall do say Mroo."

My wife . . . sends her kind regards. The "seven" are not here or they would vote love by acclamation.—Ever yours very faithfully,  
T. H. HUXLEY.

He did not this year attend the British Association, which was held in Dundee. This was the first occasion on which an evening was devoted to a working men's lecture, a step important as tending towards his own ideal of what science should be:—not the province of the few, but the possession of the many.

This first lecture was delivered by Professor Tyndall, who wrote him an account of the meeting, and in particular of his reconciliation with Professors Thomson (Lord Kelvin) and Tait, with whom he had had a somewhat embittered controversy.

In his reply, Huxley writes:—

TO J. TYNDALL

Thanks also for a copy of the *Dundee Advertiser* containing your lecture. It seemed to me that the report must be a very good one, and the lecture reads exceedingly well. You have inaugurated the working men's lectures of the Association in a way that cannot be improved. And it was worth the trouble, for I suspect they will become a great and noble feature in the meetings.

Everything seems to have gone well at the meeting, the educational business carried [*i.e.* a recommendation that natural science be made a part of the curriculum in the public schools], and the anthropologists making fools of themselves in a most effectual way. So that I do not feel I have anything to reproach myself with for being absent.

I am very pleased to hear of the reconciliation with Thomson and Tait. The mode of it speaks well for them, and the fact will remove a certain source of friction from amongst the cogs of your mental machinery.

The following gives the reason for his resigning the Fullerian lectureship:—

ATHENÆUM CLUB, *May*, 1867.

MY DEAR TYNDALL—A conversation I had with Bence Jones yesterday reminded me that I ought to have communicated with you. But we do not meet so often as we used to do, being, I suppose, both very busy, and I forget to write.

You recollect that the last time we talked together, you mentioned a notion of Bence Jones's to make the Fullerian Professorship of Physiology a practically permanent appointment, and that I was quite inclined to stick by that (if such arrangement could be carried out), and give up other things.

But since I have been engaged in the present course of lectures I have found reason to change my views. It is very hard work, and takes up every atom of my time to make the lectures what they should be; and I find that at this time of year, being more or less used up, I suppose, with the winter work, I stand the worry and excitement of the actual lectures very badly. Add to this that it is six weeks clean gone out of the only time I have disposable for real scientific progress, and you will understand how it is that I have made up my mind to resign.

I put all this clearly before Bence Jones yesterday, with the proviso that I could and would do nothing that should embarrass the Institution or himself.

If there is the least difficulty in supplying my place, or if the managers think I shall deal shadily with them by resigning before the expiration of my term, of course I go on. And I hope you all understand that I would do anything rather than put even the appearance of a slight upon those who were kind enough to elect me.—Ever yours,

T. H. HUXLEY.

He found a substitute for 1868, the last year of the triennial course, in Dr. (now Sir) Michael Foster. Of his final lectures in 1867 he used to tell a story against himself.

In my early period as a lecturer, I had very little confidence in my general powers, but one thing I prided myself upon was clearness. I was once talking of the brain before a large mixed audience, and soon began to feel that no one in the room understood me. Finally I saw the thoroughly interested face of a woman auditor, and took consolation in delivering the remainder of the lecture directly to her. At the close, my feeling as to her interest was confirmed when she came up and asked if she might put one question upon a single point which she had not quite understood. "Certainly," I replied. "Now, Professor," she said, "is the cerebellum inside or outside the skull?" (*Reminiscences of T. H. Huxley*, by Professor H. Fairfield Osborn).

Dr. Foster used to add maliciously, that disgust at the small impression he seemed to have made was the true reason for the transference of the lectures.

## CHAPTER XXII

1868

IN 1868 he published five scientific memoirs, amongst them his classification of birds and "Remarks upon *Archæopteryx Lithographica*" (*Proc. Roy. Soc.* xvi. 1868, pp. 243-248). This creature, a bird with reptilian characters, was a suggestive object from which to popularise some of the far-reaching results of his many years' labour upon the morphology of both birds and reptiles. Thus it led to a lecture at the Royal Institution, on February 7, "On the Animals which are most nearly intermediate between Birds and Reptiles."

Of this branch of work Sir M. Foster says: (Obit. Not. *Proc. Roy. Soc.* vol. lix.):—

One great consequence of these researches was that science was enriched by a clear demonstration of the many and close affinities between reptiles and birds, so that the two henceforward came to be known under the joint title of Sauropsida, the amphibia being at the same time distinctly more separated from the reptiles, and their relations to fishes more clearly signified by the joint title of Ichthyopsida. At the same time, proof was brought forward that the line of descent of the Sauropsida clearly diverged from that of the Mammalia, both starting from some common ancestry. And besides this great generalisation, the importance of which, both from a classificatory and from an evolutionary point of view, needs no comment, there came out of the same researches numerous lesser contributions to the advancement of morphological knowledge, including among others an attempt, in many respects successful, at a classification of birds.

This work in connection with the reptilian ancestry of birds further appears in the paleontological papers published

in 1869 upon the Dinosaurs (see Chap. XXIII.), and is referred to in a letter to Haeckel, p. 325.

His Hunterian lectures on the Invertebrata appeared this year in the *Quarterly Journal of Microscopical Science* (pp. 126–129, and 191–201), and in the October number of the same journal appeared his famous article "On some Organisms living at great depth in the North Atlantic Ocean," originally delivered before the British Association at Norwich in this year (1868). The sticky or viscid character of the fresh mud from the bottom of the Atlantic had already been noticed by Captain Dayman when making soundings for the Atlantic cable. This stickiness was apparently due to the presence of innumerable lumps of a transparent, gelatinous substance, consisting of minute granules without discoverable nucleus or membranous envelope, and interspersed with cretaceous coccoliths. After a description of the structure of this substance and its chemical reactions, he makes a careful proviso against confounding the statement of fact in the description and the interpretation which he proceeds to put upon these facts:—

I conceive that the granulate heaps and the transparent gelatinous matter in which they are embedded represent masses of protoplasm. Take away the cysts which characterise the *Radiolaria*, and a dead *Sphaerosoum* would very nearly represent one of this deep-sea "Ur-schleim," which must, I think, be regarded as a new form of those simple animated beings which have recently been so well described by Haeckel in his *Mono-graphie der Moneras*, p. 210.\*

Of this he writes to Haeckel on October 6, 1868:—

[This paper] is about a new "Moner" which lies at the bottom of the Atlantic to all appearances, and gives rise to some wonderful calcified bodies. I have christened it *Bathybius Haeckelii*, and I hope that you will not be ashamed of your god-child. I will send you some of the mud with the paper.

The explanation was plausible enough on general grounds, if the evidence had been all that it seemed to be.

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\* See *Coll. Ess.* v. 153.

But it must be noted that the specimens examined by him and by Haeckel, who two years later published a full and detailed description of *Bathybius*, were seen in a preserved state. Neither of them saw a fresh specimen, though on the cruise of the *Porcupine*, Sir Wyville Thomson and Dr. W. Carpenter examined the substance in a fresh state, and found no better explanation to give of it. However, not only were the expectations that it was very widely distributed over the Atlantic bottom, falsified in 1879 by the researches of the *Challenger* expedition, but the behaviour of certain deep-sea specimens gave good ground for suspecting that what had been sent home before as genuine deep-sea mud, was a precipitate due to the action on the specimens of the spirit in which they were preserved. Though Haeckel, with his special experience of *Monera*, refused to desert *Bathybius*, a close parallel to which was found off Greenland in 1876, the rest of its sponsors gave it up. Whatever it might be as a matter of possibility, the particular evidence upon which it had been described was tainted. Once assured of this, Huxley characteristically took the bull by the horns. Without waiting for any one else to come forward, he made public renunciation of *Bathybius* at the British Association in 1879.\* The "eating of the leek" as recommended to his friend Dohrn (July 7, 1868), was not merely a counsel for others, but was a prescription followed by himself on occasion:—

"As you know, I did not think you were on the right track with the Arthropoda, and I am not going to profess to be sorry that you have finally worked yourself to that conclusion.

As to the unlucky publication in the *Journal of Anatomy and Physiology*, you have read your Shakespeare and know what is meant by "eating a leek." Well, every honest man has to do that now and then, and I assure you that if eaten fairly and without grimaces, the devouring of that herb has a very wholesome cooling effect on the blood, particularly in people of sanguine temperament.

Seriously you must not mind a check of this kind.

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\* See vol. ii. p. 5, *sq.*

This incident, one may suspect, was in his mind when he wrote in his *Autobiography* of the rapidity of thought characteristic of his mother:—

That characteristic has been passed on to me in full strength; it has often stood me in good stead, it has sometimes played me sad tricks, and it has always been a danger.

At the Norwich meeting of the Association he also delivered his well-known lecture to working men "On a Piece of Chalk," a perfect example of the handling of a common and trivial subject, so as to make it "a window into the Infinite." He was particularly interested in the success of the meeting, as his friend Hooker was President, and writes to Darwin, September 12:—

We had a capital meeting at Norwich, and dear old Hooker came out in great force as he always does in emergencies.

The only fault was the terrible "Darwinismus" which spread over the section and crept out when you least expected it, even in Fergusson's lecture on "Buddhist Temples."

You will have the rare happiness to see your ideas triumphant during your lifetime.

*P.S.*—I am preparing to go into opposition; I can't stand it.

This lecture "On a Piece of Chalk," together with two others delivered this year, seem to me to mark the maturing of his style into that mastery of clear expression for which he deliberately laboured, the saying exactly what he meant, neither too much nor too little, without confusion and without obscurity. Have something to say, and say it, was the Duke of Wellington's theory of style; Huxley's was to say that which has to be said in such language that you can stand cross-examination on each word. Be clear, though you may be convicted of error. If you are clearly wrong, you will run up against a fact some time and get set right. If you shuffle with your subject, and study chiefly to use language which will give a loophole of escape either way, there is no hope for you.

This was the secret of his lucidity. In no one could Buffon's aphorism on style find a better illustration, *Le style c'est l'homme même*. In him science and literature, too often

divorced, were closely united; and literature owes him a debt for importing into it so much of the highest scientific habit of mind; for showing that truthfulness need not be bald, and that real power lies more in exact accuracy than in luxuriance of diction. Years after, no less an authority than Spedding, in a letter upon the influence of Bacon on his own style in the matter of exactitude, the pruning of fine epithets and sweeping statements, the reduction of numberless superlatives to positives, asserted that, if as a young man he had fallen in with Huxley's writings before Bacon's, they would have produced the same effect upon him.\*

Of the other two discourses referred to, one is the opening address which he delivered as Principal at the South London Working Men's College on January 4, "A Liberal Education, and Where to Find It." This is not a brief for science to the exclusion of other teaching; no essay has insisted more strenuously on the evils of a one-sided education, whether it be classical or scientific; but it urged the necessity for a strong tincture of science and her method, if the modern conception of the world, created by the spread of natural knowledge, is to be fairly understood. If culture is the "criticism of life," it is fallacious if deprived of knowledge of the most important factor which has transformed the medieval into the modern spirit.

Two of his most striking passages are to be found in this address; one the simile of the force behind nature as the hidden chess player; the other the noble description of the end of a true education.

Well known as it is, I venture to quote the latter as an instance of his style:—

That man, I think, has had a liberal education, who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that as a mechanism it is capable of; whose intellect is a clear cold logic engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine, to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great

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\* See p. 520.



and fundamental truths of nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of nature or of art, to hate all vileness, and to respect others as himself.

Such an one and no other, I conceive, has had a liberal education, for he is, as completely as a man can be, in harmony with nature. He will make the best of her, and she of him. They will get on together rarely; she as his ever-beneficent mother; he as her mouth-piece, her conscious self, her minister and interpreter.

The third of these discourses is the address "On the Physical Basis of Life," of which he writes to Haeckel on January 20, 1869:—

You will be amused to hear that I went to the holy city, Edinburgh itself, the other day, for the purpose of giving the first of a series of Sunday lectures. I came back without being stoned; but Murchison (who is a Scotchman you know), told me he thought it was the boldest act of my life. The lecture will be published in February, and I shall send it to you, as it contains a criticism of materialism which I should like you to consider.

In it he explains in popular form a striking generalisation of scientific research, namely, that whether in animals or plants, the structural unit of the living body is made up of similar material, and that vital action and even thought are ultimately based upon molecular changes in this life-stuff. Materialism! gross and brutal materialism! was the mildest comment he expected in some quarters; and he took the opportunity to explain how he held "this union of materialistic terminology with the repudiation of materialistic philosophy," considering the latter "to involve grave philosophic error."

His expectations were fully justified; in fact, he writes that some persons seemed to imagine that he had invented protoplasm for the purposes of the lecture.

Here, too, in the course of a reply to Archbishop Thompson's confusion of the spirit of modern thought with

the system of M. Comte, he launched his well-known definition of Comtism as Catholicism *minus* Christianity, which involved him in a short controversy with Mr. Congreve (see "The Scientific Aspects of Positivism," *Lay Sermons*, p. 162), and with another leading Positivist, who sent him a letter through Mr. Darwin. Huxley replied:—

JERMYN STREET, *March 11, 1869.*

MY DEAR DARWIN—I know quite enough of Mr. — to have paid every attention to what he has to say, even if you had not been his ambassador.

I glanced over his letter when I returned home last night very tired with my two nights' chairmanship at the Ethnological and the Geological Societies.

Most of it is fair enough, though I must say not helping me to any novel considerations.

Two paragraphs, however, contained opinions which Mr. — is at perfect liberty to entertain, but not, I think, to express to me.

The one is, that I shaped what I had to say at Edinburgh with a view of stirring up the prejudices of the Scotch Presbyterians (imagine how many Presbyterians I had in my audiences!) against Comte.

The other is the concluding paragraph, in which Mr. — recommends me to "*read Comte*," clearly implying that I have criticised Comte without reading him.

You will know how far I am likely to have committed either of the immoralities thus laid to my charge.

At any rate, I do not think I care to enter into more direct relations with anyone who so heedlessly and unjustifiably assumes me to be guilty of them. Therefore I shall content myself with acknowledging the receipt of Mr. —'s letter through you.—Ever yours faithfully,  
T. H. HUXLEY.

JERMYN STREET, *March 17, 1869.*

MY DEAR DARWIN—After I had sent my letter to you the other day I thought how stupid I had been not to put in a slip of paper to say it was meant for —'s edification.

I made sure you would understand that I wished it to be sent on, and wrote it (standing on the points of my toes and with my tail up very stiff) with that end in view.

[Sketch of two dogs bristling up.]

I am getting so weary of people writing to propose con-

troversy to me upon one point or another, that I begin to wish the article had never been written. The fighting in itself is not particularly objectionable, but it's the waste of time.

I begin to understand your sufferings over the *Origin*. A good book is comparable to a piece of meat, and fools are as flies who swarm to it, each for the purpose of depositing and hatching his own particular maggot of an idea.—Ever yours,

T. H. HUXLEY.

A little later he wrote to Charles Kingsley, who had supported him in the controversy:—

JERMYN STREET, *April 12, 1869.*

MY DEAR KINGSLEY—Thanks for your hearty bottle-holding.

Congreve is no better than a donkey to take the line he does. I studied Comte, *Philosophic, Politique*, and all sixteen years ago, and having formed my judgment about him, put it into one of the pigeon holes of my brain (about the H.\* minor), and there let it rest till it was wanted.

You are perfectly right in saying that Comte knew nothing about physical science—it is one of the points I am going to put in evidence.

The law of the three states is mainly evolved from his own consciousness, and is only a bad way of expressing that tendency to personification which is inherent in man.

The Classification of Sciences is bosh—as Spencer has already shown.

Nothing short of madness, however, can have dictated Congreve's challenge of my admiration of Comte as a man at the end of his article. Did you ever read Littré's *Life of Comte*? I bought it when it came out a year or more ago, and I rose from its perusal with a feeling of sheer disgust and contempt for the man who could treat a noble-hearted woman who had saved his life and his reason, as Comte treated his wife.

As soon as I have time I will deal with Comte effectually, you may depend upon that. At the same time, I shall endeavour to be just to what there is (as I hold), really great and good in his clear conception of the necessity of reconstructing society from the bottom to the top "sans dieu ni roi," if I may interpret that somewhat tall phrase as meaning "with our conceptions of religion and politics on a scientific basis."

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\* The Hippocampus minor: compare p. 206.

Comte in his later days was an apostate from his own creed; his "nouveau grand Être suprême" being as big a fetish as ever nigger first made and then worshipped.—Ever yours faithfully,  
T. H. HUXLEY.

It is interesting to note how he invariably submitted his writings to the criticism of his wife before they were seen by any other eye. To her judgment was due the toning down of many a passage which erred by excess of vigour, and the clearing up of phrases which would be obscure to the public. In fact, if an essay met with her approval, he felt sure it would not fail of its effect when published. Writing to her from Norwich on August 23, 1868, he confesses himself with reference to the lecture "On a Piece of Chalk":—

I met Grove who edits *Macmillan*, at the soirée. He pulled the proof of my lecture out of his pocket and said, "Look here, there is one paragraph in your lecture I can make neither top nor tail of. I can't understand what it means." I looked to where his finger pointed, and behold it was the paragraph you objected to when I read you the lecture on the sea shore! I told him, and said I should confess, however set up it might make you.

At the beginning of September, he rejoined his wife and family at Littlehampton, "a grand place for children, because you go *up* rather than *down* into the sea, and it is quite impossible for them to get into mischief by falling," as he described it to his friend Dr. Dohrn, who came down for ten days, eagerly looking forward "to stimulating walks over stock and stone, to Tennyson, Herbert Spencer, and Harry's ringing laugh."

The latter half of the month he spent at or near Dublin, serving upon the Commission on Science and Art Instruction:—

To-day (he writes on September 16), we shall be occupied in inspecting the School of Science and the Glasnevin botanical and agricultural gardens, and to-morrow we begin the session work of examining all the Irishry, who want jobs perpetrated. It is weary work, and the papers are already beginning to tell lies about us and attack us.

The rest of the year he remained in London, except the last four days of December, when he was lecturing at Newcastle, and stayed with Sir W. Armstrong at Jesmond.

TO PROFESSOR HAECKEL

Jan. 21, 1868.

Don't you think we did a right thing in awarding the Copley Medal to Baer last year? The old man was much pleased, and it was a comfort to me to think that we had not let him go to his grave without the highest honour we had to bestow.

I am over head and ears, as we say, in work, lecturing, giving addresses to the working men and (*figurez vous!*) to the clergy.\*

In scientific work the main thing just now about which I am engaged is a revision of the Dinosauria, with an eye to the "Descendenz Theorie." The road from Reptiles to Birds is by way of Dinosauria to the Ratitae. The bird "phylum" was struthious, and wings grew out of rudimentary forelimbs.

You see that among other things I have been reading Ernst Haeckel's *Morphologie*.

The next two letters reflect his views on the proper work to be undertaken by men of unusual scientific capacity—

JERMYN STREET, Jan. 15, 1868.

MY DEAR DOHRN—Though the most procrastinating correspondent in existence when a letter does not absolutely require an answer, I am tolerably well-behaved when something needs to be said or done immediately. And as that appears to me to be the case with your letter of the 13th which has this moment reached me, I lose no time in replying to it.

The Calcutta appointment has been in my hands as well as Turner's, and I have made two or three efforts, all of which unfortunately have proved unsuccessful to find: (1) A man who

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\* On December 12, 1867, there was a meeting of clergy at Sion House, under the auspices of Dean Farrar and the Rev. W. Rogers of Bishopsgate, when the bearing of recent science upon orthodox dogma was discussed. First Huxley delivered an address; some of the clergy present denounced any concessions as impossible; others declared that they had long ago accepted the teachings of geology; whereupon a candid friend inquired, "Then why don't you say so from your pulpits?" (See *Coll. Ess.* iii. 119.)

will do for it and at the same time (2) for whom it will do. Now you fulfil the first condition admirably, but as to the second I have very great doubts.

In the first place the climate of Calcutta is not particularly good for anyone who has a tendency to dysentery, and I doubt very much if you would stand it for six months.

Secondly, we have a proverb that it is not wise to use razors to cut blocks.

The business of the man who is appointed to that museum will be to get it into order. If he does his duty he will give his time and attention to museum work pure and simple, and I don't think that (especially in an Indian climate), he has much energy left for anything else after the day's work is done. Naming and arranging specimens is a most admirable and useful employment, but when you have done it is "cutting blocks," and you, my friend, are a most indubitable razor, and I do not wish to have your edge blunted in that fashion.

If it were necessary for you to win your own bread, one's advice might be modified. Under such circumstances one must do things which are not entirely desirable. But for you who are your own master and have a career before you, to bind yourself down to work six hours a day at things you do not care about and which others could do just as well, while you are neglecting the things which you do care for, and which others could not do so well, would, I think, be amazingly unwise.

Liberavi animam! don't tell my Indian friends I have dissuaded you, but on my conscience I could give no other advice.

We have to thank you three times over. In the first place for a portrait which has taken its place among those of our other friends; secondly for the great pleasure you gave my little daughter Jessie, by the books you so kindly sent; and thirdly, for Fanny Lewald's autobiography which arrived a few days ago.

Jessie is meditating a letter of thanks (a serious undertaking), and when it is sent the mother will have a word to say for herself.

In the middle of October scarlet fever broke out among my children, and they have all had it in succession, except Jessie, who took it seven years ago. The last convalescent is now well, but we had the disease in the house nearly three months, and have been like lepers, cut off from all communication with our neighbours for that time.

We have had a great deal of anxiety, and my wife has been

pretty nearly worn out with nursing day and night; but by great good fortune "the happy family" has escaped all permanent injury, and you might hear as much laughter in the house as at Swanage.

Will you be so kind as to thank Professor Gegenbaur for a paper on the development of the vertebral column of *Lepidosteum* I have just received from him? He has been writing about the process of ossification and the "deck-knochen" question, but I cannot make out exactly where. Could you let me know?

I am anxious for the *Arthropoden Werk*, but I expect to gasp when it comes.

Turn to p. 380 of the new edition of our friend Kölliker's *Handbuch*, and you will find that though a view which I took of the "organon adamantinae" some twelve or fourteen years ago, and which Kölliker has up to this time repudiated, turns out, and is now admitted by him, to be perfectly correct, yet "that I was not acquainted with the facts that would justify the conclusion." Really, if I had time I could be angry.

Pray remember me most kindly to Haeckel, to all whose enemies I wish confusion, and believe me, ever yours faithfully,  
T. H. HUXLEY.

P.S.—I have read a hundred pages or so of Fanny Lewald's 1st Bd., and am delighted with her insight into child-life.

Tyndall was resigning his lectureship at the School of Mines—

JERMYN STREET, June 10, 1868.

MY DEAR TYNDALL—All I can say is, I am heartily sorry.

If you feel that your lectures here interfere with your original work, I should not be a true friend either to science or yourself if I said a word against your leaving us.

But for all that I am and shall remain very sorry.—Ever yours very sincerely,  
T. H. HUXLEY.

If you recommend —, of course I shall be very glad to support him in any way I can. But at present I am rather disposed to d—n anyone who occupies your place.

The following extract is from a letter to Haeckel (November 13, 1868), with reference to the proposed translation of his *Morphologie* by the Ray Society:—

We shall at once look out for a good translator of the text, as the job will be a long and a tough one. My wife (who sends

her best wishes and congratulations on your fatherhood) will do the bits of Goethe's poetry, and I will look after the prose citations.

Next as to the text itself. The council were a little alarmed at the bulk of the book, and it is of the utmost importance that it should be condensed to the uttermost.

Furthermore, English propriety had taken fright at rumours touching the aggressive heterodoxy of some passages. (We do not much mind heterodoxy here, if it does not openly proclaim itself as such.)

And on both these points I had not only to give very distinct assurances, such as I thought your letters had entitled me to give; but in a certain sense to become myself responsible for your behaving yourself like a good boy!

If I had not known you and understood your nature and disposition as I fancy I do, I should not have allowed myself to be put in this position; but I have implicit faith in your doing what is wise and right, and so making it tenable.

There is not the slightest desire to make you mutilate your book or leave out anything which you conceive to be absolutely essential; and I on my part should certainly not think of asking you to make any alteration which would not in my judgment improve the book quite irrespectively of the tastes of the British public.

[Alterations are suggested.] But I stop. By this time you will be swearing at me for attacking all your favourite bits. Let me know what you think about these matters.

I congratulate you and Madame Haeckel heartily on the birth of your boy. Children work a greater metamorphosis in men than any other condition of life. They ripen one wonderfully and make life ten times better worth having than it was.

26 ABBEY PLACE, *Nov.* 15, 1868.

MY DEAR DARWIN—You are always the *bienvenu*, and we shall be right glad to see you on Sunday morning.

We breakfast at 8.30, and the decks are clear before nine. I would offer you breakfast, but I know it does not suit you to come out unfed; and besides you would abuse the opportunity to demoralise Harry.\*—Ever yours faithfully,

T. H. HUXLEY.

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\* This small boy of nearly four was a great favourite of Darwin's. When we children were all staying at Down about this time, Darwin



An undated note to Darwin belongs to the very end of this year, or to the beginning of the next :—

The two volumes of the new book have just reached me. My best thanks for them; and if you can only send me a little time for reading within the next three months you will heighten the obligation twenty-fold. I wish I had either two heads or a body that needed no rest!

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himself would come in upon us at dinner, and patting him on the head, utter what has become a household word amongst us, "Make yourself at home, and take large mouthfuls."

## CHAPTER XXIII

1869

IN 1869 Huxley published five palaeontological papers, chiefly upon the Dinosaurs (see letter above to Haeckel, January 21, 1868). His physiological researches upon the development of parts of the skull, are represented by a paper for the Zoological Society, while the *Introduction to the Classification of Animals* was a reprint this year of the substance of six lectures in the first part of the lectures on *Elementary Comparative Anatomy* (1864), which were out of print, but still in demand by students.

As President of the Ethnological Society, he delivered an inaugural address "On the Ethnology and Archaeology of India," on March 9, and another "On the Ethnology and Archaeology of North America," on April 13. As president of the Society, moreover, he urged upon the Government the advisability of forming a systematic series of photographs of the various races comprehended in the British Empire, and was officially called upon to offer suggestions for carrying out the project. This appears to be an amplification of Sir Joseph Fayrer's plan in 1866, with respect to all the tribes of India (see p. 294, and Appendix I.).

On April 7 he delivered his "Scientific Education: Notes of an After-Dinner Speech" before the Philomathic Society at Liverpool (*Coll. Ess.* iii. 3), one part of which deals with the attitude of the clergy towards physical science, and expresses the necessary antagonism between science and Roman Catholic doctrine which appears more forcibly in one of his speeches at the School Board in 1871 (see p. 384).

In this and other educational addresses, he had suggested that one of the best ways of imparting to children a preliminary knowledge of the phenomena of nature would be a course of what the Germans call "Erdkunde," or general information about the world we live in. It should reach from our simplest everyday observations to wide generalisations of physical science; and should supply a background for the study of history. To this he gave the name "Physiography," a name which he believed to be original, until in 1877 his attention was called to the fact that a *Physiographic* had been published in Paris thirty years before.

The idea was no new one with him. Part of his preliminary lectures at the School of Mines had been devoted to something of the kind for the last dozen years; he had served on the Committee of the British Association, appointed in 1866 as the result of a paper by the present Dean Farrar, then a Harrow master, "On the Teaching of Science in the Public Schools,"\* to report upon the whole question. Moreover, in consultation with Dr. Tyndall, he had drawn up a scheme in the winter 1868-69, for the science teaching in the International College, on the Council of which they both were.

Seven yearly grades were arranged in this scheme, proceeding from the simplest account of the phenomena of nature taught chiefly by object lessons, largely through the elements of Physics and Botany, Chemistry and Human Physiology—all illustrated with practical demonstrations—to more advanced work in these subjects, as well as in Social Science, which embraced not only the theory of commerce and government, but the Natural History of Man up to the point at which Ethnology and Archaeology touch history.

It is interesting to note that the framers of this report thought it necessary to point out that one master could not teach all these subjects.

In the three later stages the boys might follow alter-

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\* See p. 298.

native lines of study according to their tastes and capacities ; but of the earlier part, which was to be obligatory upon all, the report says :—These four years study, if properly employed by the teachers, will constitute a complete preparatory scientific course. However slight the knowledge of details conferred, a wise teacher of any of these subjects will be able to make that teaching thorough ; and to give the scholar a notion of the methods and of the ideas which he will meet with in his further progress in all branches of physical science.

In fact, the fundamental principle was to begin with Observational Science, facts collected ; to proceed to Classificatory Science, facts arranged ; and to end with Inductive Science, facts reasoned upon and laws deduced.

While he was much occupied with the theoretical and practical difficulties of such a scheme of science teaching for general use, he was asked by his friend, the Rev. W. Rogers of Bishopsgate, if he would not deliver a course of lectures on elementary science to boys of the schools in which the latter was interested.

He finally accepted in the following letter, and as the result, delivered twelve lectures week by week from April to June to a large audience at the London Institution in Finsbury Circus, lectures not easily forgotten by the children who listened to them nor by their elders :—

JERMYN STREET, *Feb.* 5, 1869.

MY DEAR ROGERS—Upon due reflection I am not indisposed to undertake the course of lessons we talked about the other day, though they will cost me a good deal of trouble in various ways, and at a time of the year when I am getting to the end of my tether and don't much like trouble.

But the scheme is too completely in harmony with what (in conjunction with Tyndall and others) I have been trying to bring about in schools in general—not to render it a great temptation to me to try to get it into practical shape.

All I have to stipulate is that we shall have a clear understanding on the part of the boys and teachers that the discourses are to [be] *Lessons* and not talkee-talkee lectures. I should like it to be understood that the boys are to take notes and to be examined at the end of the course. Of course I cannot

undertake to be examiner, but the schools might make some arrangement on this point.

You see my great object is to set going something which can be worked in every school in the country in a thorough and effectual way, and set an example of the manner in which I think this sort of introduction to science ought to be managed.

Unless this can be done I would rather not embark in a project which will involve much labour, worry, and interruption to my regular line of work.

I met Mr. [illegible] last night, and discussed the subject briefly with him.—Ever yours very faithfully,

T. H. HUXLEY.

I enclose a sort of rough programme of the kind of thing I mean, cut up from a project of instruction for a school about which I am now busy. The managers might like to see it. But I shall be glad to have it returned.

These lectures were repeated in November at South Kensington Museum, as the first part of a threefold course to women on the elements of physical science, and the *Times* reporter naively remarks that under the rather alarming name of Physiography, many of the audience were no doubt surprised to hear an exceedingly simple and lucid description of a river-basin. Want of leisure prevented him from bringing out the lectures in book form until November 1877. When it did appear, however, the book, like his other popular works, had a wide sale, and became the forerunner of an immense number of school-books on the subject.

As President of the Geological Society, he delivered an address (*Coll. Ess.* viii. 305), at the anniversary meeting, February 19, upon the "Geological Reform" demanded by the considerations advanced by the physicists, as to the age of the earth and the duration of life upon it. From the point of view of biology he was ready to accept the limits suggested, provided that the premisses of Sir William Thomson's \* argument were shown to be perfectly reliable; but he pointed out a number of considerations which might profoundly modify the results of the isolated causes adduced;

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\* Now Lord Kelvin.

and uttered a warning against the possible degradation of "a proper reverence for mathematical certainty" into "a superstitious respect for all arguments arrived at by process of mathematics."\*

At the close of the year, as his own period of office came to an end, it was necessary to select a new president of the Geological. He strongly urged Professor (afterwards Sir Joseph) Prestwich to stand, and when the latter consented, a few weeks, by the way, before his marriage was to take place, replied:—

JERMYN STREET, *Dec.* 16, 1869.

MY DEAR PRESTWICH—Many thanks for your letter. Your consent to become our President for the next period will give as unfeigned satisfaction to the whole body of the Society as it does to me and your other personal friends.

I have looked upon the affair as settled since our last talk, and a very great relief it has been to my mind.

There is no doubt public-dinner speaking (and indeed all public speaking) is nervous work. I funk horribly, though I never get the least credit for it. But it is like swimming, the worst of it is in the first plunge; and after you have taken your "header" it's not so bad (just like matrimony, by the way; only don't be so mean as to go and tell a certain lady I said so, because I want to stand well in her books).

Of course you may command me in all ways in which I can possibly be of use. But as one of the chiefs of the Society, and personally and scientifically popular with the whole body, you start with an immense advantage over me, and will find no difficulties before you.

We will consider this business formally settled, and I shall speak of it officially.—Ever yours very faithfully,

T. H. HUXLEY.

I cannot place the following letter to Matthew Arnold with certainty, but it must have been written about this period.† Everyone will sympathise with the situation:—

\* See *Coll. Ess.* viii. *Introd.* p. 8.

† The most probable date being 1869, for on July 1 of that year he dined with Matthew Arnold at Harrow.

26 ABBEY PLACE, July 8.

MY DEAR ARNOLD—Look at Bishop Wilson on the sin of covetousness and then inspect your umbrella stand. You will there see a beautiful brown smooth-handled umbrella which is *not* your property.

Think of what the excellent prelate would have advised and bring it with you next time you come to the club. The porter will take care of it for me.—Ever yours faithfully,

T. H. HUXLEY.

The following letter shows how paleontological work was continually pouring in upon him:—

JERMYN STREET, May 7, 1869.

MY DEAR DARWIN—Do you recollect recommending \* that the *Nassau*, which sailed under Capt. Mayne's command for Magellan's Straits some years ago should explore a fossiliferous deposit at the Gallegos River?

They visited the place the other day as you will see by Cunningham's letter which I enclose, and got some fossils which are now in my hands.

The skull to which Cunningham refers, consists of little more than the jaws, but luckily nearly all the teeth are in place, and prove it to be an entirely new ungulate mammal with teeth in uninterrupted series like *Anoplotherium*, about as big as a small horse.

What a wonderful assemblage of beasts there seems to have been in South America! I suspect if we could find them all they would make the classification of the Mammalia into a horrid mess.—Ever yours faithfully,

T. H. HUXLEY.

And on July 16, 1869, he writes again to Darwin:—

To tell you the truth, what with fossils, Ethnology and the great question of "Darwinismus" which is such a worry to us all, I have lost sight of the collectors and naturalists "by grace of the dredge," almost as completely as you have.

Indeed, the pressure was so great that he resolved to give up the Hunterian Lectures at the College of Surgeons, as he had already given up the Fullerian Professorship at the Royal Institution. So he writes to Professor (afterwards Sir William) Flower:—

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\* See p. 297.

JERMYN STREET, *June 7, 1869.*

*Private, Confidential, Particular.*

MY DEAR FLOWER—I have written to Quain \* to tell him that I do not propose to be put in nomination for the Hunterian Chair this year. I really cannot stand it with the British Association hanging over my head. So make thy shoulders ready for the gown, and practise the goose-step in order to march properly behind the mace, and I will come and hear your inaugural.—  
Ever yours, T. H. HUXLEY.

The meeting of the Association to which he refers took place at Exeter, and he writes of it to Darwin (September 28):—

As usual, your abominable heresies were the means of getting me into all sorts of hot water at the Association. Three parsons set upon you, and if you were the most malicious of men you could not have wished them to have made greater fools of themselves than they did. They got considerably chaffed, and that was all they were worth.†

And to Tyndall, whom an accident had kept in Switzerland:—

After a sharp fight for Edinburgh, Liverpool was adopted as the place of meeting for the Association of 1870, and I am to be President; although the *Times* says that my best friends tremble for me. (I hope you are not among that particular lot of my best friends.)

I think we shall have a good meeting, and you know you are pledged to give a lecture even if you come with your leg in a sling.

The foundation of the Metaphysical Society in 1869 was not without interest as a sign of the times. As in the new birth of thought which put a period to the Middle Ages, so in the Victorian Renaissance, a vast intellectual ferment had taken immediate shape in a fierce struggle with long

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\* President of the Royal College of Surgeons.

† It is perhaps scarcely worth while exhuming these long-forgotten arguments in their entirety; but anyone curious enough to consult the report of the meeting preserved in the files of the *Academy*, will find, among other things, an entirely novel theory as to the relation of the Cherubim to terrestrial creation.



established orthodoxy. But whereas Luther displaced Erasmus, and the earlier reformers fought out the quarrel with the weapons of the theologian rather than those of the Humanist, the latter-day reformation was based upon the extension of the domain of positive science, upon the force of historical criticism, and the sudden reorganisation of accumulated knowledge in the light of a physical theory adequate to explain it.

These new facts and the new or re-vivified theories based upon them, remained to be reckoned with after the first storm of denunciation had passed by, and the meeting at Sion House in 1867\* showed that some at least of the English clergy besides Colenso and Stanley wished to understand the real meaning of the new movement. Although the wider effect of the scientific revival in modifying theological doctrine was not yet fully apparent, the irreconcilables grew fewer and less noisy, while the injustice of their attempts to stifle the new doctrine and to ostracise its supporters became more glaring.

Thus among the supporters of the old order of thought, there was one section more or less ready to learn of the new. Another, seeing that the doctrines of which they were firmly convinced were thrust aside by the rapid advance of the new school, thought, as men not unnaturally think in the like situation, that the latter did not duly weigh what was said on their side. Hence this section eagerly entered into the proposal to found a society which should bring together men of diverse views, and effect, as they hoped, by personal discussion of the great questions at issue, in the manner and with the machinery of the learned societies, a *rapprochement* unattainable by written debate.

The scheme was first propounded by Mr. James Knowles, then editor of the *Contemporary Review*, now of the *Nineteenth Century*, in conversation with Tennyson and Professor Pritchard (Savilian Professor of Astronomy at Oxford).

Thus the Society came to be composed of men of the most opposite ways of thinking and of very various occupa-

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\* See p. 325.

tions in life. The largest group was that of churchmen:—ecclesiastical dignitaries such as Thompson, the Archbishop of York, Ellicott, Bishop of Gloucester and Bristol, and Dean Alford; staunch laymen such as Mr. Gladstone, Lord Selborne, and the Duke of Argyll; while the liberal school was represented by Dean Stanley, F. D. Maurice, and Mark Pattison. Three distinguished converts from the English Church championed Roman Catholic doctrine—Cardinal Manning, Father Dalgairns, and W. G. Ward, while Unitarianism claimed Dr. James Martineau. At the opposite pole, in antagonism to Christian theology and theism generally, stood Professor W. K. Clifford, whose youthful brilliancy was destined to be cut short by an untimely death. Positivism was represented by Mr. Frederic Harrison; and Agnosticism by such men of science or letters as Huxley and Tyndall, Mr. John Morley, and Mr. Leslie Stephen.

Something was gained, too, by the variety of callings followed by the different members. While there were professional students of philosophy, like Prof. Henry Sidgwick or Sir Alexander Grant, the Principal of Edinburgh University, in some the technical knowledge of philosophy was overlaid by studies in history or letters; in others, by the practical experience of the law or politics; in others, again, medicine or biology supplied a powerful psychological instrument. This fact tended to keep the discussions in touch with reality on many sides.

There was Tennyson, for instance, the only poet who thoroughly understood the movement of modern science, a stately but silent member; Mr. Ruskin, J. A. Froude, Shadworth Hodgson, R. H. Hutton of the *Spectator*, James Hinton, and the well-known essayist, W. R. Greg; Sir James Fitzjames Stephen, Sir F. Pollock, Robert Lowe (Lord Sherbrooke), Sir M. E. Grant Duff, and Lord Arthur Russell; Sir John Lubbock, Dr. W. B. Carpenter, Sir William Gull, and Sir Andrew Clark.

Of contemporary thinkers of the first rank, neither John Stuart Mill nor Mr. Herbert Spencer joined the society. The letter of the former declining the invitation to join (given in the *Life of W. G. Ward*, p. 299) is extremely

characteristic. He considers the object of the projectors very laudable, "but it is very doubtful whether it will be realised in practice." The undoubted advantages of oral discussion on such questions are, he continues, best realised if undertaken in the manner of the Socratic dialogue, between one and one; but less so in a mixed assembly. He therefore did not think himself justified in joining the society at the expense of other occupations for which his time was already engaged. And he concludes by defending himself against the charge of not paying fair attention to the arguments of his opponents.

It followed from the composition of the society that the papers read were less commonly upon technical questions of metaphysics, such as "Matter and Force" or "The Relation of Will to Thought," than upon those of more vivid moral or religious interest, such as "What is Death?" "The Theory of a Soul," "The Ethics of Belief," or "Is God Unknowable," in which wide scope was given to the emotions as well as the intellect of each disputant.

The method of the Society was for the paper to be printed and circulated among the members before the meeting, so that their main criticisms were ready in advance. The discussions took place after a dinner at which many of the members would appear; and if the more formal debates were not more effectual than predicted by J. S. Mill, the informal discussions, almost conversations, at smaller meetings, and the free course of talk at the dinner table, did something to realise the primary objects of the society. The personal *rapprochement* took place, but not philosophic compromise or conversion. Whether or not the tone adopted after this period by the clerical party at large was affected by the better understanding on the part of their representatives in the Metaphysical Society of the true aims of their opponents and the honest and substantial difficulties which stood in the way of reunion, it is true that the violent denunciations of the sixties decreased in number and intensity; the right to free expression of reasoned opinion on serious fact was tacitly acknowledged; and, being less attacked, Huxley himself began to be regarded in the light

of a teacher rather than an iconoclast. The question began to be not whether such opinions are wicked, but whether from the point of view of scientific method they are irrefragably true.

The net philosophical result of the society's work was to distinguish the essential and the unessential differences between the opposite parties; the latter were to a great extent cleared up; but the former remained all the more clearly defined in logical nakedness for the removal of the side issues and the personal idiosyncrasies which often obscured the main issues. Indeed, when this point was reached by both parties, when the origins and consequences of the fundamental principles on either side had been fully discussed and mutual misunderstandings removed to the utmost, so that only the fundamentals themselves remained in debate, there was nothing left to be done. The society, in fact, as Huxley expressed it, "died of too much love."

Indeed, it is to be noticed that, despite the strong antagonism of principle and deductions from principle which existed among the members, the rule of mutual toleration was well kept. The state of feeling after ten years' open struggle seemed likely to produce active collision between representatives of the opposing schools at close quarters. "We all thought it would be a case of Kilkeny cats," said Huxley many years afterwards. "Hats and coats would be left in the hall, but there would be no owners left to put them on again." But only one flash of the sort was elicited. One of the speakers at an early meeting insisted on the necessity of avoiding anything like moral disapprobation in the debates. There was a pause; then W. G. Ward said: "While acquiescing in this condition as a general rule, I think it cannot be expected that Christian thinkers shall give no sign of the horror with which they would view the spread of such extreme opinions as those advocated by Mr. Huxley." Another pause; then Huxley, thus challenged, replied: "As Dr. Ward has spoken, I must in fairness say that it will be very difficult for me to conceal my feeling as to the intellectual degradation which

would come of the general acceptance of such views as Dr. Ward holds." \*

No amount of argument could have been more effectual in supporting the claim for mutual toleration than these two speeches, and thenceforward such forms of criticism were conspicuous by their absence. And where honesty of conviction was patent, mutual toleration was often replaced by personal esteem and regard. "Charity, brotherly love," writes Huxley, "were the chief traits of the Society. We all expended so much charity, that, had it been money, we should every one have been bankrupt."

The special part played in the society by Huxley was to show that many of the axioms of current speculation are far from being axiomatic, and that dogmatic assertion on some of the cardinal points of metaphysic is unwarranted by the evidence of fact. To find these seeming axioms set aside as unproven, was, it appears from his *Life*, disconcerting to such members of the society as Cardinal Manning, whose arguments depended on the unquestioned acceptance of them. It was no doubt the observation of a similar attitude of mind in Mr. Gladstone towards metaphysical problems which provoked Huxley to reply, when asked whether Mr. Gladstone was an expert metaphysician—"An expert in metaphysics? He does not know the meaning of the word."

In addition to his share in the discussions, Huxley contributed three papers to the society. The first, read November 17, 1869, was on "The views of Hume, Kant, and Whately on the logical basis of the doctrine of the Immortality of the Soul," showing that these thinkers agreed in holding that no such basis is given by reasoning, apart, for instance, from revelation. A summary of the argument appears in the essay on Hume (*Coll. Ess.* vi. 201, sq.).

On November 8, 1870, he read a paper, "Has a Frog a Soul? and if so, of what Nature is that Soul?" Experiment shows that a frog deprived of consciousness and volition by the removal of the front part of its brain, will, under the action of various stimuli, perform many acts

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\* *Life of W. G. Ward*, by Wilfrid Ward, p. 309.

which can only be called purposive, such as moving to recover its balance when the board on which it stands is inclined, or scratching where it is made uncomfortable, or croaking when pressed in a particular spot. If its spinal cord be severed, the lower limbs, disconnected from the brain, will also perform actions of this kind. The question arises, Is the frog entirely a soulless automaton, performing all its actions directly in response to external stimuli, only more perfectly and with more delicate adjustment when its brain remains intact, or is its soul distributed along its spinal marrow, so that it can be divided into two parts independent of one another?

The professed metaphysician might perhaps tend to regard such consideration as irrelevant; but if the starting-point of metaphysics is to be found in psychology, psychology itself depends to no small extent upon physiology. This question, however, Huxley did not pretend to solve. In the existing state of knowledge he believed it to be insoluble. But he thought it was not without its bearing upon the supposed relations of soul and body in the human subject, and should serve to give pause to current theories on the matter.

His third paper, read January 11, 1876, was on the "Evidence of the Miracle of the Resurrection," in which he argued that there was no valid evidence of actual death having taken place. His rejection of the miraculous had led to an invitation from some of his opponents in the society to write a paper on a definite miracle, and explain his reasons for not accepting it. His choice of subject was due to two reasons: firstly, it was a cardinal instance; secondly, it was a miracle not worked by Christ Himself, and therefore a discussion of its genuineness could offer no suggestion of personal fraud, and hence would avoid inflicting gratuitous pain upon believers in it.

This certainty that there exist many questions at present insoluble, upon which it is intellectually, and indeed morally wrong to assert that we have real knowledge, had long been with him, but, although he had earned abundant odium by openly resisting the claims of dogmatic authority, he had

not been compelled to define his philosophical position until he entered the Metaphysical Society. How he came to enrich the English language with the name "Agnostic" is explained in his article "Agnosticism" (*Coll. Ess.* v. pp. 237-239).

After describing how it came about that his mind "steadily gravitated towards the conclusions of Hume and Kant," so well stated by the latter as follows:—

The greatest and perhaps the sole use of all philosophy of pure reason is, after all, merely negative, since it serves not as an organon for the enlargement (of knowledge), but as a discipline for its delimitation; and, instead of discovering truth, has only the modest merit of preventing error:—

he proceeds—

When I reached intellectual maturity, and began to ask myself whether I was an atheist, a theist, or a pantheist; a materialist or an idealist; a Christian or a freethinker; I found that the more I learned and reflected, the less ready was the answer; until, at last, I came to the conclusion that I had neither art nor part with any of these denominations, except the last. The one thing in which most of these good people were agreed was the one thing in which I differed from them. They were quite sure they had attained a certain "gnosis"—had, more or less successfully, solved the problem of existence; while I was quite sure I had not, and had a pretty strong conviction that the problem was insoluble. And, with Hume and Kant on my side, I could not think myself presumptuous in holding fast by that opinion. . . .

This was my situation when I had the good fortune to find a place among the members of that remarkable confraternity of antagonists, long since deceased, but of green and pious memory, the Metaphysical Society. Every variety of philosophical and theological opinion was represented there, and expressed itself with entire openness; most of my colleagues were *-ists* of one sort or another; and, however kind and friendly they might be, I, the man without a rag of a label to cover himself with, could not fail to have some of the uneasy feelings which must have beset the historical fox when, after leaving the trap in which his tail remained, he presented himself to his normally elongated companions. So I took thought, and invented what I conceived

to be the appropriate title of "agnostic." It came into my head as suggestively antithetic to the "gnostic" of Church history, who professed to know so much about the very things of which I was ignorant; and I took the earliest opportunity of parading it at our Society, to show that I, too, had a tail, like the other foxes. To my great satisfaction, the term took; and when the *Spectator* had stood godfather to it, any suspicion in the minds of respectable people that a knowledge of its parentage might have awakened was, of course, completely lulled.

As for the dialectical powers he displayed in the debates, it was generally acknowledged that in this, as well as in the power of conducting a debate, he shared the pre-eminence with W. G. Ward. Indeed, a proposal was made that the perpetual presidency in alternate years should be vested in these two; but time and health forbade.

His part in the debates is thus described in a letter to me from Professor Henry Sidgwick:—

DEAR MR. HUXLEY—I became a member of the Metaphysical Society, I think, at its first meeting in 1869; and, though my engagements in Cambridge did not allow me to attend regularly, I retain a very distinct recollection of the part taken by your father in the debates at which we were present together. There were several members of the Society with whose philosophical views I had, on the whole, more sympathy; but there was certainly no one to whom I found it more pleasant and more instructive to listen. Indeed I soon came to the conclusion that there was only one other member of our Society who could be placed on a par with him as a debater; on the subjects discussed at our meetings; and that was, curiously enough, a man of the most diametrically opposite opinions—W. G. Ward, the well-known advocate of Ultramontaniam. Ward was by training, and perhaps by nature, more of a dialectician; but your father was unrivalled in the clearness, precision, succinctness, and point of his statements, in his complete and ready grasp of his own system of philosophical thought, and the quickness and versatility with which his thought at once assumed the right attitude of defence against any argument coming from any quarter. I used to think that while others of us could perhaps find, on the spur of the moment, *an* answer more or less effective to some unexpected attack, your father seemed always able to find *the* answer—I mean the answer that it was reasonable to



give, consistently with his general view, and much the same answer that he would have given if he had been allowed the fullest time for deliberation.

The general tone of the Metaphysical Society was one of extreme consideration for the feelings of opponents, and your father's speaking formed no exception to the general harmony. At the same time I seem to remember him as the most combative of all the speakers who took a leading part in the debates. His habit of never wasting words, and the edge naturally given to his remarks by his genius for clear and effective statement, partly account for this impression; still I used to think that he liked fighting, and occasionally liked to give play to his sarcastic humour—though always strictly within the limits imposed by courtesy. I remember that on one occasion when I had read to the Society an essay on the "Incoherence of Empiricism," I looked forward with some little anxiety to his criticisms; and when they came, I felt that my anxiety had not been superfluous; he "went for" the weak points of my argument in half a dozen trenchant sentences, of which I shall not forget the impression. It was hard hitting, though perfectly courteous and fair.

I wish I could remember what he said, but the memory of all the words uttered in these debates has now vanished from my mind, though I recall vividly the general impression that I have tried briefly to put down.—Believe me, yours very truly,

HENRY SIDGWICK.

## CHAPTER XXIV

1870

WITH the year 1870 comes another turning-point in Huxley's career. From his return to England in 1850 till 1854 he had endured four years of hard struggle, of hope deferred; his reputation as a zoologist had been established before his arrival, and was more than confirmed by his personal energy and power. When at length settled in the professorship at Jermyn Street, he was so far from thinking himself more than a beginner who had learned to work in one corner of the field of knowledge, still needing deep research into all kindred subjects in order to know the true bearings of his own little portion, that he treated the next six years simply as years of further apprenticeship. Under the suggestive power of the *Origin of Species* all these scattered studies fell suddenly into due rank and order; the philosophic unity he had so long been seeking inspired his thought with tenfold vigour, and the battle at Oxford in defence of the new hypothesis first brought him before the public eye as one who not only had the courage of his convictions when attacked, but could, and more, would, carry the war effectively into the enemy's country. And for the next ten years he was commonly identified with the championship of the most unpopular view of the time; a fighter, an assailant of long-established fallacies, he was too often considered a mere iconoclast, a subverter of every other well-rooted institution, theological, educational, or moral.

It is difficult now to realise with what feelings he was regarded in the average respectable household in the sixties and early seventies. His name was anathema; he was a

terrible example of intellectual pravity beyond redemption, a man with opinions such as cannot be held "without grave personal sin on his part" (as was once said of Mill by W. G. Ward, see p. 451), the representative in his single person of rationalism, materialism, atheism, or if there be any more abhorrent "ism"—in token of which as late as 1892 an absurd zealot at the headquarters of the Salvation Army crowned an abusive letter to him at Eastbourne by the statement, "I hear you have a local reputation as a Bradlaughite."

But now official life began to lay closer hold upon him. He came forward also as a leader in the struggle for educational reform, seeking not only to perfect his own biological teaching, but to show, in theory and practice, how scientific training might be introduced into the general system of education. He was more than once asked to stand for Parliament, but refused, thinking he could do more useful work for his country outside.

The publication in 1870 of *Lay Sermons*, the first of a series of similar volumes, served, by concentrating his moral and intellectual philosophy, to make his influence as a teacher of men more widely felt. The "active scepticism," whose conclusions many feared, was yet acknowledged as the quality of mind which had made him one of the clearest thinkers and safest scientific guides of his time, while his keen sense of right and wrong made the more reflective of those who opposed his conclusions hesitate long before expressing a doubt as to the good influence of his writings. This view is very clearly expressed in a review of the book in the *Nation* (New York, 1870, xi. 407).

And as another review of the *Lay Sermons* puts it (*Nature*, iii. 22), he began to be made a kind of popular oracle, yet refused to prophesy smooth things.

During the earlier period, with more public demands made upon him than upon most men of science of his age and standing, with the burden of four Royal Commissions and increasing work in learned societies in addition to his regular lecturing and official paleontological work, and the many addresses and discourses in which he spread abroad in

the popular mind the leaven of new ideas upon nature and education and the progress of thought, he was still constantly at work on biological researches of his own, many of which took shape in the Hunterian lectures at the College of Surgeons from 1863-1870. But from 1870 onward, the time he would spare to such research grew less and less. For eight years he was continuously on one Royal Commission after another. His administrative work on learned societies continued to increase; in 1869-70 he held the presidency of the Ethnological Society, with a view to effecting the amalgamation with the Anthropological, "the plan," as he calls it, "for uniting the Societies which occupy themselves with man (that excludes "Society" which occupies itself chiefly with woman)." He became president of the Geological Society in 1872, and for nearly ten years, from 1871 to 1880, he was secretary of the Royal Society, an office which occupied no small portion of his time and thought, "for he had formed a very high ideal of the duties of the Society as the head of science in this country, and was determined that it should not at least fall short through any lack of exertion on his part" (Sir M. Foster, R. S. Obit. Not.).\*

The year 1870 itself was one of the busiest he had ever known. He published one biological and four paleontological memoirs, and sat on two Royal Commissions, one on the Contagious Diseases Acts, the other on Scientific Instruction, which continued until 1875.

The three addresses which he gave in the autumn, and his election to the School Board will be spoken of later; in the first part of the year he read two papers at the Ethnological Society, of which he was president, on "The Geographical Distribution of the Chief Modifications of Mankind," March 9—and on "The Ethnology of Britain," May 10—the substance of which appeared in the *Contemporary Review* for July under the title of "Some Fixed Points in British Ethnology" (*Coll. Ess.* vii. 253). As president also of the Geological Society and of the British Association,

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\* See Appendix II.

he had two important addresses to deliver. In addition to this, he delivered an address before the Y.M.C.A. at Cambridge on "Descartes' Discourse."

How busy he was may be gathered from his refusal of an invitation to Down:—

26 ABBEY PLACE, Jan. 21, 1870.

MY DEAR DARWIN—It is hard to resist an invitation of yours—but I dine out on Saturday; and next week three evenings are abolished by Societies of one kind or another. And there is that horrid Geological address looming in the future!

I am afraid I must deny myself at present.

I am glad you liked the sermon. Did you see the "Devonshire man's" attack in the *Pall Mall*?

I have been wasting my time in polishing that worthy off. I would not have troubled myself about him, if it were not for the political bearing of the Celt question just now.

My wife sends her love to all you.—Ever yours,

T. H. HUXLEY.

The reference to the "Devonshire Man" is as follows:—Huxley had been speaking of the strong similarity between Gaul and German, Celt and Teuton, before the change of character brought about by the Latin conquest; and of the similar commixture, a dash of Anglo-Saxon in the mass of Celtic, which prevailed in our western borders and many parts of Ireland, *e.g.* Tipperary.

The "Devonshire Man" wrote on Jan. 18 to the *Pall Mall Gazette*, objecting to the statement that "Devonshire men are as little Anglo-Saxons as Northumbrians are Welsh." Huxley replied on the 21st, meeting his historical arguments with citations from Freeman, and especially by completing his opponent's quotation from Caesar, to show that under certain conditions, the Gaul was indistinguishable from the German. The assertion that the Anglo-Saxon character is midway between the pure French or Irish and the Teutonic, he met with the previous question, "Who is the pure Frenchman? Picard, Provençal, or Breton? or the pure Irish? Milesian, Firbolg, or Cruithneach?"

But the "Devonshire Man" did not confine himself to science. He indulged in various personalities, to the smart-

est of which, a parody of Sydney Smith's dictum on Dr. Whewell, Huxley replied:—

“A Devonshire Man” is good enough to say of me that “cutting up monkeys is his forte, and cutting up men is his foible.” With your permission, I propose to cut up “A Devonshire Man”; but I leave it to the public to judge whether, when so employed, my occupation is to be referred to the former or to the latter category.

For this he was roundly lectured by the *Spectator* on January 29, in an article under the heading “Pope Huxley.” Regardless of the rights or wrongs of the controversy, he was chidden for the abusive language of the above paragraph, and told that he was a very good anatomist, but had better not enter into discussions on other subjects.

The same question is developed in the address to the Ethnological Society later in the year and in “Some Fixed Points in British Ethnology” (*Contemporary Review*, 1871), and reiterated in an address from the chair in Section D at the British Association in 1878 at Dublin, and in a letter to the *Times* for October 12, 1887, apropos of a leading article upon “British Race-types of To-day.”

Letter-writing was difficult under such pressure of work, but the claims of absent friends were not wholly forgotten, though left on one side for a time, and the warm-hearted Dohrn, who could not bear to think himself forgotten, managed to get a letter out of him—not on scientific business.

26 ABBEY PLACE, Jan. 30, 1870.

MY DEAR DOHRN—In one sense I deserve all the hard things you may have said and thought about me, for it is really scandalous and indefensible that I have not written to you. But in another sense, I do not, for I have very often thought about you and your doings, and as I have told you once before, your memory always remains green in the “happy family.”

But what between the incessant pressure of work and an inborn aversion to letter-writing, I become a worse and worse correspondent the longer I live, and unless I can find one or two friends who will [be] content to bear with my infirmities and believe that however long before we meet, I shall be ready to take them up again exactly where I left off, I shall be a friendless old man.

As for your old Goethe, you are mistaken. The Scripture says that "a living dog is better than a dead lion," and I am a living dog. By the way I bought Cotta's edition of him the other day, and there he stands on my bookcase in all the glory of gilt, black, and marble edges. Do you know I did a version of his *Aphorisms on Nature* into English the other day.\* It astonishes the British Philistines not a little. When they began to read it they thought it was mine, and that I had suddenly gone mad!

But to return to your affairs instead of my own. I received your volume on the *Arthropods* the other day, but I shall not be able to look at it for the next three weeks, as I am in the midst of my lectures, and have an annual address to deliver to the Geological Society on the 18th February, when, I am happy to say, my tenure of office as President expires.

After that I shall be only too glad to plunge into your doings and, as always, I shall follow your work with the heartiest interest. But I wish you would not take it into your head that Darwin or I, or anyone else thinks otherwise than highly of you, or that you need "re-establishing" in any one's eyes. But I hope you will not have finished your work before the autumn, as they have made me President of the British Association this year, and I shall be very busy with my address in the summer. The meeting is to take place in Liverpool on the 14th September, and I live in hope that you will be able to come over. Let me know if you can, that I may secure you good quarters.

I shall ask the wife to fill up the next half sheet. But for Heaven's sake don't be angry with me in English again. It's far worse than a scolding in Deutsch, and I have as little forgotten my German as I have my German friends.

On February 18 he delivered his farewell address † to the Geological Society, on laying down the office of President. He took the opportunity to revise his address to the society in 1862, and pointed out the growth of evidence in favour of the evolution theory, and in particular traced the paleontological history of the horse, through a series of fossil types approaching more and more to a generalised ungulate type and reaching back to a three-toed ancestor, or collateral of such an ancestor, itself possessing rudiments of the two other toes which appertain to the average quadruped.

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\* For the first number of *Nature*, November 1869.

† "Paleontology and the Doctrine of Evolution," *Coll. Ess.* viii.

If (he said) the expectation raised by the splints of the horses that, in some ancestor of the horses, these splints would be found to be complete digits, has been verified, we are furnished with very strong reasons for looking for a no less complete verification of the expectation that the three-toed *Plagiolophus*-like "avus" of the horse must have been a five-toed "atavus" at some early period.

Six years afterwards, this forecast of paleontological research was to be fulfilled, but at the expense of the European ancestry of the horse. A series of ancestors, similar to these European fossils, but still more equine, and extending in unbroken order much farther back in geological time, was discovered in America. His use of this in his New York lectures as demonstrative evidence of evolution, and the immediate fulfilment of a further prophecy of his will be told in due course.

His address to the Cambridge Y.M.C.A., "A Commentary on Descartes' 'Discourse touching the method of using reason rightly, and of seeking scientific truth,'" was delivered on March 24. This was an attempt to give this distinctively Christian audience some vision of the world of science and philosophy, which is neither Christian nor Unchristian, but Extra-christian, and to show "by what methods the dwellers therein try to distinguish truth from falsehood, in regard to some of the deepest and most difficult problems that beset humanity, "in order to be clear about the actions, and to walk sure-footedly in this life," as Descartes says. For Descartes had laid the foundation of his own guiding principle of "active scepticism, which strives to conquer itself."

Here again, as in the *Physical Basis of Life*, but with more detail, he explains how far materialism is legitimate, is, in fact, a sort of shorthand idealism. This essay, too, contains the often-quoted passage, apropos of the "introduction of Calvinism into science."

I protest that if some great Power would agree to make me always think what is true and do what is right, on condition of being turned into a sort of clock and wound up every morning before I got out of bed, I should instantly close with the offer.



The only freedom I care about is the freedom to do right; the freedom to do wrong I am ready to part with on the cheapest terms to any one who will take it of me.

This was the latest of the essays included in *Lay Sermons, Addresses and Reviews*, which came out, with a dedicatory letter to Tyndall, in the summer of 1870, and, whether on account of its subject matter or its title, always remained his most popular volume of essays.

To the same period belongs a letter to Matthew Arnold about his book *St. Paul and Protestantism*.

MY DEAR ARNOLD—Many thanks for your book which I have been diving into at odd times as leisure served, and picking up many good things.

One of the best is what you say near the end about science gradually conquering the materialism of popular religion.

It will startle the Puritans who always coolly put the matter the other way; but it is profoundly true.

These people are for the most part mere idolaters with a Bible-fetish, who urgently stand in need of conversion by Extra-christian Missionaries.

It takes all one's practical experience of the importance of Puritan ways of thinking to overcome one's feeling of the unreality of their beliefs. I had pretty well forgotten how real to them "the man in the next street" is, till your citation of their horribly absurd dogmas reminded me of it. If you can persuade them that Paul is fairly interpretable in your sense, it may be the beginning of better things, but I have my doubts if Paul would own you, if he could return to expound his own epistles.

I am glad you like my Descartes article. My business with my scientific friends is something like yours with the Puritans, nature being *our* Paul.—Ever yours very faithfully,

T. H. HUXLEY.

26 ABBEY PLACE, *May* 10, 1870.

From the 14th to the 24th of April Huxley, accompanied by his friend Hooker, made a trip to the Eifel country. His sketch-book is full of rapid sketches of the country, many of them geological; one day indeed there are eight, another nine such.

Tyndall was invited to join the party, and at first accepted, but then recollected the preliminaries which had to

be carried out before his lectures on electricity at the end of the month. So he writes on April 6:—

ROYAL INSTITUTION, 6 *April*.

MY DEAR HUXLEY—I was rendered drunk by the excess of prospective pleasure when you mentioned the Eifel yesterday, and took no account of my lectures. They begin on the 28th, and I have studiously to this hour excluded them from my thought. I have made arrangements to see various experiments involving the practical application of electricity before the lectures begin; I find myself, in short, cut off from the expedition. My regret on this score is commensurable with the pleasures I promised myself. Confound the lectures!

And yours \* on Friday is creating a pretty hubbub already. I am torn to pieces by women in search of tickets. Anything that touches progenitorship interests them. You will have a crammed house I doubt not.—Yours ever,

JOHN TYNDALL.

Huxley replied:—

GEOLOGICAL SURVEY OF ENGLAND AND WALES,  
*April 6, 1870.*

MY DEAR TYNDALL—

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T. H. H.

That's a practical application of electricity for you.

In June he writes to his wife, who had taken a sick child to the seaside:—

I hear a curious rumour (which is not for circulation), that Froude and I have been proposed for D.C.L.'s at Commemoration, and that the proposition has been bitterly and strongly opposed by Pusey.† They say there has been a regular row in

\* *On the Pedigree of the Horse*, April 8, 1870, which was never brought out in book form.

† Huxley ultimately received his D.C.L. in 1885.

Oxford about it. I suppose this is at the bottom of Jowett's not writing to me. But I hope that he won't fancy that I should be disgusted at the opposition and object to come [*i.e.* to pay his regular visit to Balliol]. On the contrary, the more complete Pusey's success, the more desirable it is that I should show my face there. Altogether it is an awkward position, as I am supposed to know nothing of what is going on.

The situation is further developed in a letter to Darwin:—

JERMYN STREET, *June 22, 1870.*

MY DEAR DARWIN—I sent the books to Queen Anne St. this morning. Pray keep them as long as you like, as I am not using them.

I am greatly disgusted that you are coming up to London this week, as we shall be out of town next Sunday. It is the rarest thing in the world for us to be away, and you have pitched upon the one day. Cannot we arrange some other day?

I wish you could have gone to Oxford, not for your sake, but for theirs. There seems to have been a tremendous shindy in the Hebdomadal board about certain persons who were proposed; and I am told that Pusey came to London to ascertain from a trustworthy friend who were the blackest heretics out of the list proposed, and that he was glad to assent to your being doctored, when he got back, in order to keep out seven devils worse than that first!

Ever, oh Coryphaeus diabolicus, your faithful follower,

T. H. HUXLEY.

The choice of a subject for his Presidential Address at the British Association for 1870, a subject which, as he put it, "has lain chiefly in a land flowing with the abominable, and peopled with mere grubs and mouldiness," was suggested by a recent controversy upon the origin of life, in which the experiments of Dr. Bastian, then Professor of Pathological Anatomy at University College, London, which seemed to prove spontaneous generation, were shown by Professor Tyndall to contain a flaw. Huxley had naturally been deeply interested from the first; he had been consulted by Dr. Bastian, and, I believe, had advised him not to publish until he had made quite sure of his ground. This question and the preparation of the course of Elementary Biol-

ogy \* led him to carry on a series of investigations lasting over two years, which took shape in a paper upon "Penicillium, Torula, and Bacterium," † first read in Section D at the British Association, 1870; and in his article on "Yeast" in the *Contemporary Review* for December 1872. He laboriously repeated Pasteur's experiments, and for years a quantity of flasks and cultures used in this work remained at South Kensington, until they were destroyed in the eighties. Of this work Sir J. Hooker writes to him:—

You have made an immense leap in the association of forms, and I cannot but suppose you approach the final solution. . . .

I have always fancied that it was rather brains and boldness, than eyes or microscopes that the mycologists wanted, and that there was more brains in Berkeley's ‡ crude discoveries than in the very best of the French and German microscopic verifications of them, who filch away the credit of them from under Berkeley's nose, and pooh-pooh his reasoning, but for which we should be, as we were.

In his Presidential Address, "Biogenesis and Abiogenesis" (*Coll. Ess.* viii. p. 229), he discussed the rival theories of spontaneous generation and the universal derivation of life from precedent life, and professed his belief, as an act of philosophic faith, that at some remote period, life had arisen out of inanimate matter, though there was no evidence that anything of the sort had occurred recently, the germ theory explaining many supposed cases of spontaneous generation. The history of the subject, indeed, showed "the great tragedy of Science—the slaying of a beautiful hypothesis by an ugly fact—which is so constantly being enacted under the eyes of philosophers," and recalled the warning "that it is one thing to refute a proposition, and another to prove the truth of a doctrine which, implicitly or explicitly, contradicts that proposition."

Two letters to Dr. Dohrn refer to this address and to the meeting of the Association.

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\* See p. 405, *sqq.* † *Quart. Journ. Micr. Sci.*, 1870, x. pp. 355-362.  
‡ Rev. W. F. Berkeley.

JERMYN STREET, *April 30, 1870.*

MY DEAR WHIRLWIND—I have received your two letters; and I was just revolving in my mind how best to meet your wishes in regard to the very important project mentioned in the first, when the second arrived and put me at rest.

I hope I need not say how heartily I enter into all your views, and how glad I shall be to see your plan for "Stations" \* carried into effect. Nothing could have a greater influence upon the progress of zoology.

A plan was set afoot here some time ago to establish a great marine Aquarium at Brighton by means of a company. They asked me to be their President, but I declined, on the ground that I did not desire to become connected with any commercial undertaking. What has become of the scheme I do not know, but I doubt whether it would be of any use to you, even if any connection could be established.

As soon as you have any statement of your project ready, send it to me and I will take care that it is brought prominently before the British public so as to stir up their minds. And then we will have a regular field-day about it in Section D at Liverpool.

Let me know your new ideas about insects and vertebrata as soon as possible, and I promise to do my best to pull them to pieces. What between Kowalewsky and his Ascidiæ, Mikluko-Maclay and his Fish-brains, and you and your Arthropods, I am becoming schwindelsüchtig, and spend my time mainly in that pious ejaculation "Donner und Blitz," in which, as you know, I seek relief. Then there is our Bastian who is making living things by the following combination:—

℞ Ammoniae Carbonatis  
Sodae Phosphatis  
Aquae destillatae  
quantum sufficit  
Caloris 150° Centigrade  
Vacui perfectissimi  
Patientiae.

Transubstantiation will be nothing to this if it turns out to be true, and you may go and tell your neighbour Januarius to shut up his shop as the heretics mean to outbid him.

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\* Dr. Dohrn succeeded in establishing such a zoological "station" at Naples.

Now I think that the best service I can render to all you enterprising young men is to turn devil's advocate, and do my best to pick holes in your work.

By the way Mikluko-Maclay \* has been here; I have seen a good deal of him, and he strikes me as a man of very considerable capacity and energy. He was to return to Jena to-day.

My friend Herbert Spencer will be glad to learn that you appreciate his book. I have been *his* devil's advocate for a number of years, and there is no telling how many brilliant speculations I have been the means of choking in an embryonic state.

My wife does not know that I am writing to you, or she would say apropos of your last paragraph that you are an entirely unreasonable creature in your notions of how friendship should be manifested, and that you make no allowances for the oppression and exhaustion of the work entailed by what Jean Paul calls a "Töchtervolles Haus." I hope I may live to see you with at least ten children, and then my wife and I will be avenged. Our children will be married and settled by that time, and we shall have time to write every day and get very wroth when you do not reply immediately.—Ever yours faithfully,

T. H. HUXLEY.

All are well, the children so grown you will not know them.

*July 18, 1870.*

MY DEAR DOHRN—Notwithstanding the severe symptoms of "Töchterkrankheit" under which I labour, I find myself equal to reply to your letter.

The British Association meets in September on the 14th day of that month, which falls on a Wednesday. Of course, if you come you shall be provided for by the best specimen of Liverpool hospitality. We have ample provision for the entertainment of the "distinguished foreigner."

Will you be so good as to be my special ambassador with Haeckel and Gegenbaur, and tell them the same thing? It would give me and all of us particular pleasure to see them and to take care of them.

But I am afraid that this wretched war will play the very deuce with our foreign friends. If you Germans do not give

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\* Mikluko-Maclay, a Russian naturalist, and close friend of Haeckel's, who later adventured himself alone among the cannibals of New Guinea.

that crowned swindler, whose fall I have been looking for ever since the *coup d'état*, such a blow as he will never recover from, I will never forgive you. Public opinion in England is not worth much, but at present, it is entirely against France. Even the *Times* which general[ly] contrives to be on the baser side of a controversy is at present on the German side. And my daughters announced to me yesterday that they had converted a young friend of theirs from the French to the German side, which is one gained for you. All look forward with great pleasure to seeing you in the autumn.—Ever yours faithfully,

T. H. HUXLEY.

In addition to this address on September 14, he read his paper on "Penicillium," etc., in Section D on the 20th. Speaking on the 17th, after a lecture of Sir J. Lubbock's on the "Social and Religious Condition of the Lower Races of Mankind," he brought forward his own experiences as to the practical results of the beliefs held by the Australian savages, and from this passed to the increasing savagery of the lower classes in great towns such as Liverpool, which was the great political question of the future, and for which the only cure lay in a proper system of education.

The savagery underlying modern civilisation was all the more vividly before him, because one evening he, together with Sir J. Lubbock, Dr. Bastian, and Mr. Samuelson, were taken by the chief of the detective department round some of the worst slums in Liverpool. In thieves' dens, doss houses, dancing saloons, enough of suffering and criminality was seen to leave a very deep and painful impression. In one of these places, a thieves' lodging-house, a drunken man with a cut face accosted him and asked him whether he was a doctor. He said "yes," whereupon the man asked him to doctor his face. He had been fighting, and was terribly excited. Huxley tried to pacify him, but if it had not been for the intervention of the detective, the man would have assaulted him. Afterwards he asked the detective if he were not afraid to go alone in these places, and got the significant answer, "Lord bless you, sir, drink and disease take all the strength out of them."

On the 21st, after the general meeting of the Association, which wound up the proceedings, the Historical Society of Lancashire and Cheshire presented a diploma of honorary membership and a gift of books to Huxley, Sir G. Stokes, and Sir J. Hooker, the last three Presidents of the British Association, and to Professors Tyndall and Rankine and Sir J. Lubbock, the lecturers at Liverpool. Then Huxley was presented with a mazer bowl lined with silver, made from part of one of the roof timbers of the cottage occupied as his headquarters by Prince Rupert during the siege of Liverpool. He was rather taken aback when he found the bowl was filled with champagne; after a moment, however, he drank "success to the good old town of Liverpool," and with a wave of his hand, threw the rest on the floor, saying, "I pour this as a libation to the tutelary deities of the town."

The same evening he was the guest of the Sphinx Club at dinner at the Royal Hotel, his friend Mr. P. H. Rathbone being in the chair, and in proposing the toast of the town and trade of Liverpool, declared that commerce was a greater civiliser than all the religion and all the science ever put together in the world, for it taught men to be truthful and punctual and precise in the execution of their engagements, and men who were truthful and punctual and precise in the execution of their engagements had put their feet upon the first rung of the ladder which led to moral and intellectual elevation.

There were the usual clerical attacks on the address, among the rest a particularly violent one from a Unitarian pulpit. Writing to Mr. Samuelson on October 5 he says:—

Be not vexed on account of the godly. They will have their way. I found Mr. ——'s sermon awaiting me on my return home. It is an able paper, but like the rest of his cloth he will not take the trouble to make himself acquainted with the ideas of the man whom he opposes. At least that is the case if he imagines he brings me under the range of his guns.

On October 2 he writes to Tyndall:—

I have not yet thanked you properly for your great contribution to the success of our meeting [*i.e.* his lecture "On the



Scientific Uses of the Imagination.”] I was nervous over the passage about the clergy, but those confounded parsons seem to me to let you say anything while they bully me for a word or a phrase. It’s the old story, “one man may steal a horse while the other may not look over the wall.”

Tyndall was not to be outdone, and replied:—

The parsons know very well that I mean kindness; if I correct them I do it in love and not in wrath.

One more extract from a letter to Dr. Dohrn, under date of November 17. The first part is taken up with a long and detailed description of the best English microscopes and their price, for Dr. Dohrn wished to get one; and my father volunteered to procure it for him. The rest of the letter has a more general interest as giving his views on the great struggle between France and Germany then in progress, his distrust of militarism, and above all, his hatred of lying, political as much as any other:—

This wretched war is doing infinite mischief, but I do not see what Germany can do now but carry it out to the end.

I began to have some sympathy with the French after Sedan, but the Republic lies harder than the Empire did, and the whole country seems to me to be rotten to the core. The only figure which stands out with anything like nobility or dignity, on the French side, is that of the Empress, and she is only a second-rate Marie-Antoinette. There is no Roland, no Corday, and apparently no *man* of any description.

The Russian row is beginning, and the rottenness of English administration will soon, I suppose, have an opportunity of displaying itself. Bad days are, I am afraid, in store for all of us, and the worst for Germany if it once becomes thoroughly bitten by the military mad dog.

The “happy family” is flourishing and was afflicted, even over its breakfast, when I gave out the news that you had been ill.

The wife desires her best remembrances, and we all hope you are better.

The high pressure under which Huxley worked, and his abundant output, continued undiminished through the autumn and winter. Indeed, he was so busy that he post-

poned his Lectures to Working Men in London from October to February 1871. On October 3 he lectured in Leicester on "What is to be Learned from a Piece of Coal," a parallel lecture to that of 1868 on "A Piece of Chalk." On the 17th and 24th he lectured at Birmingham on "Extinct Animals intermediate between Reptiles and Birds"—a subject which he had made peculiarly his own by long study; and on December 29 he was at Bradford, and lectured at the Philosophical Institute upon "The Formation of Coal" (*Coll. Ess.* viii.).

He was also busy with two Royal Commissions; still, at whatever cost of the energy and time due to his own investigations and those additional labours by which he increased his none too abundant income, he felt it his duty, in the interests of his ideal of education, to come forward as a candidate for the newly-instituted School Board for London. This was the practical outcome of the rising interest in education all over the country; on its working, he felt, depended momentous issues—the fostering of the moral and physical well-being of the nation; the quickening of its intelligence and the maintenance of its commercial supremacy. Withal, he desired to temper "book-learning" with something of the direct knowledge of nature: on the one hand, as an admirable instrument of education, if properly applied; on the other, as preparing the way for an attitude of mind which could appreciate the reasons for the immense changes already beginning to operate in human thought.

Moreover, he possessed a considerable knowledge of the working of elementary education throughout the country, owing to his experience as examiner under the Science and Art Department, the establishment of which he describes as "a measure which came into existence unnoticed, but which will, I believe, turn out to be of more importance to the welfare of the people than many political changes over which the noise of battle has rent the air" (*Scientific Education*, 1869; *Coll. Ess.* iii. p. 131).

Accordingly, though with health uncertain, and in the midst of exacting occupations, he felt that he ought not to stand aside at so critical a moment, and offered himself for

election in the Marylebone division with a secret sense that rejection would in many ways be a great relief.

The election took place on November 29, and Huxley came out second on the poll. He had had neither the means nor the time for a regular canvass of the electors. He was content to address several public meetings, and leave the result to the interest he could awaken amongst his hearers. His views were further brought before the public by the action of the editor of the *Contemporary Review*, who, before the election, "took upon himself, in what seemed to him to be the public interest," to send to the newspapers an extract from Huxley's article, "The School Boards: what they can do, and what they may do," which was to appear in the December number.

In this article will be found (*Coll. Ess.* iii. p. 374) a full account of the programme which he laid down for himself, and which to a great extent he saw carried into effect, in its fourfold division—of physical drill and discipline, not only to improve the physique of the children, but as an introduction to all other sorts of training—of domestic training, especially for girls—of education in the knowledge of moral and social laws and the engagement of the affections for what is good and against what is evil—and finally, of intellectual training. And it should be noted that he did not only regard intellectual training from the utilitarian point of view; he insisted, *c.g.* on the value of reading for amusement as "one of its most valuable uses to hard-worked people."

Much as he desired that this intellectual training should be efficient, the most cursory perusal of this article will show how far he placed the moral training above the intellectual, which, by itself, would only turn the gutter-child into "the subtlest of all the beasts of the field," and how wide of the mark is the cartoon at this period representing him as the professor whose panacea for the ragged children was to "cram them full of nonsense."

In the third section are also to be found his arguments for the retention of Bible-reading in the elementary schools. He reproached extremists of either party for confounding

the science, theology, with the affection, religion, and either crying for more theology under the name of religion, or demanding the abolition of "religious" teaching in order to get rid of theology, a step which he likens to "burning your ship to get rid of the cockroaches."

As regards his actual work on the Board, I must express my thanks to Dr. J. H. Gladstone for his kindness in supplementing my information with an account based partly on his own long experience of the Board, partly on the reminiscences of members contemporary with my father.

The Board met first on December 15, for the purpose of electing a Chairman. As a preliminary, Huxley proposed and carried a motion that no salary be attached to the post. He was himself one of the four members proposed for the Chairmanship; but the choice of the Board fell upon Lord Lawrence. In the words of Dr. Gladstone:—

Huxley at once took a prominent part in the proceedings, and continued to do so till the beginning of the year 1872, when ill-health compelled him to retire.

At first there was much curiosity both inside and outside the Board as to how Huxley would work with the old educationists, the clergy, dissenting ministers, and the miscellaneous body of eminent men that comprised the first Board. His antagonism to many of the methods employed in elementary schools was well known from his various discourses, which had been recently published together under the title of *Lay Sermons, Addresses, and Reviews*. I watched his course with interest at the time; but for the purpose of this sketch I have lately sought information from such of the old members of the Board as are still living, especially the Earl of Harrowby, Bishop Barry, the Rev. Dr. Angus, and Mr. Edward North Buxton, together with Mr. Croad, the Clerk of the Board. They soon found proof of his great energy, and his power of expressing his views in clear and forcible language; but they also found that with all his strong convictions and lofty ideals he was able and willing to enter into the views of others, and to look at a practical question from its several sides. He could construct as well as criticise. Having entered a public arena somewhat late in life, and being of a sensitive nature, he had scarcely acquired that calmness and pachydermatous quality which is needful for one's personal

comfort; but his colleagues soon came to respect him as a perfectly honest antagonist or supporter, and one who did not allow differences of conviction to interfere with friendly intercourse.

The various sections of the clerical party indeed looked forward with great apprehension to his presence on the Board, but the more liberal amongst them ventured to find ground for hoping that they and he would not be utterly opposed so far as the work of practical organisation was concerned, in the declaration of his belief that true education was impossible without "religion," of which he declared that all that has an unchangeable reality in it is constituted by the love of some ethical ideal to govern and guide conduct, "together with the awe and reverence, which have no kinship with base fear, but rise whenever one tries to pierce below the surface of things, whether they be material or spiritual." And in fact a cleavage took place between him and the seven extreme "secularists" on the Board (the seven champions of unchristendom, as their opponents dubbed them) on the question of the reading of the Bible in schools (see below, p. 367).\*

One of the earliest proposals laid before the Board was a resolution to open the meetings with prayer. To this considerable opposition was offered; but a bitter debate was averted by Huxley pointing out that the proposal was *ultra vires*, inasmuch as under the Act constituting the Board the business for which they were empowered to meet did not include prayer. Hereupon a requisition—in which he himself joined—was made to allow the use of a committee-room to those who wished to unite in a short service before the weekly meetings, an arrangement which has continued to the present time.

At the second meeting, on December 21, he gave notice of a motion to appoint a committee to consider and report

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\* Bishop Barry calls particular attention to his attitude on this point, "because," he says, "it is (I think) often misunderstood. In the *Life* (for instance) of the *Right Honourable W. H. Smith*, published not long ago, Huxley is supposed, as a matter of course, to have been the leader of the Secularist party."

upon the scheme of education to be adopted in the Board Schools.

This motion came up for consideration on February 15, 1871. In introducing it, he said that such a committee ought to consider—

First, the general nature and relations of the schools which may come under the Board. Secondly, the amount of time to be devoted to educational purposes in such schools; and Thirdly, the subject-matter of the instruction or education, or teaching, or training, which is to be given in these schools.

But this, by itself, he continued, would be incomplete. At one end of the scale he advocated Infant schools, and urged a connection with the excellent work of the Ragged schools. At the other end he desired to see continuation schools, and ultimately some scheme of technical education. A comprehensive scheme, indeed, would involve an educational ladder from the gutter to the university, whereby children of exceptional ability might reach the place for which nature had fitted them.

The subject matter of elementary instruction must be limited by what was practicable and desirable. The revised code had done too little; it had taught the use of the tools of learning, while denying all sorts of knowledge on which to exercise them afterwards. And here incidentally he repudiated the notion that the English child was stupid; on the contrary, he thought the two finest intellects in Europe at this time were the English and the Italian.

In particular he advocated the teaching of "the first elements of physical science"; "by which I do not mean teaching astronomy and the use of the globes, and the rest of the abominable trash—but a little instruction of the child in what is the nature of common things about him; what their properties are, and in what relation this actual body of man stands to the universe outside of it." "There is no form of knowledge or instruction in which children take greater interest."

Drawing and music, too, he considered, should be taught in every elementary school, not to produce painters or

musicians, but as civilising arts. History, except the most elementary notions, he put out of court, as too advanced for children.

Finally, he proposed a list of members to serve on the Education Committee in a couple of sentences with a humorous twist in them which disarmed criticism. "On a former occasion I was accused of having a proclivity in favour of the clergy, and recollecting this, I have only given them in this instance a fair proportion of the representation. If, however, I have omitted any gentleman who thinks he ought to be on the committee, I can only assure him that above all others I should have been glad to put him on."

That day week the committee was elected, about a third of the members of the Board being chosen to serve on it. At the same meeting, Dr. Gladstone continues—

Mr. W. H. Smith, the well-known member of Parliament, proposed, and Mr. Samuel Morley, M.P., seconded, a resolution in favour of religious teaching—"That, in the schools provided by the Board, the Bible shall be read, and there shall be given therefrom such explanations and such instruction in the principles of religion and morality as are suited to the capacities of children," with certain provisos. Several antagonistic amendments were proposed; but Prof. Huxley gave his support to Mr. Smith's resolutions, which, however, he thought might be trimmed and amended in a way that the Rev. Dr. Angus had suggested. His speech, defining his own position, was a very remarkable one. He said it was assumed in the public mind that this question of religious instruction was a little family quarrel between the different sects of Protestantism on the one hand, and the old Catholic Church on the other. Side by side with this much shivered and splintered Protestantism of theirs, and with the united fabric of the Catholic Church (not so strong temporally as she used to be, otherwise he might not have been addressing them at that moment) there was a third party growing up into very considerable and daily increasing significance, which had nothing to do with either of those great parties, and which was pushing its own way independent of them, having its own religion and its own morality, which rested in no way whatever on the foundations of the other two." He thought that "the action of the Board should be guided and influenced very much by the consideration of this third great aspect of

things," which he called the scientific aspect, for want of a better name.

"It had been very justly said that they had a great mass of low half-instructed population which owed what little redemption from ignorance and barbarism it possessed mainly to the efforts of the clergy of the different denominations. Any system of gaining the attention of these people to these matters must be a system connected with, or not too rudely divorced from their own system of belief. He wanted regulations, not in accordance with what he himself thought was right, but in the direction in which thought was moving." He wanted an elastic system, that did not oppose any obstacle to the free play of the public mind.

Huxley voted against all the proposed amendments, and in favour of Mr. Smith's motion. There were only three who voted against it; while the three Roman Catholic members refrained from voting. This basis of religious instruction, practically unaltered, has remained the law of the Board ever since.

There was a controversy in the papers, between Prof. Huxley and the Rev. W. H. Freemantle, as to the nature of the explanations of the Bible lessons. Huxley maintained that it should be purely grammatical, geographical, and historical in its nature; Freemantle that it should include some species of distinct religious teaching, but not of a denominational character.\*

In taking up this position, Huxley expressly disclaimed any desire for a mere compromise to smooth over a difficulty. He supported what appeared to be the only workable plan under the circumstances, though it was not his ideal; for he would not have used the Bible as the agency for introducing the religious and ethical idea into education if he had been dealing with a fresh and untouched population.

His appreciation of the literary and historical value of the Bible, and the effect it was likely to produce upon the

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\* Cp. extract from Lord Shaftesbury's journal about this correspondence (*Life and Work of Lord Shaftesbury*, iii. 282). "Professor Huxley has this definition of morality and religion: 'Teach a child what is wise, that is *morality*. Teach him what is wise and beautiful, that is *religion*!' Let no one henceforth despair of making things clear and of giving explanations!"



school children, circumstanced as they were, is sometimes misunderstood to be an endorsement of the vulgar idea of it. But it always remained his belief "that the principle of strict secularity in State education is sound, and must eventually prevail."\*

His views on dogmatic teaching in State schools, may be gathered further from two letters at the period when an attempt was being made to upset the so-called compromise.

The first appeared in the *Times* of April 29, 1893:—

SIR—In a leading article of your issue of to-day you state, with perfect accuracy, that I supported the arrangement respecting religious instruction agreed to by the London School Board in 1871, and hitherto undisturbed. But you go on to say that "the persons who framed the rule" intended it to include definite teaching of such theological dogmas as the Incarnation.

I cannot say what may have been in the minds of the framers of the rule; but, assuredly, if I had dreamed that any such interpretation could fairly be put upon it, I should have opposed the arrangement to the best of my ability.

In fact, a year before the rule was framed I wrote an article in the *Contemporary Review*, entitled "The School Boards—what they can do and what they may do," in which I argued that the terms of the Education Act excluded such teaching as it is now proposed to include. And I support my contention by the following citation from a speech delivered by Mr. Forster at the Birkbeck Institution in 1870:—

I have the fullest confidence that in the reading and explaining of the Bible what the children will be taught will be the great truths of Christian life and conduct, which all of us desire they should know, and that no efforts will be made to cram into their poor little minds theological dogmas which their tender age prevents them from understanding.—I am, Sir, your obedient servant,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *April 28.*

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\* As a result of some remarks of Mr. Clodd's on the matter in *Pioneers of Evolution*, a correspondent, some time after, wrote to him as follows:

"In the report upon State Education in New Zealand, 1895, drawn up by R. Laishly, the following occurs, p. 13:—'Professor Huxley gives me leave to state his opinion to be that the principle of strict secularity in State education is sound, and must eventually prevail.'"

The second is to a correspondent who wrote to ask him whether adhesion to the compromise had not rendered nonsensical the teaching given in a certain lesson upon the finding of the youthful Jesus in the temple, when, after they had read the verse, "How is it that ye sought me? Wist ye not that I must be about my Father's business?" the teacher asked the children the name of Jesus' father and mother, and accepted the simple answer, Joseph and Mary. Thus the point of the story, whether regarded as reality or myth, is slurred over, the result is perplexity, the teaching, in short, is bad, apart from all theory as to the value of the Bible.

In a letter to the *Chronicle*, which he forwarded, this correspondent suggested a continuation of the "incriminated lesson":—

Suppose, then, that an intelligent child of seven, who has just heard it read out that Jesus excused Himself to His parents for disappearing for three days, on the ground that He was about His Father's business, and has then learned that His father's name was Joseph, had said "Please, teacher, was this the Jesus that gave us the Lord's Prayer?" The teacher answers "Yes." And suppose the child rejoins, "And is it to His father Joseph that he bids us pray when we say Our Father?" But there are boys of nine, ten, eleven years in Board schools, and many such boys are intelligent enough to take up the subject of the lesson where the instructor left it. "Please, teacher," asks one of these, "what business was it that Jesus had to do for His father Joseph? Had he stopped behind to get a few orders? Was it true that He had been about Joseph's business? And, if it was not true, did He not deserve to be punished?"

Huxley replied on October 16, 1894:—

DEAR SIR—I am one with you in hating "hush up" as I do all other forms of lying; but I venture to submit that the compromise of 1871 was not a "hush-up." If I had taken it to be such I should have refused to have anything to do with it. And more specifically, I said in a letter to the *Times* (see *Times*, 29th April 1893) at the beginning of the present controversy, that if I had thought the compromise involved the obligatory teaching of such dogmas as the Incarnation I should have opposed it.

There has never been the slightest ambiguity about my posi-

tion in this matter; in fact, if you will turn to one paper on the School Board written by me before my election in 1870, I think you will find that I anticipated the pith of the present discussion.

The persons who agreed to the compromise, did exactly what all sincere men who agree to compromise, do. For the sake of the enormous advantage of giving the rudiments of a decent education to several generations of the people, they accepted what was practically an armistice in respect of certain matters about which the contending parties were absolutely irreconcilable.

The clericals have now "denounced" the treaty, doubtless thinking they can get a new one more favourable to themselves.

From my point of view, I am not sure that it might not be well for them to succeed, so that the sweep into space which would befall them in the course of the next twenty-three years might be complete and final.

As to the case you put to me—permit me to continue the dialogue in another shape.

*Boy.*—Please, teacher, if Joseph was not Jesus' father and God was, why did Mary say, "Thy father and I have sought thee sorrowing"? How could God not know where Jesus was? How could He be sorry?

*Teacher.*—When Jesus says Father, he means God; but when Mary says father, she means Joseph.

*Boy.*—Then Mary didn't know God was Jesus' father?

*Teacher.*—Oh, yes, she did (reads the story of the Annunciation).

*Boy.*—It seems to me very odd that Mary used language which she knew was not true, and taught her son to call Joseph father. But there's another odd thing about her. If she knew her child was God's son, why was she alarmed about his safety? Surely she might have trusted God to look after his own son in a crowd.

I know of children of six and seven who are quite capable of following out such a line of inquiry with all the severe logic of a moral sense which has not been sophisticated by pious scrubbing.

I could tell you of stranger inquiries than these which have been made by children in endeavouring to understand the account of the miraculous conception.

Whence I conclude that even in the interests of what people are pleased to call Christianity (though it is my firm conviction that Jesus would have repudiated the doctrine of

the Incarnation as warmly as that of the Trinity), it may be well to leave things as they are.

All this is for your own eye. There is nothing in substance that I have not said publicly, but I do not feel called upon to say it over again, or get mixed up in an utterly wearisome controversy.—I am, yours faithfully,  
T. H. HUXLEY.

However, he was unsuccessful in his proposal that a selection be made of passages for reading from the Bible; the Board refused to become censors. On May 10 he raised the question of the diversion from the education of poor children of charitable bequests, which ought to be applied to the augmentation of the school fund. In speaking to this motion he said that the long account of errors and crimes of the Catholic Church was greatly redeemed by the fact that that Church had always borne in mind the education of the poor, and had carried out the great democratic idea that the soul of every man was of the same value in the eyes of his Maker.

The next matter of importance in which he took part was on June 14, when the Committee on the Scheme of Education presented its first report. Dr. Gladstone writes:—

It was a very voluminous document. The Committee had met every week, and, in the words of Huxley, "what it had endeavoured to do, was to obtain some order and system and uniformity in important matters, whilst in comparatively unimportant matters they thought some play should be given for the activity of the bodies of men into whose hands the management of the various schools should be placed." The recommendations were considered on June 21 and July 12, and passed without any material alterations or additions. They were very much the same as existed in the best elementary schools of the period. Huxley's chief interest, it may be surmised, was in the subjects of instruction. It was passed that, in infants' schools there should be the Bible, reading, writing, arithmetic, object lessons of a simple character, with some such exercise of the hands and eyes as is given in the Kindergarten system, music, and drill. In junior and senior schools the subjects of instruction were divided into two classes, essential and discretionary, the essentials being the Bible, and the principles of religion and

morality, reading, writing, and arithmetic, English grammar and composition, elementary geography, and elementary social economy, history of England, the principles of book-keeping in senior schools, with mensuration in senior boys' schools. All through the six years there were to be systematised object lessons, embracing a course of elementary instruction in physical science, and serving as an introduction to the science examinations conducted by the Science and Art Department. An analogous course of instruction was adopted for elementary evening schools. In moving "that the formation of science and art classes in connection with public elementary schools be encouraged and facilitated," Huxley contended strongly for it, saying, "The country could not possibly commit a greater error than in establishing schools in which the direct applications of science and art were taught before those who entered the classes were grounded in the principles of physical science." In advocating object lessons he said, "The position that science was now assuming, not only in relation to practical life, but to thought, was such that those who remained entirely ignorant of even its elementary facts were in a wholly unfair position as regarded the world of thought and the world of practical life." It was, moreover, "the only real foundation for technical education."

Other points in which he was specially concerned were, that the universal teaching of drawing was accepted, against an amendment excluding girls; that domestic economy was made a discretionary substitute for needlework and cutting-out; while he spoke in defence of Latin as a discretionary subject, alternatively with a modern language. It was true that he would not have proposed it in the first instance, not because a little Latin is a bad thing, but for fear of "overloading the boat." But, on the other hand, there was great danger if education were not thrown open to all without restriction. If it be urged that a man should be content with the state of life to which he is called, the obvious retort is, How do you know what is your state of life, unless you try what you are called to? There is no more frightful "sitting on the safety valve" than in preventing men of ability from having the means of rising to the positions for which they, by their talents and industry, could qualify themselves.

Further, although the committee as a whole recommended that discretionary subjects should be extras, he wished them to be covered by the general payment, in which sense the report was amended.

This Education Committee (proceeds Dr. Gladstone) continued to sit, and on November 30 brought up a report in favour of the Prussian system of separate class-rooms, to be tried in one school as an experiment. This reads curiously now that it has become the system almost universally adopted in the London Board Schools.

In regard to examinations Huxley strongly supported the view that the teaching in all subjects, secular or sacred, should be periodically tested.

On December 13, Huxley raised the question whether the selection of books and apparatus should be referred to his Committee or to the School Management Committee, and on January 10 following, a small sub-committee for that object was formed. Almost immediately after this he retired from the Board.

One more speech of his, which created a great stir at the time, must be referred to, namely his expression of undisguised hostility to the system of education maintained by the Ultramontane section of the Roman Catholics.\* In October the bye-laws came up for consideration. One of them provided that the Board should pay over direct to denominational schools the fees for poor children. This he opposed on the ground that it would lead to repeated contests on the Board, and further, might be used as a tool by the Ultramontanes for their own purposes. Believing that their system as set forth in the syllabus, of securing complete possession of the minds of those whom they taught or controlled, was destructive to all that was highest in the nature of mankind, and inconsistent with intellectual and political liberty, he considered it his earnest duty to oppose all measures which would lead to assisting the Ultramontanes in their purpose.

Hereupon he was vehemently attacked, for example, in the *Times* for his "injudicious and even reprehensible tone"

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\* Cp. "Scientific Education," *Coll. Ess.* iii. p. 111.

which "aggravated the difficulties his opponents might have in giving way to him." Was this, it was asked, the way to get Roman Catholic children to the Board schools? Was it not an abandonment of the ideal of compulsory education?

It is hardly necessary to point out that the question was not between the compulsory inclusion or exclusion of poor children, but between their admission at the cost of the Board to schools under the Board's own control or outside it. In any case the children of Roman Catholics were not likely to get their own doctrines taught in Board Schools, and without this they declared they would rather go without education at all.

Early in 1872 Huxley retired. For a year he had continued at this task; then his health broke down, and feeling that he had done his part, from no personal motives of ambition, but rather at some cost to himself, for what he held to be national ends, he determined not to resume the work after the rest which was to restore him to health, and made his resignation definite.

Dr. Gladstone writes:—

On February 7 a letter of resignation was received from him, stating that he was "reluctantly compelled, both on account of his health and his private affairs, to insist on giving up his seat at the Board." The Rev. Dr. Rigg, Canon Miller, Mr. Charles Read, and Lord Lawrence expressed their deep regret. In the words of Dr. Rigg, "they were losing one of the most valuable members of the Board, not only because of his intellect and trained acuteness, but because of his knowledge of every subject connected with culture and education, and because of his great fairness and impartiality with regard to all subjects that came under his observation."

Though Huxley quitted the Board after only fourteen months' service, the memory of his words and acts combined to influence it long afterwards. In various ways he expressed his opinion on educational matters, publicly and privately. He frequently talked with me on the subject at the Athenæum Club, and shortly after my election to the Board in 1873, I find it recorded in my diary that he insisted strongly on the necessity of our building infants' schools,—“people may talk about intel-

lectual teaching, but what we principally want is the moral teaching."

As to the sub-committee on books and apparatus, it did little at first, but at the beginning of the second Board, 1873, it became better organised under the presidency of the Rev. Benjamin Waugh. At the commencement of the next triennial term I became the chairman, and continued to be such for eighteen years. It was our duty to put into practice the scheme of instruction which Huxley was mainly instrumental in settling. We were thus able indirectly to improve both the means and methods of teaching. The subjects of instruction have all been retained in the Curriculum of the London School Board, except, perhaps, "mensuration" and "social economy." The most important developments and additions have been in the direction of educating the hand and eye. Kindergarten methods have been promoted. Drawing, on which Huxley laid more stress than his colleagues generally did, has been enormously extended and greatly revolutionised in its methods. Object lessons and elementary science have been introduced everywhere, while shorthand, the use of tools for boys, and cookery and domestic economy for girls are becoming essentials in our schools. Evening continuation schools have lately been widely extended. Thus the impulse given by Huxley in the first months of the Board's existence has been carried forward by others, and is now affecting the minds of the half million of boys and girls in the Board Schools of London, and indirectly the still greater number in other schools throughout the land.

I must further express my thanks to Bishop Barry for permission to make use of the following passages from the notes contributed by him to Dr. Gladstone:—

I had the privilege of being a member of his committee for defining the curriculum of study, and here also—the religious question being disposed of—I was able to follow much the same line as his, and I remember being struck not only with his clear-headed ability, but with his strong commonsense, as to what was useful and practicable, and the utter absence in him of *doctrinaire* aspiration after ideal impossibilities. There was (I think) very little under his chairmanship of strongly accentuated difference of opinion.

In his action on the Board generally I was struck with these three characteristics:—First, his remarkable power of speaking



—I may say, of oratory—not only on his own scientific subjects, but on all the matters, many of which were of great practical interest and touched the deepest feelings, which came before the Board at that critical time. Had he chosen—and we heard at that time that he was considering whether he should choose—to enter political life, it would certainly have made him a great power, possibly a leader, in that sphere. Next, what constantly appears in his writings, even those of the most polemical kind—a singular candour in recognising truths which might seem to militate against his own position, and a power of understanding and respecting his adversaries' opinions, if only they were strongly and conscientiously held. I remember his saying on one occasion that in his earlier experience of sickness and suffering, he had found that the most effective helpers of the higher humanity were not the scientist or the philosopher, but “the parson, and the sister, and the Bible woman.” Lastly, the strong commonsense, which enabled him to see what was “within the range of practical politics,” and to choose for the cause which he had at heart the line of least resistance, and to check, sometimes to rebuke, intolerant obstinacy even on the side which he was himself inclined to favour. These qualities over and above his high intellectual ability made him, for the comparatively short time that he remained on the Board, one of its leading members.

No less vivid is the impression left, after many years, upon another member of the first School Board, the Rev. Benjamin Waugh, whose life-long work for the children is so well known. From his recollections, written for the use of Professor Gladstone, it is my privilege to quote the following paragraphs:—

I was drawn to him most, and was influenced by him most, because of his attitude to a child. He was on the Board to establish schools for children. His motive in every argument, in all the fun and ridicule he indulged in, and in his occasional anger, was the child. He resented the idea that schools were to train either congregations for churches or hands for factories. He was on the Board as a friend of children. What he sought to do for the child was for the child's sake, that it might live a fuller, truer, worthier life. If ever his great tolerance with men with whom he differed on general principles seemed to fail him for a moment, it was because they seemed to him to seek other ends than the child for its own sake. . . .

His contempt for the idea of the world into which we were born being either a sort of clergyhouse or a market-place, was too complete to be marked by any eagerness. But in view of the market-place idea he was the less calm.

Like many others who had not yet come to know in what high esteem he held the moral and spiritual nature of children, I had thought he was the advocate of mere secular studies, alike in the nation's schools, and in its families. But by contact with him, this soon became an impossible idea. In very early days on the Board a remark I had made to a mutual friend which implied this unjust idea was repeated to him. "Tell Waugh that he talks too fast," was his message to me. I was not long in finding out that this was a very just reproof. . . .

The two things in his character of which I became most conscious by contact with him, were his childlikeness and his consideration for intellectual inferiors. His arguments were as transparently honest as the arguments of a child. They might or might not seem wrong to others, but they were never untrue to himself. Whether you agreed with them or not, they always added greatly to the charm of his personality. Whether his face was lighted by his careless and playful humour or his great brows were shadowed by anger, he was alike expressing himself with the honesty of a child. What he counted iniquity he hated, and what he counted righteous he loved with the candour of a child. . . .

Of his consideration for intellectual inferiors I, of course, needed a large share, and it was never wanting. Towering as was his intellectual strength and keenness above me, indeed above the whole of the rest of the members of the Board, he did not condescend to me. The result was never humiliating. It had no pain of any sort in it. He was too spontaneous and liberal with his consideration to seem conscious that he was showing any. There were many men of religious note upon the Board, of some of whom I could not say the same.

In his most trenchant attacks on what he deemed wrong in principles, he never descended to attack either the sects which held them or the individuals who supported them, even though occasionally much provocation was given him. He might not care for peace with some of the theories represented on the Board, but he had certainly and at all times great good-will to men.

As a speaker he was delightful. Few, clear, definite, and calm as stars were the words he spoke. Nobody talked whilst

he was speaking. There were no tricks in his talk. He did not seem to be trying to persuade you of something. What convinced him, that he transferred to others. He made no attempt to misrepresent those opposed to him. He sought only to let them know himself. . . . Even the sparkle of his humour, like the sparkle of a diamond, was of the inevitable in him, and was as fair as it was enjoyable.

As one who has tried to serve children, I look back upon having fallen in with Mr. Huxley as one of the many fortunate circumstances of my life. It taught me the importance of making acquaintance with facts, and of studying the laws of them. Under his influence it was that I most of all came to see the practical value of a single eye to those in any pursuit of life. I saw what effect they had on emotions of charity and sentiments of justice, and what simplicity and grandeur they gave to appeals.

My last conversation with him was at Eastbourne some time in 1887 or 1888. I was there on my society's business. "Well, Waugh, you're still busy about your babies," was his greeting. "Yes," I responded, "and you are still busy about your pigs." One of the last discussions at which he was present at the School Board for London had been on the proximity of a piggery to a site for a school, and his attack on Mr. Gladstone on the Gadarene swine had just been made in the *Nineteenth Century*. "Do you still believe in Gladstone?" he continued. "That man has the greatest intellect in Europe. He was born to be a leader of men, and he has debased himself to be a follower of the masses. If working men were to-day to vote by a majority that two and two made five, to-morrow Gladstone would believe it, and find them reasons for it which they had never dreamed of." He said it slowly and with sorrow.

Two more incidents are connected with his service on the School Board. A wealthy friend wrote to him in the most honourable and delicate terms, begging him, on public grounds, to accept £400 a year to enable him to continue his work on the Board. He refused the offer as simply and straightforwardly as it was made; his means, though not large, were sufficient for his present needs.

Further, a good many people seemed to think that he meant to use the School Board as a stalking horse for a

political career. To one of those who urged him to stand for Parliament, he replied thus:—

*Nov. 18, 1871.*

DEAR SIR—It has often been suggested to me that I should seek for a seat in the House of Commons; indeed I have reason to think that many persons suppose that I entered the London School Board simply as a road to Parliament.

But I assure you that this supposition is entirely without foundation, and that I have never seriously entertained any notion of the kind.

The work of the School Board involves me in no small sacrifices of various kinds, but I went into it with my eyes open, and with the clear conviction that it was worth while to make those sacrifices for the sake of helping the Education Act into practical operation. A year's experience has not altered that conviction; but now that the most difficult, if not the most important, part of our work is done, I begin to look forward with some anxiety to the time when I shall be relieved of duties which so seriously interfere with what I regard as my proper occupation.

No one can say what the future has in store for him, but at present I know of no inducement, not even the offer of a seat in the House of Commons, which would lead me, even temporarily and partially, to forsake that work again.—I am, dear sir, yours very faithfully,

T. H. HUXLEY.

I give here a letter to me from Sir Mountstuart Grant Duff, who also at one period was anxious to induce him to enter Parliament:—

LEXDEN PARK, COLCHESTER,  
*4th November 1898.*

DEAR MR. HUXLEY—I have met men who seemed to me to possess powers of mind even greater than those of your father—his friend Henry Smith for example; but I never met any one who gave me the impression so much as he did, that he would have gone to the front in any pursuit in which he had seen fit to engage. Henry Smith had, in addition to his astonishing mathematical genius, and his great talents as a scholar, a rare faculty of persuasiveness. Your father used to speak with much admiration and some amusement of the way in which he managed to get people to take his view by appearing to take theirs; but he never could have been a power in a popular assembly, nor have carried with him by the force of his eloquence,

great masses of men. I do not think that your father, if he had entered the House of Commons and thrown himself entirely into political life, would have been much behind Gladstone as a debater, or Bright as an orator. Whether he had the *stamina* which are required not only to reach but to retain a foremost place in politics, is another question. The admirers of Prince Bismarck would say that the daily prayer of the statesman should be for "une bonne digestion et un mauvais cœur." "Le mauvais cœur" does not appear to be "de toute nécessité," but, assuredly, the "bonne digestion" is. Given an adequate and equal amount of ability in two men who enter the House of Commons together, it is the man of strong digestion, drawing with it, as it usually does, good temper and power of continuous application, who will go furthest. Gladstone, who was inferior to your father in intellect, might have "given points" to the Dragon of Wantley who devoured church steeples. Your father could certainly not have done so, and in that respect was less well equipped for a life-long parliamentary struggle.

I should like to have seen these two pitted against each other with that "substantial piece of furniture" between them behind which Mr. Disraeli was glad to shelter himself. I should like to have heard them discussing some subject which they both thoroughly understood. When they did cross swords the contest was like nothing that has happened in our times save the struggle at Omdurman. It was not so much a battle as a massacre, for Gladstone had nothing but a bundle of antiquated prejudices wherewith to encounter your father's luminous thought and exact knowledge.

You know, I daresay, that Mr. William Rathbone, then M.P. for Liverpool, once proposed to your father to be the companion of my first Indian journey in 1874-5, he, William Rathbone, paying all your father's expenses.\* Mr. Rathbone made this proposal when he found that Lubbock, with whom I travelled a great deal at that period of my life, was unable to go with me to India. How I wish your father had said "Yes." My journey, as it was, turned out most instructive and delightful; but to have lived five months with a man of his ex-

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\* Of this, Dr. Tyndall wrote to Mrs. Huxley:—"I want to tell you a pleasant conversation I had last night with Jodrell. He and a couple more want to send Hal with Grant Duff to India, taking charge of his duties here and of all necessities ghostly and bodily there!"

traordinary gifts would have been indeed a rare piece of good fortune, and I should have been able also to have contributed to the work upon which you are engaged a great many facts which would have been of interest to your readers. You will, however, I am sure, take the will for the deed, and believe me, very sincerely yours,

M. E. GRANT DUFF.

## CHAPTER XXV

1871

“IN 1871” (to quote Sir M. Foster), “the post of Secretary to the Royal Society became vacant through the resignation of William Sharpey, and the Fellows learned with glad surprise that Huxley, whom they looked to rather as a not distant President, was willing to undertake the duties of the office.” This office, which he held until 1880, involved him for the next ten years in a quantity of anxious work, not only in the way of correspondence and administration, but the seeing through the press and often revising every biological paper that the Society received, as well as reading those it rejected. Then, too, he had to attend every general, council, and committee meeting, amongst which latter the *Challenger* Committee was a load in itself. Under pressure of all this work, he was compelled to give up active connection with other learned societies.\*

Other work this year, in addition to the School Board, included courses of lectures at the London Institution in January and February, on “First Principles of Biology,” and from October to December on “Elementary Physiology”; lectures to Working Men in London from February to April, as well as one at Liverpool, March 25, on “The Geographical Distribution of Animals”; two lectures at the Royal Institution, May 12 and 19, on “Berkeley on Vision,” and the “Metaphysics of Sensation” (*Coll. Ess.* vi.). He published one paleontological paper, “Fossil Vertebrates from the Yarrow Colliery” (Huxley and Wright, *Irish Acad. Trans.*). In June and July he gave 36 lectures to

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\* See Appendix II.

schoolmasters—that important business of teaching the teachers that they might set about scientific instruction in the right way.\* He attended the British Association at Edinburgh, and laid down his Presidency; he brought out his “Manual of Vertebrate Anatomy,” and wrote a review of “Mr. Darwin’s Critics” (*see* p. 391, *sq.*), while on October 9 he delivered an address at the Midland Institute, Birmingham, on “Administrative Nihilism” (*Coll. Ess.* i.). This address, written between September 21 and 28, and remodelled later, was a pendant to his educational campaign on the School Board; a re-statement and justification of what he had said and done there. His text was the various objections raised to State interference with education; he dealt first with the upholders of a kind of caste system, men who were willing enough to raise themselves and their sons to a higher social plane, but objected on semi-theological grounds to anyone from below doing likewise—neatly satirising them and their notions of gentility, and quoting Plato in support of his contention that what is wanted even more than means to help capacity to rise is “machinery by which to facilitate the descent of incapacity from the higher strata to the lower.” He repeats in new phrase his warning “that every man of high natural ability, who is both ignorant and miserable, is as great a danger to society as a rocket without a stick is to people who fire it. Misery is a match that never goes out; genius, as an explosive power, beats gunpowder hollow: and if knowledge, which should give that power guidance, is wanting, the chances are not small that the rocket will simply run a-muck among friends and foes.”

Another class of objectors will have it that government should be restricted to police functions, both domestic and foreign, that any further interference must do harm.

Suppose, however, for the sake of argument, that we accept the proposition that the functions of the State may be properly summed up in the one great negative commandment—“Thou shalt not allow any man to interfere with the liberty of any

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\* See pp. 389, 405, *sq.*



other man,"—I am unable to see that the logical consequence is any such restriction of the power of Government, as its supporters imply. If my next-door neighbour chooses to have his drains in such a state as to create a poisonous atmosphere, which I breathe at the risk of typhoid and diphtheria, he restricts my just freedom to live just as much as if he went about with a pistol threatening my life; if he is to be allowed to let his children go unvaccinated, he might as well be allowed to leave strychnine lozenges about in the way of mine; and if he brings them up untaught and untrained to earn their living, he is doing his best to restrict my freedom, by increasing the burden of taxation for the support of gaols and workhouses, which I have to pay.

The higher the state of civilisation, the more completely do the actions of one member of the social body influence all the rest, and the less possible is it for any one man to do a wrong thing without interfering, more or less, with the freedom of all his fellow-citizens. So that, even upon the narrowest view of the functions of the State, it must be admitted to have wider powers than the advocates of the police theory are disposed to admit.

This leads to a criticism of Mr. Spencer's elaborate comparison of the body politic to the body physical, a comparison vitiated by the fact that "among the higher physiological organisms there is none which is developed by the conjunction of a number of primitively independent existences into a complete whole."

The process of social organisation appears to be comparable, not so much to the process of organic development, as to the synthesis of the chemist, by which independent elements are gradually built up into complex aggregations—in which each element retains an independent individuality, though held in subordination to the whole.

It is permissible to quote a few more sentences from this address for the sake of their freshness, or as illustrating the writer's ideas.

Discussing toleration, "I cannot discover that Locke fathers the pet doctrine of modern Liberalism, that the toleration of error is a good thing in itself, and to be reckoned among the cardinal virtues." \*

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\* This bears on his speech against Ultramontaniam. See p. 374.

Of Mr. Spencer's comparison of the State to a living body in the interests of individualism:—

I suppose it is universally agreed that it would be useless and absurd for the State to attempt to promote friendship and sympathy between man and man directly. But I see no reason why, if it be otherwise expedient, the State may not do something towards that end indirectly. For example, I can conceive the existence of an Established Church which should be a blessing to the community. A Church in which, week by week, services should be devoted, not to the iteration of abstract propositions in theology, but to the setting before men's minds of an ideal of true, just, and pure living; a place in which those who are weary of the burden of daily cares should find a moment's rest in the contemplation of the higher life which is possible for all, though attained by so few; a place in which the man of strife and of business should have time to think how small, after all, are the rewards he covets compared with peace and charity. Depend upon it, if such a Church existed, no one would seek to disestablish it.

The sole order of nobility which, in my judgment, becomes a philosopher, is the rank which he holds in the estimation of his fellow-workers, who are the only competent judges in such matters. Newton and Cuvier lowered themselves when the one accepted an idle knighthood, and the other became a baron of the empire. The great men who went to their graves as Michael Faraday and George Grote seem to me to have understood the dignity of knowledge better when they declined all such meretricious trappings.\*

The usual note of high pressure recurs in the following letter, written to thank Darwin for his new work, *The Descent of Man, and Sexual Selection*.

JERMYN STREET, Feb. 20, 1871.

MY DEAR DARWIN—Best thanks for your new book, a copy of which I find awaiting me this morning. But I wish you would not bring your books out when I am so busy with all sorts of things. You know I can't show my face anywhere in society without having read them—and I consider it too bad.

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\* On the other hand, he thought it right and proper for officials, in scientific as in other departments, to accept such honours, as giving them official power and status. In his own case, while refusing all

No doubt, too, it is full of suggestions just like that I have hit upon by chance at p. 212 of vol. i., which connects the periodicity of vital phenomena with antecedent conditions.

Fancy lunacy, &c., coming out of the primary fact that one's *n*th ancestor lived between tide-marks! I declare it's the grandest suggestion I have heard of for an age.

I have been working like a horse for the last fortnight, with the fag end of influenza hanging about me—and I am improving under the process, which shows what a good tonic work is.

I shall try if I can't pick out from "Sexual Selection" some practical hint for the improvement of gutter-babies, and bring in a resolution thereupon at the School Board.—Ever yours faithfully,

T. H. HUXLEY.

This year also saw the inception of a scheme for a series of science primers, under the joint editorship of Professors Huxley, Roscoe, and Balfour Stewart. Huxley undertook the Introductory Primer, but it progressed slowly owing to pressure of other work, and was not actually finished till 1880.

26 ABBEY PLACE, *June 29, 1871.*

MY DEAR ROSCOE—If you could see the minutes of the Proceedings of the Aid to Science Commission, the Contagious Diseases Commission and the School Board (to say nothing of a lecture to Schoolmasters every morning) you would forgive me for not having written to you before.

But now that I have had a little time to look at it, I hasten to say that your chemical primer appears to me to be admirable—just what is wanted.

I enclose the sketch for my Primer *primus*. You will see the bearing of it, rough as it is. When it touches upon chemical matters, it would deal with them in a more rudimentary fashion than yours does, and only prepare the minds of the fledglings for you.

I send you a copy of the Report of the Education Committee, the resolutions based on which I am now slowly getting passed by our Board. The adoption of (*c*) among the essential sub-

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simple titular honours, he accepted the Privy Councillorship, because, though incidentally carrying a title, it was an office; and an office in virtue of which a man of science might, in theory at least, be called upon to act as responsible adviser to the Government, should special occasion arise.

jects has, I hope, secured the future of Elementary Science in London. Cannot you get as much done in Manchester?—Ever yours faithfully,

T. H. HUXLEY.

Sir Charles Lyell was now nearly 74 years old, and though he lived four years longer, age was beginning to tell even upon his vigorous powers. A chance meeting with him elicited the following letter:—

26 ABBEY PLACE, *July 30, 1871.*

MY DEAR DARWIN—I met Lyell in Waterloo Place to-day walking with Carrick Moore—and although what you said the other day had prepared me, I was greatly shocked at his appearance, and still more at his speech. There is no doubt it is affected in the way you describe, and the fact gives me very sad forebodings about him. The Fates send me a swift and speedy end whenever my time comes. I think there is nothing so lamentable as the spectacle of the wreck of a once clear and vigorous mind!

I am glad Frank enjoyed his visit to us. He is a great favourite here, and I hope he will understand that he is free of the house. It was the greatest fun to see Jess and Mady\* on their dignity with him. No more kissing, I can tell you. Miss Mady was especially sublime.

Six out of our seven children have the whooping-cough. Need I say therefore that the wife is enjoying herself?

With best regards to Mrs. Darwin and your daughter (and affectionate love to Polly) believe me.—Ever yours faithfully,

T. H. HUXLEY.

The purchase of the microscope, already referred to, was the subject of another letter to Dr. Dohrn, of which only the concluding paragraph about the School Board, is of general interest. Unfortunately the English microscope did not turn out a success, as compared to the work of the Jena opticians: this is the “optical Sadowa” of the second letter.

I fancy from what you wrote to my wife that there has been some report of my doings about the School Board in Germany. So I send you the number of the *Contemporary Review* † for

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\* Aged 13 and 12 respectively.

† Containing his article on “The School Boards,” etc.

December that you may see what line I have really taken. Fanatics on both sides abuse me, so I think I must be right.

When is this infernal war to come to an end? I hold for Germany as always, but I wish she would make peace.—With best wishes for the New Year.—Ever yours,

T. H. HUXLEY.

26 ABBEY PLACE, *July 7, 1871.*

MY DEAR DOHRN—I have received your packet, and I will take care that your Report is duly presented to the Association. But the "Happy Family" in general, and myself in particular, are very sorry you cannot come to Scotland. We had begun to count upon it, and the children are immeasurably disgusted with the Insects which will not lay their eggs at the right time.

You have become acclimatised to my bad behaviour in the matter of correspondence, so I shall not apologise for being in arrear. I have been frightfully hard-worked with two Royal Commissions and the School Board all sitting at once, but I am none the worse, and things are getting into shape—which is a satisfaction for one's trouble. I look forward hopefully towards getting back to my ordinary work next year.

Your penultimate letter was very interesting to me, but the glimpses into your new views which it affords are very tantalising—and I want more. What you say about the development of the Amnion in your last letter still more nearly brought "Donner und Blitz!" to my lips—and I shall look out anxiously for your new facts. Lankester tells me you have been giving lectures on your views. I wish I had been there to hear.

He is helping me as Demonstrator in a course of instruction in Biology which I am giving to Schoolmasters—with the view of converting them into scientific missionaries to convert the Christian Heathen of these islands to the true faith.

I am afraid that the English microscope turned out to be by no means worth the money and trouble you bestowed upon it. But the glory of such an optical Sadowa should count for something! I wish that you would get your Jena man to supply me with one of his best objectives if the price is not ruinous—I should like to compare it with my  $\frac{1}{2}$  in. of Ross.\*

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\* In this connection it may be noted that he himself invented a combination microscope for laboratory use, still made by Crouch the optician. (See *Journ. Queckett Micr. Club*, vol. v. p. 144.)

All our children but Jessie have the whooping-cough—Pertussis—I don't know your German name for it.—It is distressing enough for them, but, I think, still worse for their mother. However, there are no serious symptoms, and I hope the change of air will set them right.

They all join with me in best wishes and regrets that you are not coming. Won't you change your mind? We start on July 31st.—Ever yours faithfully,

T. H. HUXLEY.

The summer holiday of 1871 was spent at St. Andrews, a place rather laborious of approach at that time, with all the impedimenta of a large and young family, but chosen on account of its nearness to Edinburgh, where the British Association met that year. I well remember the night journey of some ten or eleven hours, the freshness of the early morning at Edinburgh, the hasty excursion with my father up the hill from the station as far as the old High Street. The return journey, however, was made easier by the kindness of Dr. Matthews Duncan, who put up the whole family for a night, so as to break the journey.

We stayed at Castlemount, now belonging to Miss Paton, just opposite the ruined castle. Among other visitors to St. Andrews known to my father were Professors Tait and Crum Brown, who inveigled him into making trial of the "Royal and Ancient" game, which then, as now, was the staple resource of the famous little city. I have a vivid recollection of his being hopelessly bunkered three or four holes from home, and can testify that he bore the moral strain with more than usual calm, as compared with the generality of golfers. Indeed, despite his naturally quick temper and his four years of naval service at a time when, perhaps, the traditions of a former generation had not wholly died out, he had a special aversion to the use of expletives; and the occasional appearance of a strong word in his letters must be put down to a simple literary use which he would have studiously avoided in conversation. A curious physical result followed the vigour with which he threw himself into the unwonted recreation. For the last twenty years his only physical exercise had been walk-

ing, and now his arms went black and blue under the muscular strain, as if they had been bruised.

But the holiday was by no means spent entirely in recreation. One week was devoted to the British Association; another to the examination of some interesting fossils at Elgin; while the last three weeks were occupied in writing two long articles, "Mr. Darwin's Critics," and the address entitled "Administrative Nihilism" referred to above (p. 384), as well as a review of Dana's *Crinoids*. The former, which appeared in the *Contemporary Review* for November (*Coll. Ess.* ii. 120-187) was a review of (1) *Contributions to the Theory of Natural Selection*, by A. R. Wallace, (2) *The Genesis of Species*, by St. George Mivart, F.R.S., and (3) an article in the *Quarterly* for July 1871, on *Darwin's Descent of Man*.

"I am Darwin's bull-dog," he once said, and the *Quarterly Reviewer's* treatment of Darwin, "alike unjust and unbecoming," provoked him into immediate action. "I am about sending you," he writes to Haeckel on Nov. 2, "a little review of some of Darwin's critics. The dogs have been barking at his heels too much of late." Apart from this stricture, however, he notes the "happy change" which "has come over Mr. Darwin's critics. The mixture of ignorance and insolence which at first characterised a large proportion of the attacks with which he was assailed, is no longer the sad distinction of anti-Darwinian criticism." Notes too "that, in a dozen years, the *Origin of Species* has worked as complete a revolution in biological science as the *Principia* did in astronomy—and it has done so, because, in the words of Helmholtz, it contains an 'essentially new creative thought.'"

The essay is particularly interesting as giving evidence of his skill and knowledge in dealing with psychology, as against the *Quarterly Reviewer*, and even with such an unlikely subject as scholastic metaphysics, so that, by an odd turn of events, he appeared in the novel character of a defender of Catholic orthodoxy against an attempt from within that Church to prove that its teachings have in reality always been in harmony with the requirements of modern

science. For Mr. Mivart, while twitting the generality of men of science with their ignorance of the real doctrines of his church, gave a reference to the Jesuit theologian Suarez, the latest great representative of scholasticism, as following St. Augustine in asserting, not direct, but derivative creation, that is to say, evolution from primordial matter endued with certain powers. Startled by this statement, Huxley investigated the works of the learned Jesuit, and found not only that Mr. Mivart's reference to the *Metaphysical Disputations* was not to the point, but that in the "*Tractatus de opere sex Dierum*," Suarez expressly and emphatically rejects this doctrine and reprehends Augustine for asserting it.

By great good luck (he writes to Darwin from St. Andrews) there is an excellent library here, with a good copy of Suarez, in a dozen big folios. Among these I dived, to the great astonishment of the librarian, and looking into them as "the careful robin eyes the delver's toil" (*vide Idylls*), I carried off the two venerable clasped volumes which were most promising.

So I have come out in the new character of a defender of Catholic orthodoxy, and upset Mivart out of the mouth of his own prophet.

Darwin himself was more than pleased with the article, and wrote enthusiastically (see *Life and Letters*, iii. 148-150). A few of his generous words may be quoted to show the rate at which he valued his friend's championship.

What a wonderful man you are to grapple with those old metaphysico-divinity books. . . . The pendulum is now swinging against our side, but I feel positive it will soon swing the other way; and no mortal man will do half as much as you in giving it a start in the right direction, as you did at the first commencement.

And again, after "mounting climax on climax," he continues:—"I must tell you what Hooker said to me a few years ago. 'When I read Huxley, I feel quite infantile in intellect.'"

This sketch of what constituted his holiday—and it was not very much busier than many another holiday—may possibly suggest what his busy time must have been like.



Till the end of the year the immense amount of work did not apparently tell upon him. He rejoiced in it. In December he remarked to his wife that with all his different irons in the fire, he had never felt his mind clearer or his vigour greater. Within a week he broke down quite suddenly, and could neither work nor think. He refers to this in the following letter :—

JERMYN STREET, Dec. 22, 1871.

MY DEAR JOHNNY—You are certainly improving. As a practitioner in the use of cold steel myself, I have read your letter in to-day's *Nature*, "mit Ehrfurcht und Bewunderung." And the best evidence of the greatness of your achievement is that it extracts this expression of admiration from a poor devil whose brains and body are in a colloid state, and who is off to Brighton for a day or two this afternoon.

God be with thee, my son, and strengthen the contents of thy gall-bladder!—Ever thine,

T. H. HUXLEY.

P.S.—Seriously, I am glad that at last a protest has been raised against the process of anonymous self-praise to which our friend is given. I spoke to Smith the other day about that dose of it in the "*Quarterly*" article on Spirit-rapping.

## CHAPTER XXVI

1872

DYSPEPSIA, that most distressing of maladies, had laid firm hold upon him. He was compelled to take entire rest for a time. But his first holiday produced no lasting effect, and in the summer he was again very ill. Then the worry of a troublesome lawsuit in connection with the building of his new house intensified both bodily illness and mental depression. He had great fears of being saddled with heavy costs at the moment when he was least capable of meeting any new expense—hardly able even to afford another much-needed spell of rest. But in his case, as in others, at this critical moment the circle of fellow-workers in science to whom he was bound by ties of friendship, resolved that he should at least not lack the means of recovery. In their name Charles Darwin wrote him the following letter, of which it is difficult to say whether it does more honour to him who sent it or to him who received it:—

DOWN, BECKENHAM, KENT, *April 23, 1873.*

MY DEAR HUXLEY—I have been asked by some of your friends (eighteen in number) to inform you that they have placed through Robarts, Lubbock & Company, the sum of £2100 to your account at your bankers. We have done this to enable you to get such complete rest as you may require for the re-establishment of your health; and in doing this we are convinced that we act for the public interest, as well as in accordance with our most earnest desires. Let me assure you that we are all your warm personal friends, and that there is not a stranger or mere acquaintance amongst us. If you could have heard what was said, or could have read what was, as I believe, our inmost thoughts, you would know that we all feel towards

you, as we should to an honoured and much loved brother. I am sure that you will return this feeling, and will therefore be glad to give us the opportunity of aiding you in some degree, as this will be a happiness to us to the last day of our lives. Let me add that our plan occurred to several of your friends at nearly the same time and quite independently of one another.—My dear Huxley, your affectionate friend,

CHARLES DARWIN.

It was a poignant moment. "What have I done to deserve this?" he exclaimed. The relief from anxiety, so generously proffered, entirely overcame him; and for the first time, he allowed himself to confess that in the long struggle against ill-health, he had been beaten; but, as he said, only enough to teach him humility.

His first trip in search of health was in 1872, when he obtained two months' leave of absence, and prepared to go to the Mediterranean. His lectures to women on Physiology at South Kensington were taken over by Dr. Michael Foster, who had already acted as his substitute in the Fullarian course of 1868. But even on this cruise after health he was not altogether free from business. The stores of biscuit at Gibraltar and Malta were infested with a small grub and its cocoons. Complaints to the home authorities were met by the answer that the stores were prepared from the purest materials and sent out perfectly free from the pest. Discontent among the men was growing serious, when he was requested by the Admiralty to investigate the nature of the grub and the best means of preventing its ravages. In the end he found that the biscuits were packed within range of stocks of newly arrived, unpurified cocoa, from which the eggs were blown into the stores while being packed, and there hatched out. Thereafter the packing was done in another place and the complaints ceased.

*Jan. 3, 1872.*

MY DEAR DOHRN—It is true enough that I am somewhat "erkränkt," though beyond general weariness, incapacity and disgust with things in general, I do not precisely know what is the matter with me.

Unwillingly, I begin to suspect that I overworked myself

last year. Doctors talk seriously to me, and declare that all sorts of wonderful things will happen if I do not take some more efficient rest than I have had for a long time. My wife adds her quota of persuasion and admonition, until I really begin to think I must do something, if only to have peace.

What if I were to come and look you up in Naples, somewhere in February, as soon as my lectures are over?

The "one-plate system" might cure me of my incessant dyspeptic nausea. A detestable grub—larva of *Ephestia elatella*—has been devouring Her Majesty's stores of biscuits at Gibraltar. I have had to look into his origin, history, and best way of circumventing him—and maybe I shall visit Gibraltar and perhaps Malta. In that case, you will see me turn up some of these days at the Palazzo Torlonia.

Herbert Spencer has written a friendly attack on "Administrative Nihilism," which I will send you; in the same number of the *Fortnightly* there is an absurd epicene splutter on the same subject by Mill's step-daughter, Miss Helen Taylor. I intended to publish the paper separately, with a note about Spencer's criticism, but I have had no energy nor faculty to do anything lately.

Tell Lankester, with best regards, that I believe the teaching of teachers in 1872 is arranged, and that I shall look for his help in due course.

The "Happy family" have had the measles since you saw them, but they are well again.

I write in Jermyn Street, so they cannot send messages; otherwise there would be a chorus from them and the wife of good wishes and kind remembrances.—Ever yours,

T. H. HUXLEY.

He left Southampton on January 11, in the *Malta*. On the 16th, he notes in his diary, "I was up just in time to see the great portal of the Mediterranean well. It was a lovely morning, and nothing could be grander than Ape Hill on one side and the Rock on the other, looking like great lions or sphinxes on each side of a gateway."

The morning after his arrival he breakfasted with Admiral Hornby, who sent him over to Tangier in the *Helicon*, giving the Bishop of Gibraltar a passage at the same time. This led him to note down, "How the naval men love Baxter and all his works." A letter from Dr. Hooker to

Sir John Hay ensured him a most hospitable welcome, though continual rain spoiled his excursions. On the 21st he returned to Gibraltar, leaving three days later in the *Nyanza* for Alexandria, which was reached on February 1. At that "muddy hole" he landed in pouring rain, and it was not till he reached Cairo the following day that he at last got into his longed-for sunshine.

Seeing that three of his eight weeks had been spent in merely getting to sunshine, his wife and doctor conspired to apply for a third month of leave, which was immediately granted, so that he now had time to go up the Nile as far as Assouan in that most restful of conveyances, a dahabiah.

Cairo more than answered his expectations. He stayed here till the 13th, making several excursions in company with Sir W. Gregory, notably to Boulak Museum, where he particularly notes the "man with ape" from Memphis; and, of course, the pyramids, of which he remarks that Cephren's is cased at the top with limestone, not granite. His note-book and sketch-book show that he was equally interested in archæology, in the landscape and scenes of everyday life, and in the peculiar geographical and geological features of the country. His first impression of the Delta was its resemblance to Belgium and Lincolnshire. He has sections and descriptions of the Mokatta hill, and the windmill mound, with a general panorama of the surrounding country and an explanation of it. He remarks at Memphis how the unburnt brick of which the mounds are made up had in many places become *remanié* into a stratified deposit—distinguishable from Nile mud chiefly by the pottery fragments—and notes the bearing of this fact on the Cairo mounds. It is the same on his trip up the Nile; he jots down the geology whenever opportunity offered; remarks, as indication of the former height of the river, a high mud-bank beyond Edfou, and near Assouan a pot-hole in the granite fifty feet above the present level. Here is a detailed description of the tomb of Aahmes; there a river-scene beside the pyramid of Meidum; or vivid sketches of vulture and jackal at a meal in the desert, the jackal in possession of the carcass, the vulture impatiently waiting

his good pleasure for the last scraps; of the natives working at the endless shadoofs; of a group of listeners around a professional story-teller—unfinished, for he was observed sketching them.

Egypt left a profound impression upon him. His artistic delight in it apart, the antiquities and geology of the country were a vivid illustration to his trained eye of the history of man and the influence upon him of the surrounding country, the link between geography and history.

He left behind him for a while a most unexpected memorial of his visit. A friend not long after going to the pyramids, was delighted to find himself thus adjured by a donkey-boy, who tried to cut out his rival with “Not him donkey, sah; him donkey bad, sah; my donkey good; my donkey 'Fessor-uxley donkey, sah.” It appears that the Cairo donkey-boys have a way of naming their animals after celebrities whom they have borne on their backs.

While at Thebes, on his way down the river again, he received news of the death of the second son of Matthew Arnold, to whom he wrote the following letter:—

THEBES, *March 10, 1872.*

MY DEAR ARNOLD—I cannot tell you how shocked I was to see in the papers we received yesterday the announcement of the terrible blow which has fallen upon Mrs. Arnold and yourself.

Your poor boy looked such a fine manly fellow the last time I saw him, when we dined at your house, that I had to read the paragraph over and over again before I could bring myself to believe what I read. And it is such a grievous opening of a wound hardly yet healed that I hardly dare to think of the grief which must have bowed down Mrs. Arnold and yourself.

I hardly know whether I do well in writing to you. If such trouble befel me there are very few people in the world from whom I could bear even sympathy—but you would be one of them, and therefore I hope that you will forgive a condolence which will reach you so late as to disturb rather than soothe, for the sake of the hearty affection which dictates it.

My wife has told me of the very kind letter you wrote her. I was thoroughly broken down when I left England, and did not get much better until I fell into the utter and absolute

laziness of dahabieh life. A month of that has completely set me up. I am as well as ever; and though very grateful to Old Nile for all that he has done for me—not least for a whole universe of new thoughts and pictures of life—I begin to feel strongly

‘the need of a world of men for me.’

But I am not going to overwork myself again. Pray make my kindest remembrances to Mrs. Arnold, and believe me, always yours very faithfully,

T. H. HUXLEY.

Leaving Assouan on March 3, and Cairo on the 18th, he returned by way of Messina to Naples, taking a day at Catania to look at Etna. At Naples he found his friend Dohrn was absent, and his place as host was filled by his father. Vesuvius was ascended, Pozzuoli and Pompeii visited, and two days spent in Rome.

HOTEL DE GRANDE BRETAGNE, NAPLES,  
*March 31, 1872.*

MY DEAR TYNDALL—Your very welcome letter did not reach me until the 18th of March, when I returned to Cairo from my expedition to Assouan. Like Johnny Gilpin, I “little thought, when I set out, of running such a rig”; but while at Cairo I fell in with Ossory of the Athenæum, and a very pleasant fellow, Charles Ellis, who had taken a dahabieh, and were about to start up the Nile. They invited me to take possession of a vacant third cabin, and I accepted their hospitality, with the intention of going as far as Thebes and returning on my own hook. But when we got to Thebes I found there was no getting away again without much more exposure and fatigue than I felt justified in facing just then, and as my friends showed no disposition to be rid of me, I stuck to the boat, and only left them on the return voyage at Rodu, which is the terminus of the railway, about 150 miles from Cairo.

We had an unusually quick journey, as I was little more than a month away from Cairo, and as my companions made themselves very agreeable, it was very pleasant. I was not particularly well at first, but by degrees the utter rest of this “always afternoon” sort of life did its work, and I am as well and vigorous now as ever I was in my life.

I should have been home within a fortnight of the time I had originally fixed. This would have been ample time to have

enabled me to fulfil all the engagements I had made before starting; and Donnelly had given me to understand that "My Lords" would not trouble their heads about my stretching my official leave. Nevertheless I was very glad to find the official extension (which was the effect of my wife's and your and Bence Jones's friendly conspiracy) awaiting me at Cairo. A rapid journey home *via* Brindisi might have rattled my brains back into the colloid state in which they were when I left England. Looking back through the past six months I begin to see that I have had a narrow escape from a bad break-down, and I am full of good resolutions.

As the first-fruit of these you see that I have given up the school-board, and I mean to keep clear of all that semi-political work hereafter. I see that Sandon (whom I met at Alexandria) and Miller have followed my example, and that Lord Lawrence is likely to go. What a skedaddle!

It seems very hard to escape, however. Since my arrival here, on taking up the *Times* I saw a paragraph about the Lord Rectorship of St. Andrews. After enumerating a lot of candidates for that honour, the paragraph concluded, "But we understand that at present Professor Huxley has the best chance." It is really too bad if anyone has been making use of my name without my permission. But I don't know what to do about it. I had half a mind to write to Tulloch to tell him that I can't and won't take any such office, but I should look rather foolish if he replied that it was a mere newspaper report, and that nobody intended to put me up.

Egypt interested me profoundly, but I must reserve the tale of all I did and saw there for word of mouth. From Alexandria I went to Messina, and thence made an excursion along the lovely Sicilian coast to Catania and Etna. The old giant was half covered with snow, and this fact, which would have tempted you to go to the top, stopped me. But I went to the Val del Bove, whence all the great lava streams have flowed for the last two centuries, and feasted my eyes with its rugged grandeur. From Messina I came on here, and had the great good fortune to find Vesuvius in eruption. Before this fact the vision of good Bence Jones forbidding much exertion vanished into thin air, and on Thursday up I went in company with Ray Lankester and my friend Dohrn's father, Dohrn himself being unluckily away. We had a glorious day, and did not descend till late at night. The great crater was not very active, and contented itself with throwing out great clouds of steam and volleys of



red-hot stones now and then. These were thrown towards the south-west side of the cone, so that it was practicable to walk all round the northern and eastern lip, and look down into the Hell Gate. I wished you were there to enjoy the sight as much as I did. No lava was issuing from the great crater, but on the north side of this, a little way below the top, an independent cone had established itself as the most charming little pocket-volcano imaginable. It could not have been more than 100 feet high, and at the top was a crater not more than six or seven feet across. Out of this, with a noise exactly resembling a blast furnace and a slowly-working high pressure steam engine combined, issued a violent torrent of steam and fragments of semi-fluid lava as big as one's fist, and sometimes bigger. These shot up sometimes as much as 100 feet, and then fell down on the sides of the little crater, which could be approached within fifty feet without any danger. As darkness set in, the spectacle was most strange. The fiery stream found a lurid reflection in the slowly-drifting steam cloud, which overhung it, while the red-hot stones which shot through the cloud shone strangely beside the quiet stars in a moonless sky.

Not from the top of this cinder cone, but from its side, a couple of hundred feet down, a stream of lava issued. At first it was not more than a couple of feet wide, but whether from receiving accessions or merely from the different form of slope, it got wider on its journey down to the Atrio del Cavallo, a thousand feet below. The slope immediately below the exit must have been near fifty, but the lava did not flow quicker than very thick treacle would do under like circumstances. And there were plenty of freshly cooled lava streams about, inclined at angles far greater than those which that learned Academician, Elie de Beaumont, declared to be possible. Naturally I was ashamed of these impertinent lava currents, and felt inclined to call them "Laves mousseuses."

Courage, my friend, behold land! I know you love my handwriting. I am off to Rome to-day, and this day-week, if all goes well, I shall be under my own roof-tree again. In fact I hope to reach London on Saturday evening. It will be jolly to see your face again.—Ever yours faithfully,

T. H. HUXLEY.

My best remembrances to Hirst if you see him before I do.

My father reached home on April 6, sunburnt and bearded almost beyond recognition, but not really well, for

as soon as he began to work again in London, his old enemy returned. Early hours, the avoidance of society and societies, an hour's riding before starting at nine for South Kensington, were all useless; the whole year was poisoned until a special diet prescribed by Dr. (afterwards Sir) Andrew Clark, followed by another trip abroad, effected a cure. I remember his saying once that he learned by sad experience that such a holiday as that in Egypt was no good for him. What he really required was mountain air and plenty of exercise. The following letters fill up the outline of this period:—

26 ABBEY PLACE, *May 20, 1872.*

MY DEAR DOHRN — I suppose that you are now back in Naples, perambulating the Chiaja, and looking ruefully on the accumulation of ashes on the foundations of the aquarium! The papers, at any rate, tell us that the ashes of Vesuvius have fallen abundantly at Naples. Moreover, that abominable municipality is sure to have made the eruption an excuse for all sorts of delays. May the gods give you an extra share of temper and patience!

What an unlucky dog our poor Ray is, to go and get fever when of all times in the world's history he should not have had it. However, I hear he is better and on his way home. I hope he will be well enough when he returns not only to get his Fellowship, but to help me in my schoolmaster work in June and July.

I was greatly disgusted to miss you in Naples, but it was something to find your father instead. What a vigorous, genial *youngster* of three score and ten he is. I declare I felt quite aged beside him. We had a glorious day on Vesuvius, and behaved very badly by leaving him at the inn for I do not know how many hours, while we wandered about the cone. But he had a very charming young lady for companion, and possibly had the best of it. I am very sorry that at the last I went off in a hurry without saying "Good-bye" to him, but I desired Lankester to explain, and I am sure he will have sympathised with my anxiety to see Rome.

I returned, thinking myself very well, but a bad fit of dyspepsia seized me, and I found myself obliged to be very idle and very careful of myself—neither of which things are to my taste. But I am right again now, and hope to have no more backslidings. However, I am afraid I may not be able to attend

the Brighton meeting. In which case you will have to pay us a visit, wherever we may be—where, we have not yet made up our minds, but it will not be so far as St. Andrews.

Now for a piece of business. The new Governor of Ceylon is a friend of mine, and is proposing to set up a Natural History Museum in Ceylon. He wants a curator—some vigorous fellow with plenty of knowledge and power of organisation who will make use of his great opportunities. He tells me he thinks he can start him with £350 a year (and a house), with possible increase to £400. I do not know any one here who would answer the purpose. Can you recommend me any one? If you can let me know at once, and don't take so long in writing to me as I have been in writing to you.

I await the "Prophecies of the Holy Antonius" \* anxiously. Like the Jews of old, I come of an unbelieving generation, and need a sign. The bread and the oil, also the chamber in the wall, shall not fail the prophet when he comes in August: nor Donner and Blitzes either.

I leave the rest of the space for the wife.—Ever yours,  
T. H. H.

The following is in reply to a jest of Dr. Dohrn's—who was still a bachelor—upon a friend's unusual sort of offering to a young lady.

I suspected the love affair you speak of, and thought the young damsel very attractive. I suppose it will come to nothing, even if he be disposed to add his hand to the iron and quinine, in the next present he offers. . . . And, oh my Diogenes, happy in a tub of arthropodous *Entwickelungsgeschichte*, † despise not beefsteaks, nor wives either. They also are good.

JERMYN STREET, *June 5, 1872.*

MY DEAR DOHRN—I have written to the Governor of Ceylon, and enclosed the first half of your letter to me as he understands High Dutch. I have told him that the best thing he can do is to write to you at Naples and tell you he will be very happy to see you as soon as you can come. And that if you do come you will give him the best possible advice about his museum, and let him have no rest until he has given you a site for a zoological station.

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\* His work on the development of the Arthropoda.

† *History of Development.*

I have no doubt you will get a letter from him in three weeks or so. His name is Gregory, and you will find him a good-humoured acute man of the world, with a very great general interest in scientific and artistic matters. Indeed in art I believe he is a considerable connoisseur.

I am very grieved to hear of your father's serious illness. At his age cerebral attacks are serious, and when we spent so many pleasant hours together at Naples, he seemed to have an endless store of vigour—very much like his son Anton.

What put it into your head that I had any doubt of your power of work? I am ready to believe that you are Hydra in the matter of heads and Briareus in the matter of hands.

. . . If you go to Ceylon I shall expect you to come back by way of England. It's the shortest route anywhere from India, though it may not look so on the map.

How am I? Oh, getting along and just keeping the devil of dyspepsia at arm's length. The wife and other members of the H. F. are well, and would send you greetings if they knew I was writing to you.—Ever yours faithfully,

T. H. HUXLEY.

A little later Von Willemoes Suhm ("why the deuce does he have such a long name, instead of a handy monosyllable or dissyllable like Dohrn or Huxley?") was recommended for the post. He afterwards was one of the scientific staff of the *Challenger*, and died during the voyage.

MORTHOE, NEAR BARNSTAPLE, NORTH DEVON,  
Aug. 5, 1872.

MY DEAR DOHRN—I trust you have not been very wroth with me for my long delay in answering your last letter. For the last six weeks I have been very busy lecturing daily to a batch of schoolmasters, and looking after their practical instruction in the laboratory which the Government has, at last, given me. In the "intervals of business" I have been taking my share in a battle which has been raging between my friend Hooker of Kew and his official chief. . . . And moreover I have just had strength enough to get my daily work done and no more, and everything that could be put off has gone to the wall. Three days ago, the "Happy Family," bag and baggage, came to this remote corner, where I propose to take a couple of months' entire rest—and put myself in order for next winter's campaign. It is a little village five miles from the nearest town

(which is Ilfracombe), and our house is at the head of a ravine running down to the sea. Our backs are turned to England and our faces to America with no land that I know of between. The country about is beautiful, and if you will come we will put you up at the little inn, and show you something better than even Swanage. There are slight difficulties about the commissariat, but that is the Hausfrau's business, and not mine. At the worst, bread, eggs, milk, and rabbits are certain, and the post from London takes two days!

MORTHOE, ILFRACOMBE, N. DEVON,

Aug. 23, 1872.

MY DEAR WHIRLWIND—I promise you all my books, past, present, and to come for the Aquarium. The best part about them is that they will not take up much room. Ask for Owen's by all means; "Fas est etiam ab hoste doceri." I am very glad you have got the British Association publications, as it will be a good precedent for the Royal Society.

Have you talked to Hooker about marine botany? He may be able to help you as soon as X. the accursed (may jackasses sit upon his grandmother's grave, as we say in the East) leaves him alone.

It is hateful that you should be in England without seeing us, and for the first time I lament coming here. The children howled in chorus when they heard that you could not come. At this moment the whole tribe and their mother have gone to the sea, and I must answer your letter before the post goes out, which it does here about half an hour after it comes in.—Ever yours very faithfully,

T. H. HUXLEY.

In 1872 Huxley was at length enabled to establish in his regular classes a system of science teaching based upon laboratory work by the students, which he had long felt to be the only true method. It involved the verification of every fact by each student, and was a training in scientific method even more than in scientific fact. Had circumstances only permitted, the new epoch in biological teaching might have been antedated by many years. But, as he says in the preface to the *Practical Biology*, 1875—

Practical work was forbidden by the limitations of space in the building in Jermyn Street, which possessed no room applicable to the purpose of a laboratory, and I was obliged to

content myself, for many years, with what seemed the next best thing, namely, as full an exposition as I could give, of the characters of certain plants and animals, selected as types of vegetable and animal organisation, by way of introduction to systematic zoology and paleontology.

There was no laboratory work, but he would show an experiment or a dissection during the lecture or perhaps for a few minutes after, when the audience crowded round the lecture table.

The opportunity came in 1871. As he afterwards impressed upon the great city companies in regard to technical education, the teaching of science throughout the country turned upon the supply of trained teachers. The part to be played by elementary science under the Education Act of 1870, added urgency to the question of proper teaching. With this in view, he organised a course of instruction for those who had been preparing pupils for the examinations of the Science and Art Department, "scientific missionaries," as he described them to Dr. Dohrn.

In the promotion of the practical teaching of biology (writes the late Jeffery Parker, *Nat. Sci.* viii. 49), Huxley's services can hardly be overestimated. Botanists had always been in the habit of distributing flowers to their students, which they could dissect or not as they chose; animal histology was taught in many colleges under the name of practical physiology; and at Oxford an excellent system of zoological work had been established by the late Professor Rolleston.\* But the biological laboratory, as it is now understood, may be said to date from about 1870, when Huxley, with the co-operation of Professors

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\* "Rolleston (Professor Lankester writes to me) was the first to systematically conduct the study of Zoology and Comparative Anatomy in this country by making use of a carefully selected series of animals. His 'types' were the Rat, the Common Pigeon, the Frog, the Perch, the Crayfish, Blackbeetle, Anodon, Snail, Earthworm, Leech, Tapeworm. He had a series of dissections of these mounted, also loose dissections and elaborate MS. descriptions. The student went through this series, dissecting fresh specimens for himself. After some ten years' experience Rolleston printed his MS. directions and notes as a book, called *Forms of Animal Life*.

"This all preceded the practical class at South Kensington in 1871. I have no doubt that Rolleston was influenced in his plan by your

Foster, Rutherford, Lankester, Martin, and others,\* held short summer classes for science teachers at South Kensington, the daily work consisting of an hour's lecture followed by four hours' laboratory work, in which the students verified for themselves facts which they had hitherto heard about and taught to their unfortunate pupils from books alone. The naïve astonishment and delight of the more intelligent among them was sometimes almost pathetic. One clergyman, who had for years conducted classes in physiology under the Science and Art Department, was shown a drop of his own blood under the microscope. "Dear me!" he exclaimed, "it's just like the picture in Huxley's *Physiology*."

Later, in 1872, when the biological department of the Royal School of Mines was transferred to South Kensington, this method was adopted as part of the regular curriculum of the school, and from that time the teaching "of zoology by lectures alone became an anachronism."

The first of these courses to schoolmasters took place, as has been said, in 1871. Some large rooms on the ground floor of the South Kensington Museum were used for the purpose. There was no proper laboratory, but professor and demonstrators rigged up everything as wanted. Huxley was in the full tide of that more than natural energy which preceded his break-down in health, and gave what Professor Ray Lankester describes as "a wonderful course of lectures," one every day from ten to eleven for six weeks, in June and half July. The three demonstrators (those named first on the list above) each took a third of the class, about thirty-five apiece. "Great enthusiasm prevailed. We went over a number of plants and of animals—including

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father's advice. But Rolleston had the earlier opportunity of putting the method into practice.

"Your father's series of types were chosen so as to include plants, and he gave more attention to microscopic forms and to microscopic structure than did Rolleston."

It was distinctive of the lectures that they were on biology, on plants as well as animals, to illustrate all the fundamental features of living things.

\* T. J. Parker, G. B. Howes, and Sir W. Thiselton Dyer, K. C. M. G., C. I. E.

microscopic work and some physiological experiment. The 'types' were more numerous than in later courses."

In 1872 the new laboratory—the present one—was ready. "I have a laboratory," writes Huxley to Dohrn, "which it shall do your eyes good to behold when you come back from Ceylon, the short way" (*i.e. via* England). Here a similar course, under the same demonstrators, assisted by H. N. Martin, was given in the summer, Huxley, though very shaky in health, making a point of carrying them out himself.

26 ABBEY PLACE, June 4, 1872.

MY DEAR TYNDALL—I *must* be at work on examination papers all day to-day, but to-morrow I am good to lunch with you (and abscond from the Royal Commission, which will get on very well without me) or to go with you and call on your friends, whichever may be most convenient.

Many thanks for all your kind and good advice about the lectures, but I really think they will not be too much for me, and it is of the utmost importance I should carry them on.

They are the commencement of a new system of teaching which, if I mistake not, will grow into a big thing and bear great fruit, and just at this present moment (nobody is necessary very long) I am the necessary man to carry it on. I could not get a suppléant if I would, and you are no more the man than I am to let a pet scheme fall through for the fear of a little risk of self. And really and truly I find that by taking care I pull along very well. Moreover, it isn't my brains that get wrong, but only my confounded stomach.

I have read your memorial \* which is very strong and striking, but a difficulty occurs to me about a good deal of it, and that is that it won't do to quote Hooker's official letters before they have been called for in Parliament, or otherwise made public. We should find ourselves in the wrong officially, I am afraid, by doing so. However we can discuss this when we meet. I will be at the Athenæum at 4 o'clock.—Ever yours faithfully,

T. H. HUXLEY.

As for the teaching by "types," which was the most salient feature of his method, and therefore the most easily applied and misapplied, Professor Parker continues:—

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\* In the affair of Dr. Hooker already referred to.



Huxley's method of teaching was based upon the personal examination by the student of certain "types" of animals and plants selected with a view of illustrating the various groups. But, in his lectures, these types were not treated as the isolated things they necessarily appear in a laboratory manual or an examination syllabus; each, on the contrary, took its proper place as an example of a particular grade of structure, and no student of ordinary intelligence could fail to see that the types were valuable, not for themselves, but simply as marking, so to speak, the chapters of a connected narrative. Moreover, in addition to the types, a good deal of work of a more general character was done. Thus, while we owe to Huxley more than to anyone else the modern system of teaching biology, he is by no means responsible for the somewhat arid and mechanical aspect it has assumed in certain quarters.

The application of the same system to botanical teaching was inaugurated in 1873, when, being compelled to go abroad for his health, he arranged that Mr. (now Sir W.) Thiselton Dyer should take his place and lecture on botany.

The *Elementary Instruction in Biology*, published in 1875, was a text-book based upon this system. This book, in writing which Huxley was assisted by his demonstrator, H. N. Martin, was reprinted thirteen times before 1888, when it was "Revised and Extended by Howes and Scott," his later assistants. The revised edition is marked by one radical change, due to the insistence of his demonstrator, the late Prof. Jeffery Parker. In the first edition, the lower forms of life were first dealt with; from simple cells—amœba, yeast-plant, blood-corpuscle—the student was taken through an ascending series of plants and of animals, ending with the frog or rabbit. But "the experience of the Lecture-room and the Laboratory taught me," writes Huxley in the new preface, "that philosophical as it might be in theory, it had defects in practice." The process might be regarded as not following the scientific rule of proceeding from the known to the unknown; while the small and simple organisms required a skill in handling high power microscopes which was difficult for beginners to acquire. Hence the course was reversed, and began with the more

familiar type of the rabbit or frog. This was Rolleston's practice; but it may be noted that Professor Ray Lankester has always maintained and further developed the "original Huxleian plan of beginning with the same microscopic forms" as being a most important philosophic improvement on Rolleston's plan, and giving, he considers, "the truer 'twist,' as it were, to a student's mind."

When the book was sent to Darwin, he wrote back (November 12, 1875):—

MY DEAR HUXLEY—Many thanks for your biology, which I have read. It was a real stroke of genius to think of such a plan. Lord, how I wish that I had gone through such a course.  
—Ever yours,  
C. DARWIN.

A large portion of his time and energy was occupied in the organisation of this course of teaching for teachers, and its elaboration before being launched on a larger scale in October, when the Biological Department of the Jermyn Street school was transferred to the new buildings at South Kensington, fitted with laboratories which were to excite his friend Dr. Dohrn's envy. But he was also at work upon his share of the *Science Primers*, so far as his still uncertain health allowed. This and the affairs of the British Association are the subject of several letters to Sir Henry Roscoe and Dr. Tyndall.

26 ABBEY PLACE, *April 8, 1872.*

MY DEAR ROSCOE—Many thanks for your kind letter of welcome. My long rest has completely restored me. As my doctor told me, I was sound, wind and limb, and had merely worn myself out. I am not going to do that again, and you see that I have got rid of the School Board. It was an awful incubus!

Oddly enough I met the Ashtons in the Vatican, and heard about your perplexities touching Oxford. I should have advised you to do as you have done. I think that you have a great piece of work to do at Owens College, and that you will do it. If you had gone to Oxford you would have sacrificed all the momentum you have gained in Manchester; and would have had to begin *de novo*, among conditions which, I imagine, it is very hard for a non-University man to appreciate and adjust himself to.

I like the look of the "Primers" (of which Macmillan has

sent me copies to-day) very much, and shall buckle to at mine as soon as possible. I am very glad you did not wait for me. I remained in a very shaky condition up to the middle of March, and could do nothing.—Ever yours very faithfully,

T. H. HUXLEY.

The wife unites with me in kind regards to Mrs. Roscoe and yourself.

MORTHOE, ILFRACOMBE, N. DEVON,

Sept. 9, 1872.

MY DEAR TYNDALL—I was very glad to have news of you, and to hear that you are vigorous.

My outing hitherto has not been very successful, so far as the inward man is concerned at least, for the weather has been good enough. But I have been worried to death with dyspepsia and the hypochondriacal bedevilments that follow in its train, until I am seriously thinking of returning to town to see if the fine air of St. John's Wood (as the man says in *Punch*) won't enable me to recover from the effects of the country.

I wish I were going with you to Yankee Land, not to do any lecturing, God forbid! but to be a quiet spectator in a corner of the enthusiastic audiences. I am as lazy as a dog, and the rôle of looker-on would just suit me. However, I have a good piece of work to do in organising my new work at South Kensington.

I have just asked my children what message they have to send to you, and they send their love; very sorry they won't see you before you go, and hope you won't come back speaking through your nose!

I shall be in town this week or next, and therefore *shall* see you.—Ever yours faithfully,

T. H. HUXLEY.

26 ABBEY PLACE, Sept. 17, 1872.

MY DEAR ROSCOE—Your letter has followed me from Morthoe here. We had good enough weather in Devon—but my stay there was marred by the continuous dyspepsia and concurrent hypochondriacal incapacity. At last, I could not stand it any longer, and came home for "change of air," leaving the wife and chicks to follow next week. By dint of living on cocoa and Revalenta, and giving up drink, tobacco, and all other things that make existence pleasant, I am getting better.

What was your motive in getting kicked by a horse? I stopped away from the Association without that; and am not sorry to have been out of the way of the X. business. What is

to become of the association if — is to monopolise it? And then there was that scoundrel, Louis Napoleon—to whom no honest man ought to speak—gracing the scene. I am right glad I was out of it.

I am at my wits' end to suggest a lecturer for you. I wish I could offer myself, but I have refused everything of that sort on the score of health; and moreover, I am afraid of my wife!

What do you say to Ramsay? He lectures very well. I have done nothing whatever to the Primer. Stewart sent me Geikie's letter this morning, and I have asked Macmillan to send Geikie the proofs of my Primer so far as they go. We must not overlap more than can be helped.

I have not seen Hooker yet since my return. While all this row has been going on, I could not ask him to do anything for us. And until X. is dead and d—d (officially at any rate), I am afraid there will be little peace for him.—Ever yours very faithfully,

T. H. HUXLEY.

Please remember me very kindly to Mrs. Roscoe.

In a letter of September 25 is a reference to the way in which his increasing family had outgrown his house in Abbey Place. Early in the preceding year, he had come to the decision to buy a small house in the same neighbourhood, and add to it so as to give elbow-room to each and all of the family. This was against the advice of his friend and legal adviser, to whom he wrote announcing his decision, as follows. The letter was adorned with a sketch of an absurd cottage, "Ye House!" perched like a windmill on a kind of pedestal, and with members of the family painfully ascending a ladder to the upper storey, above the ominous legend, "Staircase forgotten."

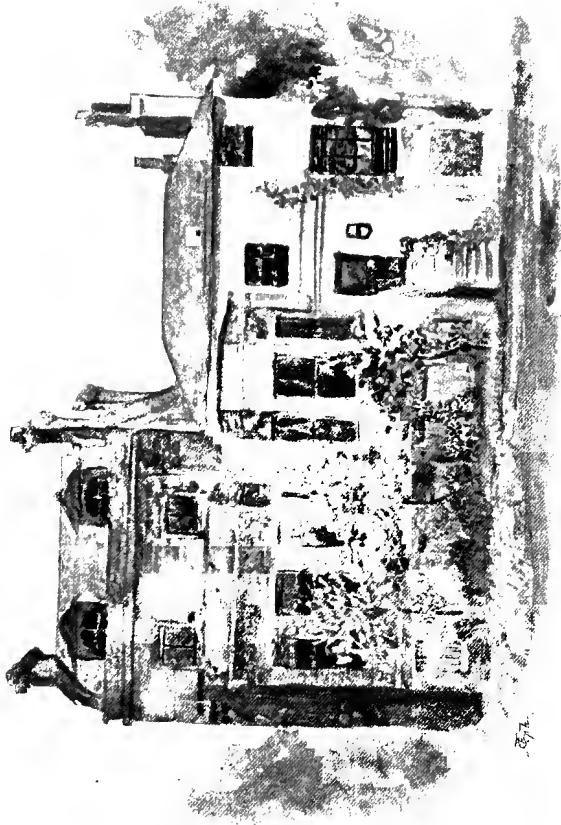
*March 20, 1871.*

MY DEAR BURTON—There is something delightfully refreshing in rushing into a piece of practical work in the teeth of one's legal adviser.

If the lease of a piece of ground whereon I am going to build mine house come to you, will you see if it's all right.—Yours wilfully,

T. H. HUXLEY.

This house, No. 4 Marlborough Place, stands on the north side of that quiet street, close to its junction with Abbey Road. It is next door to the Presbyterian Church,



*After a Water-Colour Sketch by R. Huxley.*

NO. 4 MARLBOROUGH PLACE—FROM THE GARDEN.



on the other side of which again is a Jewish synagogue. The irregular front of the house, with the original cottage, white-painted and deep-eaved, joined by a big porch to the new uncompromising square face of yellow brick, distinguished only by its extremely large windows, was screened from the road by a high oak paling, and a well-grown row of young lime trees. Taken as a whole, it was not without character, and certainly was unlike most London houses. It was built for comfort, not beauty; designed, within stringent limits as to cost, to give each member of the family room to get away by himself or herself if so disposed. Moreover, the gain in space made it more possible to see something of friends or put up a guest, than in the small and crowded house in Abbey Place.

A small garden lay in front of the house; a considerably larger garden behind, wherein the chief ornament was then a large apple-tree, that never failed to spread a cloud of blossom for my father's birthday, the 4th of May.

Over the way, too, for many years we were faced by a long garden full of blossoming pear-trees in which thrushes and blackbirds sang and nested, belonging to a desolate house in the Abbey Road, which was tenanted by a solitary old man, supposed to be a male prototype of Miss Havisham in *Great Expectations*.

The move was accompanied by a unique and unpleasant experience. A knavish fellow, living in a cottage close to the foot of the garden, sought to blackmail the new-comer, under threat of legal proceedings, alleging that a catchment well for surface drainage had made his basement damp. Unfortunately for his case, it could be shown that the pipes had not yet been connected with the well, and when he carried out his threat, he gained nothing from his suit in Chancery and his subsequent appeal, except some stinging remarks from Vice-Chancellor Malins.

I am afraid the brute is impecunious (wrote my father after the first suit failed), and that I shall get nothing out of him. So I shall have had three months' worry, and be fined £100 or so for being wholly and absolutely in the right.

Happily the man turned out to have enough means to pay the bulk of the costs; but that was no compensation for the mental worry and consequent ill-health entailed from November to June.

The only amusing point in the whole affair was when the plaintiff's solicitors had the face to file an affidavit before the Vice-Chancellor himself in answer to his strictures upon the case, "about as regular a proceeding," reports Mr. Burton, "as for a middy to reply upon the Post Captain on his own quarter-deck."

The move was made in the third week of December (1872) amid endless rain and mud and with workmen still in the house. It was attended by one inconvenience. He writes to Darwin on December 20, 1872:—

I am utterly disgusted at having only just received your note of Tuesday. But the fact is, there is a certain inconvenience about having *four* addresses as has been my case for the most part of this week, in consequence of our moving—and as I have not been to Jermyn Street before to-day, I have missed your note. I should run round to Queen Anne St. now on the chance of catching you, but I am bound here by an appointment.

One incident of the move, however, was more agreeable. Mr. Herbert Spencer took the opportunity of sending a New Year's gift for the new house, in the shape of a handsome clock, wishing, as he said, "to express in some way more emphatic than by words, my sense of the many kindnesses I have received at your hands during the twenty years of our friendship. Remembrance of the things you have done in furtherance of my aims, and of the invaluable critical aid you have given me, with so much patience and at so much cost of time, has often made me feel how much I owe you."

After a generous reference to occasions when the warmth of debate might have betrayed him into more vigorous expressions than he intended, he concludes:—

But inadequately as I may ordinarily show it, you will (knowing that I am tolerably candid) believe me when I say that there is no one whose judgment on all subjects I so much respect, or whose friendship I so highly value.



It may be remembered that the 1872 address on "Administrative Nihilism" led to a reply from the pen of Mr. Spencer, as the champion of Individualism. When my father sent him the volume in which this address was printed, he wrote back a letter (Sept. 29, 1873) which is characterised by the same feeling. It expresses his thanks for the book, "and many more for the kind expression of feeling in the preface. If you had intended to set an example to the Philistines of the way in which controversial differences may be maintained without any decrease of sympathy, you could not have done it more perfectly."

In connection with the building of the house, Tyndall had advanced a sum of money to his friend, and with his usual generosity, not only received interest with the greatest reluctance, but would have liked to make a gift of the principal. He writes, "If I remain a bachelor I will circumvent you—if not—not. It cleaves to me like dirt—and that is why you wish to get rid of it." To this he received answer:—

*Feb. 26, 1873.*

I am not to be deterred by any amount of bribery and corruption, from bringing you under the yoke of a "rare and radiant,"—whenever I discover one competent to undertake the ticklish business of governing you. I hope she will be "radiant,"—uncommonly "rare" she certainly will be!

Two years later this loan was paid off, with the following letter:—

4 MARLBOROUGH PLACE, *Jan. II, 1875.*

MY DEAR OLD SHYLOCK—My argosies have come in, and here is all that was written in the bond! If you want the pound of flesh too, you know it is at your service, and my Portia won't raise that pettifogging objection to shedding a little blood into the bargain, which that other one did.—Ever yours faithfully,  
T. H. HUXLEY.

On October 24 Miss Jex Blake wrote to him to ask his help for herself and the other women medical students at Edinburgh. For two years they had only been able to get anatomical teaching in a mixed class; but wishing to have a separate class, at least for the present, they had tried to

arrange for one that session. The late demonstrator at the Surgeons' Hall, who had given them most of their teaching before, had undertaken to teach this separate class, but was refused recognition by the University Court, on the ground that they had no evidence of his qualifications, while refusing to let him prove his qualification by examination. This the women students understood to be an indirect means of suppressing their aspirations; they therefore begged Huxley to examine their instructor with a view to giving him a certificate which should carry weight with the University Court.

He replied:—

*Oct. 28, 1872.*

DEAR MADAM—While I fully sympathise with the efforts made by yourself and others, to obtain for women the education requisite to qualify them for medical practice, and while I think that women who have the inclination and the capacity to follow the profession of medicine are most unjustly dealt with if any obstacles beyond those which are natural and inevitable are placed in their way, I must nevertheless add, that I as completely sympathise with those Professors of Anatomy, Physiology, and Obstetrics, who object to teach such subjects to mixed classes of young men and women brought together without any further evidence of moral and mental fitness for such association than the payment of their fees.

In fact, with rare exceptions, I have refused to admit women to my own Lectures on Comparative Anatomy for many years past. But I should not hesitate to teach anything I know to a class composed of women; and I find it hard to believe that any one should really wish to prevent women from obtaining efficient separate instruction, and from being admitted to Examination for degrees upon the same terms as men.

You will therefore understand that I should be most glad to help you if I could—and it is with great regret that I feel myself compelled to refuse your request to examine Mr. H—.

In the first place I am in the midst of my own teaching, and with health not yet completely re-established I am obliged to keep clear of all unnecessary work. Secondly, such an examination must be practical, and I have neither dissecting-room available nor the anatomical license required for human dissection; and thirdly, it is not likely that the University authorities would attach much weight to my report on one or two

days' work—if the fact that Mr. H—— has already filled the office of anatomical Demonstrator (as I understand from you) does not satisfy them as to his competency.—I am, dear Madam, yours very faithfully,

T. H. HUXLEY

Miss S. JEX BLAKE.

The last event of the year was that he was elected by the students Lord Rector of Aberdeen University—a position, the duties of which consist partly in attending certain meetings of the University Court, but more especially in delivering an address. This, however, was not required for another twelvemonth, and the address on “Universities, Actual and Ideal,” was delivered in fulfilment of this duty on February 1874.

## CHAPTER XXVII

1873

THE year opens with a letter to Tyndall, then on a lecturing tour in America:—

4 MARLBOROUGH PLACE, ABBEY ROAD, N.W.,  
*January 1, 1872 [1873].*

MY DEAR TYNDALL—I cannot let this day go by without wishing you a happy New Year, and lamenting your absence from our customary dinner. But Hirst and Spencer and Michael Foster are coming, and they shall drink your health in champagne while I do the like in cold water, making up by the strength of my good wishes for the weakness of the beverage.

You see I write from the new house. Getting into it was an awful job, made worse than needful by the infamous weather we have had for weeks and months, and by the stupid delays of the workmen whom we had fairly to shove out at last as we came in. We are settling down by degrees, and shall be very comfortable by and by, though I do not suppose that we shall be able to use the drawing-room for two or three months to come. I am very glad to have made the change, but there is a drawback to everything in “this here wale,” as Mrs. Gamp says, and my present thorn in the flesh is a neighbour, who says I have injured him by certain operations in my garden, and is trying to get something out of me by Chancery proceedings. Fancy finding myself a defendant in Chancery!

It is particularly hard on me, as I have been especially careful to have nothing done without Burton’s sanction and assurance that I was quite safe in law; and I would have given up anything than have got into bother of this kind. But “sich is life.”

You seem to have been making a Royal Progress in Yankee-land. We have been uncommonly tickled with some of the

reports of your lectures which reached us, especially with that which spoke of your having "a strong English accent."

The loss of your assistant seems to have been the only deduction to be made from your success. I am afraid you must have felt it much in all ways.

"My Lord" received your telegram only after the business of "securing Hirst" was done. That is one of the bright spots in a bad year for me. Goschen consulted Spottiswoode and me independently about the headship of the new Naval College, and was naturally considerably surprised by the fact that we coincided in recommending Hirst. . . . The upshot was that Goschen asked me to communicate with Hirst and see if he would be disposed to accept the offer. So I did, and found to my great satisfaction that Hirst took to the notion very kindly. I am sure he is the very best man for the post to be met with in the three kingdoms, having that rare combination of qualities by which he gets on with all manner of men, and singularly attracts young fellows. He will not only do his duty, but be beloved for doing it, which is what few people can compass.

I have little news to give you. The tail of the X.-Hooker storm is drifting over the scientific sky in the shape of fresh attacks by Owen on Hooker. Hooker answered the last angelically, and I hope they are at an end.

The wife has just come in and sends her love (but is careful to add "second-best"). The chicks grow visibly and audibly, and Jess looks quite a woman. All are well except myself, and I am getting better from a fresh breakdown of dyspepsia. I find that if I am to exist at all it must be on strictly ascetic principles, so there is hope of my dying in the odour of sanctity yet. If you recollect, Lancelot did not know that he should "die a holy man" till rather late in life. I have forgotten to tell you about the Rectorship of Aberdeen. I refused to stand at first, on the score of health, and only consented on condition that I should not be called upon to do any public work until after the long vacation. It was a very hard fight, and although I had an absolute majority of over fifty, the mode of election is such that one vote, in one of the four nations, would have turned the scale by giving my opponent the majority in that nation. We should then have been ties, and as the chancellor, who has under such circumstances a casting vote, would have (I believe) given it against me, I should have been beaten.

As it is, the fact of anyone, who stinketh in the nostrils of orthodoxy, beating a Scotch peer at his own gates in the most

orthodox of Scotch cities, is a curious sign of the times. The reason why they made such a tremendous fight for me, is I believe, that I may carry on the reforms commenced by Grant Duff, my predecessor. Unlike other Lord Rectors, he of Aberdeen is a power and can practically govern the action of the University during his tenure of office.

I saw Pollock yesterday, and he says that they want you back again. Curiously the same desire is epidemically prevalent among your friends, not least here.—Ever yours,

T. H. HUXLEY.

In spite of his anxieties, his health was slowly improving under careful regimen. He published no scientific memoirs this year, but in addition to his regular lectures, he was working to finish his *Manual of Invertebrate Anatomy* and his *Introductory Primer*, and to write his Aberdeen address; he was also at work upon the *Pedigree of the Horse* and on *Bodily Motion and Consciousness*. He delivered a course to teachers on Psychology and Physiology, and was much occupied by the Royal Commission on Science. As a governor of Owens College he had various meetings to attend, though his duties did not extend, as some of his friends seem to have thought, to the appointment of a Professor of Physiology there.

My life (he writes to Sir Henry Roscoe) is becoming a burden to me because of —. Why I do not know, but for some reason people have taken it into their heads that I have something to do with appointments in Owens College, and no fewer than three men of whose opinion I think highly have spoken or written to me urging —'s merits very strongly.

This summer he again took a long holiday, thanks to the generosity of his friends (see p. 394), and with better results. He went with his old friend Hooker to the Auvergne, walking, geologising, sketching and gradually discarding doctor's orders. Sir Joseph Hooker has very kindly written me a letter from which I give an account of this trip:—

It was during the many excursions we took together, either by ourselves or with one of my boys, that I knew him best at his best; and especially during one of several weeks' duration in

the summer of 1873, which we spent in central France and Germany. He had been seriously ill, and was suffering from severe mental depression. For this he was ordered abroad by his physician, Sir A. Clark, to which step he offered a stubborn resistance. With Mrs. Huxley's approval, and being myself quite in the mood for a holiday, I volunteered to wrestle with him, and succeeded, holding out as an inducement a visit to the volcanic region of the Auvergne with Scrope's classical volume, which we both knew and admired, as a guide book.

We started on July 2nd, I loaded with injunctions from his physician as to what his patient was to eat, drink, and avoid, how much he was to sleep and rest, how little to talk and walk, etc., that would have made the expedition a perpetual burthen to me had I not believed that I knew enough of my friend's disposition and ailments to be convinced that not only health but happiness would be our companions throughout. Sure enough, for the first few days, including a short stay in Paris, his spirits were low indeed, but this gave me the opportunity of appreciating his remarkable command over himself and his ever-present consideration for his companion. Not a word or gesture of irritation ever escaped him; he exerted himself to obey the instructions laid down; nay, more, he was instant in his endeavour to save me trouble at hotels, railway stations, and ticket offices. Still, some mental recreation was required to expedite recovery, and he found it first by picking up at a bookstall, a *History of the Miracles of Lourdes*, which were then exciting the religious fervour of France, and the interest of her scientific public. He entered with enthusiasm into the subject, getting together all the treatises upon it, favourable or the reverse, that were accessible, and I need hardly add, soon arrived at the conclusion, that the so-called miracles were in part illusions and for the rest delusions. As it may interest some of your readers to know what his opinion was in this the early stage of the manifestations, I will give it as he gave it to me. It was a case of two peasant children sent in the hottest month of the year into a hot valley to collect sticks for firewood washed up by a stream, when one of them after stooping down opposite a heat-reverberating rock, was, in rising, attacked with a transient vertigo, under which she saw a figure in white against the rock. This bare fact being reported to the curé of the village, all the rest followed.

Soon after our arrival at Clermont Ferrand, your father had so far recovered his wonted elasticity of spirits that he took a keen interest in everything around, the museums, the cathedral,

where he enjoyed the conclusion of the service by a military band which gave selections from the *Figlia del Regimento*, but above all he appreciated the walks and drives to the geological features of the environs. He reluctantly refrained from ascending the Puy de Dome, but managed the Pic Parion, Gergovia, Royat, and other points of interest without fatigue. . . .

After Clermont they visited the other four great volcanic areas explored by Scrope, Mont Dore, the Cantal, Le Puy, and the valley of the Ardèche. Under the care of his friend, and relieved from the strain of work, my father's health rapidly improved. He felt no bad effects from a night at Mont Dore, when, owing to the crowd of invalids in the little town, no better accommodation could be found than a couple of planks in a cupboard. Next day they took up their quarters in an unpretentious cabaret at La Tour d'Auvergne, one of the villages on the slopes of the mountain, a few miles away.

Here (writes Sir J. Hooker), and for some time afterwards, on our further travels, we had many interesting and amusing experiences of rural life in the wilder parts of central France, its poverty, penury, and too often its inconceivable impositions and overcharges to foreigners, quite consistently with good feeling, politeness, and readiness to assist in many ways.

By the 10th of July, nine days after setting out, I felt satisfied (he continues) that your father was equal to an excursion upon which he had set his heart, to the top of the Pic de Sancy, 4000 feet above La Tour and 7 miles distant.

It was on this occasion that the friends made what they thought a new discovery, namely evidence of glacial action in central France. Besides striated stones in the fields or built into the walls, they noticed the glaciated appearance of one of the valleys descending from the peak, and especially some isolated gigantic masses of rock on an open part of the valley, several miles away, as to which they debated whether they were low buildings or transported blocks. Sir Joseph visited them next day, and found they were the latter, brought down from the upper part of the peak.\*

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\* He published an account of these blocks in *Nature*, xiii. 31, 166, but subsequently found that glaciation had been observed by von Lassaul in 1872 and by Sir William Guise in 1870.



Le Puy offered a special attraction apart from scenery and geology. In the museum was the skeleton of a prehistoric man that had been found in the breccia of the neighbourhood, associated with the remains of the rhinoceros, elephant, and other extinct mammals. My father's sketch-book contains drawings of these bones and of the ravine where they were discovered, although in spite of directions from M. Aymard, the curator, he could not find the exact spot. Under the sketch is a description of the remains, in which he notes, "The bones do not look fresher than some of those of *Elephas* and *Rhinoceros* in the same or adjacent cases."

As for the final stage of the excursion:—

After leaving the Ardèche (continues Sir J. Hooker), with no Scrope to lead or follow, our scientific ardours collapsed. We had vague views as to future travel. Whatever one proposed was unhesitatingly acceded to by the other. A more happy-go-lucky pair of idlers never joined company.

As will be seen from the following letters, they made their way to the Black Forest, where they stayed till Sir Joseph's duties called him back to England, and my mother came out to join my father for the rest of his holiday.\*

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\* You ask me (Sir Joseph adds) whether your father smoked on the occasion of this tour. Yes, he did, cigars in moderation. But the history of his addiction to tobacco that grew upon him later in life, dates from an earlier excursion that we took together, and I was the initiator of the practice. It happened in this wise: he had been suffering from what was supposed to be gastric irritation, and, being otherwise "run down," we agreed to go, in company with Sir John Lubbock, on a tour to visit the great monoliths of Brittany. This was in 1867. On arriving at Dinan he suffered so much that I recommended his trying a few cigarettes which I had with me. They acted as a charm, and this led to cigars, and finally, about 1875 I think, to the pipe. That he subsequently carried the use of tobacco to excess is, I think, unquestionable. I repeatedly remonstrated with him, at last I think (by backing his medical adviser) with effect.

I have never blamed myself for the "teaching him" to smoke, for the practice habitually palliated his distressing symptoms when nothing else did, nor can his chronic illness be attributed to the abuse of tobacco.

The following letters to Sir H. Roscoe and Dr. Tyndall were written during this tour:—

LE PUY, HAUTE LOIRE, FRANCE,  
*July 17, 1873.*

MY DEAR ROSCOE—Your very kind letter reached me just as I was in the hurry of getting away from England, and I have been carrying it about in my pocket ever since.

Hooker and I have been having a charming time of it among the volcanoes of the Auvergne, and we are now on our way to those of the Velay and Vivarrais. The weather has been almost perfect. Perhaps a few degrees of temperature could have been spared now and then, especially at Clermont, of which somebody once said that having stayed there the climate of hell would have no terrors for him.

It has been warm in the Mont Dore country and in the Cantal, as it is here, but we are very high up, and there is a charming freshness and purity about the air.

I do not expect to be back before the end of September, and my lectures begin somewhere in the second week of October. After they commence I shall not be able to leave London even for a day, but I shall be very glad to come to the inauguration of your new buildings if the ceremony falls within my possible time. And you know I am always glad to be your guest.

I am thriving wonderfully. Indeed all that plagues me now is my conscience, for idling about when I feel full of vigour. But I promised to be obedient, and I am behaving better than Auld Cloutie did when he fell sick.

I hope you are routing out the gout. This would be the place for you—any quantity of mineral waters.

Pray remember me very kindly to Mrs. Roscoe, and believe me, ever yours very faithfully,

T. H. HUXLEY.

HOTEL DE FRANCE, BADEN-BADEN,  
*July 30, 1873.*

MY DEAR TYNDALL—We find ourselves here after a very successful cruise in the Auvergne and Ardèche, successful at least so far as beauty and geological interest go. The heat was killing, and obliged us to give up all notion of going to Ursines, as we had at first intended to do. So we turned our faces north and made for Grenoble, hoping for a breath of cool air from the mountains of Dauphiny. But Grenoble was hotter even than

Clermont (which, by the way, quite deserves its reputation as a competitor with hell), a neighbour's drains were adrift close to the hotel, and we got poisoned before we could escape. Luckily we got off with nothing worse than a day or two's diarrhoea. After this the best thing seemed to be to rush northward to Gernsbach, which had been described to me as a sort of earthly paradise. We reached the place last Saturday night, and found ourselves in a big rambling hotel, crammed full of people, and planted in the bottom of a narrow valley, all hot and steaming. A large pigstye "convenient" to the house mingled its vapours with those of the seventy or eighty people who eat and drink without any other earthly occupation that we could discern during the three days we were bound, by stress of letters and dirty linen, to stop. On Monday we made an excursion over here, prospecting, and the air was so fresh and good, and things in general looked so promising that I made up my mind to put up in Baden-Baden until the wife joins me. She writes me that you talk of leaving England on Friday, and I may remark that Baden is on the high road to Switzerland.

*Verbum sap.*

I am wonderfully better, and really feel ashamed of loafing about when I might very well be at work. But I have promised to make holiday, and make holiday I will.

No proof of your answer to Forbes' biographer reached me before I left, so I suppose you had not received one in time. I am dying to see it out.

Hooker is down below, but I take upon myself to send his love. He is in great force now that he has got rid of his Grenoble mulligrubs.—Ever yours,

T. H. HUXLEY.

After parting company with Hooker, he paid a flying visit to Professor Bonnet at Geneva; then he was joined by his wife and son for the last three weeks of the holiday, which were spent at Baden and in the Bernese Oberland. Before this, he writes home:—

I feel quite a different man from what I was two months ago, and you will say that you have a much more creditable husband than the broken-down old fellow who has been a heart-ache to you so long, when you see me. The sooner you can get away the better. If the rest only does you as much good as it does me, I shall be very happy.

AXENSTEIN, LUZERNE, *Aug. 24, 1873.*

MY DEAR TYNDALL—The copies of your \*booklet\* intended for Hooker and me reached me just as I left Baden last Tuesday. Hooker had left me for home a fortnight before, and I hardly know whether to send his to Kew or keep them for him till return. I have read mine twice, and I think that nothing could be better than the tone you have adopted. I did not suspect that you had such a shot in your locker as the answer to Forbes about the direction of the "crevasses" referred to by Rendu. It is a deadly thrust; and I shall be curious to see what sort of parry the other side will attempt. For of course they will attempt something. Scotland is, I believe, the only country in the world in which you can bring an action for "putting to silence" an adversary who will go on with an obviously hopeless suit. The lawgivers knew the genius of the people; and it is to be regretted that they could not establish a process of the same sort in scientific matters.

I wrote to you a month ago to tell you how we had been getting on in France. Hooker and I were very jolly, notwithstanding the heat, and I think that the Vivarrais is the most instructive country in the world for seeing what water can do in cutting down the hardest rocks. Scrope's book is very good on the whole, though the pictures are a little overdone.

My wife and Leonard met me at Cologne on the 11th. Then we went on to Baden and rested till last Tuesday, when we journeyed to Luzerne and, getting out of that hot and unsavoury hole as fast as we could, came here last Thursday.

We find ourselves very well off. The hotel is perched up 18 feet above the lake, with a beautiful view of Pilatus on the west and of the Urner See on the south. On the north we have the Schwyz valley, so that we are not shut in, and the air is very good and fresh. There are plenty of long walks to be had without much fatigue, which suits the wife. Leonard promises to have very good legs of his own with plenty of staying power. I have given him one or two sharp walks, and I find he has plenty of vigour and endurance. But he is not thirteen yet and I do not mean to let him do overmuch, though we are bent on a visit to a glacier. I began to tell him something about the glaciers the other day, but I was promptly shut up with, "Oh yes! I know all about that. It's in Dr. Tyndall's book"—which said book he seems to me to have got by heart. He is

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\* "Principal Forbes and his Biographers."

the sweetest little fellow imaginable; and either he has developed immensely in the course of the last year, or I have never been so much thrown together with him alone, and have not had the opportunity of making him out.

You are a fatherly old bachelor, and will not think me a particularly great donkey for prattling on in this way about my swan, who probably to unprejudiced eyes has a power of goose about him.

I suppose you know that in company with yourself and Hooker, the paternal gander (T. H. H.) has been honoured by the King of Sweden and made into a Polar Goose by the order of the North Star. Hooker has explained to the Swedish Ambassador that English officials are prohibited by order in Council from accepting foreign orders, and I believe keeps the cross and ribbon on these conditions. If it were an ordinary decoration I should decline with thanks, but I am told it is a purely scientific and literary affair like the Prussian "pour le mérite"; so when I get back I shall follow Hooker's line.

I met Laugel on board the Luzerne steamboat the other day, and he told me that you were at the Belalp—gallivanting as usual, and likely to remain there for some time. So I send this on the chance of finding you. With best love from us all, ever yours,

T. H. HUXLEY.

I am as well as I ever was in my life—regularly set up—in token whereof I have shaved off my beard.

In another letter to his wife, dated August 8, from Baden, there is a very interesting passage about himself and his aims. He has just been speaking about his son's doings at school:—

I have been having a great deal of talk with myself about my future career too, and I have often thought over what you say in the letter you wrote to the Puy. I don't quite understand what — meant about the disputed reputation, unless it is a reputation for getting into disputes. But to say truth I am not greatly concerned about any reputation except that of being entirely honest and straightforward, and that reputation I think and hope I have.

For the rest . . . the part I have to play is not to found a new school of thought or to reconcile the antagonisms of the old schools. We are in the midst of a gigantic movement greater than that which preceded and produced the Reformation,

and really only the continuation of that movement. But there is nothing new in the ideas which lie at the bottom of the movement, nor is any reconciliation possible between free thought and traditional authority. One or other will have to succumb after a struggle of unknown duration, which will have as side issues vast political and social troubles. I have no more doubt that free thought will win in the long run than I have that I sit here writing to you, or that this free thought will organise itself into a coherent system, embracing human life and the world as one harmonious whole. But this organisation will be the work of generations of men, and those who further it most will be those who teach men to rest in no lie, and to rest in no verbal delusions. I may be able to help a little in this direction—perhaps I may have helped already. For the present, however, I am disposed to draw myself back entirely into my own branch of physical science. There is enough and to spare for me to do in that line, and, for years to come, I do not mean to be tempted out of it.

Strangely enough, this was the one thing he was destined not to do. Official work multiplied about him. From 1870 to 1884 only two years passed without his serving on one or two Royal Commissions. He was Secretary of the Royal Society from 1871 to 1880, and President from 1883 to his retirement, owing to ill-health, in 1885. He became Dean as well as Professor of Biology in the College of Science, and Inspector of Fisheries. Though he still managed to find some time for anatomical investigations, and would steal a precious hour or half hour by driving back from the Home Office to his laboratory at South Kensington before returning home to St. John's Wood, the amount of such work as he was able to publish could not be very great.

His most important contributions during this decennium (writes Sir M. Foster) were in part continuations of his former labours, such as the paper and subsequent full memoir on *Stagonolepis*, which appeared in 1875 and 1877, and papers on the Skull. The facts that he called a communication to the Royal Society, in 1875,\* on *Amphioxus*, a preliminary note, and that a paper read to the Zoological Society in 1876, on

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\* Written 1874.

Ceratodus Forsteri, was marked No. 1 of the series of Contributions to Morphology, showed that he still had before him the prospect of much anatomical work, to be accomplished when opportunity offered; but, alas! the opportunity which came was small, the preliminary note had no full successor, and No. 1 was only followed, and that after an interval of seven years, by a brief No. 2. A paper "On the Characters of the Pelvis," in the *Proceedings of the Royal Society*, in 1879, is full of suggestive thought, but its concluding passages seem to suggest that others, and not he himself, were to carry out the ideas. Most of the papers of this decennium deal with vertebrate morphology, and are more or less connected with his former researches, but in one respect, at least, he broke quite fresh ground. He had chosen the crayfish as one of the lessons for the class in general biology spoken of above, and was thus drawn into an interesting study of crayfishes, by which he was led to a novel and important analysis of the gill plumes as evidence of affinity and separation. He embodied the main results of his studies in a paper to the Zoological Society, and treated the whole subject in a more popular style in a book on the Crayfish. In a somewhat similar way, having taken the dog as an object lesson in mammalian anatomy for his students, he was led to a closer study of that common animal, resulting in papers on that subject to the Zoological Society in 1880, and in two lectures at the Royal Institution in 1880. He had intended so to develop this study of the dog as to make it tell the tale of mammalian morphology; but this purpose, too, remained unaccomplished.

Moreover, though he sent one paper (on *Hyperodapedon Gordoni*) to the Geological Society as late as 1887, yet the complete breakdown of his health in 1885, which released him from nearly all his official duties, at the same time dulled his ardour for anatomical pursuits. Stooping over his work became an impossibility.

Though he carried about him, as does every man of like calibre and experience, a heavy load of fragments of inquiry begun but never finished, and as heavy a load of ideas for promising investigations never so much as even touched, though his love of science and belief in it might never have wavered, though he never doubted the value of the results which further research would surely bring him, there was something working within

him which made his hand, when turned to anatomical science, so heavy that he could not lift it. Not even that which was so strong within him, the duty of fulfilling a promise, could bring him to the work. In his room at South Kensington, where for a quarter of a century he had laboured with such brilliant effect, there lay on his working table for months, indeed for years, partly dissected specimens of the rare and little studied marine animal, *Spirula*, of which he had promised to contribute an account to the Reports of the "Challenger" Expedition, and hard by lay the already engraven plates; there was still wanted nothing more than some further investigation and the working out of the results. But it seemed as if some hidden hands were always being stretched out to keep him from the task; and eventually another labourer had to complete it. (*Ibid.*)

The remaining letters of this year include several to Dr. Dohrn, which show the continued interest my father took in the great project of the Biological Station at Naples, which was carried through in spite of many difficulties. He had various books and proceedings of learned societies sent out at Dr. Dohrn's request (I omit the details) and proposed a scheme for raising funds towards completing the building when the contractor failed. The scheme, however, was not put into execution.

4 MARLBOROUGH PLACE, *Feb.* 24, 1873.

MY DEAR DOHRN—I was very glad to receive the fine sealed letter, and to get some news of you—though to be sure there is not much of you in the letter, but all is "Station, Station."

I congratulate you heartily on your success with your undertaking, and I only wish I could see England represented among the applicants for tables. But you see England is so poor, and the present price of coals obliges her to economise.

I envy you your visit from "Pater Anchises" Baer, and rejoice to hear that the grand old man is well and strong enough to entertain such a project. I wish I could see my way to doing the like. I have had a long bout of illness—ever since August—but I am now very much better, indeed, I hope I may say quite well. The weariness of all this has been complicated by the trouble of getting into a new house, and in addition a law-suit brought by a knavish neighbour, in the hope of extracting money out of me.

I am happy to say, however, that he has just been thoroughly and effectually defeated. It has been a new experience for me,



and I hope it may be my last as well as my first acquaintance with English law, which is a luxury of the most expensive character.

If Dr. Kleinenberg is with you, please to tell him, with my compliments and thanks for the copy of his Memoir, that I went over his Hydra paper pretty carefully in the summer, and satisfied myself as to the correctness of his statements about the structure of the ectoderm and about the longitudinal fibres. About the Endoderm I am not so clear, and I often found indications of delicate circular fibres in close apposition with the longitudinal ones. However, I had not time to work all this out, and perhaps might as well say nothing about it.

Pray make my very kind remembrances to Mr. Grant. I trust that his dramas may have a brilliant reception.

The Happy Family flourishes. But we shall look to your coming to see us. The house is big enough now to give you a bedroom, and you know you will have no lack of a welcome.

I have said nothing about my wife (who has been in a state not only of superhuman, but of superfeminine, activity for the last three months) meaning to leave her the last page to speak for herself.

With best compliments to the "ladies downstairs," ever  
yours very faithfully,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Oct. 17, 1873.*

MY DEAR DOHRN—Your letter reached me nearly a week ago, and I have been turning over its contents in my mind as well as I could, but have been able to come to no clear conclusion until now. I have been incessantly occupied with other things.

I will do for you, and gladly, anything I would do for myself, but I could not apply on my own behalf to any of those rich countrymen of mine, unless they were personally well known to me, and I had the opportunity of feeling my way with them. But if you are disposed to apply to any of the people you mention, I shall be only too glad to back your application with all the force I am master of. You may make use of my name to any extent as guarantor of the scientific value and importance of your undertaking and refer anyone to whom you may apply to me. It may be, in fact, that this is all you want, but as you have taken to the caprice of writing in my tongue instead of in that vernacular, idiomatic and characteristically Dohrnian German, in which I delight, I am not so sure about your meaning.

There is a rub for you. If you write to me in English again I will send the letter back without paying the postage.

In any case let me have a precise statement of your financial position. I may have a chance of talking to some Croesus, and the first question he is sure to ask me is—How am I to know that this is a stable affair, and that I am not throwing my money into the sea? . . .

(Referring to an unpleasant step it seemed necessary to take) . . . you must make up your mind to act decidedly and take the consequences. No good is ever done in this world by hesitation. . . .

I hope you are physically better. Look sharply after your diet, take exercise and defy the blue-devils, and you will weather the storm.—Ever yours very faithfully, T. H. HUXLEY.

Tyndall, who had not attended the 1873 meeting of the British Association, had heard that some local opposition had been offered to his election as President for the Belfast meeting in 1874, and had written:—

I wish to heaven you had not persuaded me to accept that Belfast duty. They do not want me. . . . But Spottiswoode assures me that no individual offered the slightest support to the two unscientific persons who showed opposition.

The following was written in reply:—

4 MARLBOROUGH PLACE, *Sept.* 25, 1873.

MY DEAR TYNDALL—I am sure you are mistaken about the Belfast people. That blundering idiot of —— wanted to make himself important and get up a sort of “Home Rule” agitation in the Association, but nobody backed him and he collapsed. I am at your disposition for whatever you want me to do, as you know, and I am sure Hooker is of the same mind. We shall not be ashamed when we meet our enemies in the gate.

The grace of God cannot entirely have deserted you since you are aware of the temperature of that ferocious epistle. Reeks,\* whom I saw yesterday, was luxuriating in it, and said (confound his impudence) that it was quite my style. I forgot to tell him, by the bye, that I had resigned in your favour ever since the famous letter to Carpenter. Well, so long as you are better after it there is no great harm done.

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\* The late Trenham Reeks, Registrar of the School of Mines, and Curator of the Museum of Practical Geology.

Somebody has sent me the two numbers of Scribner with Blauvelt's articles on "Modern Skepticism." They seem to be very well done, and he has a better appreciation of the toughness of the job before him than any of the writers of his school with whom I have met. But it is rather cool of you to talk of his pitching into Spencer when you are chief target yourself. I come in only *par parenthèse*, and I am glad to see that people are beginning to understand my real position, and to separate me from such raging infidels as you and Spencer.—Ever thine,  
T. H. HUXLEY.

He was unable to attend the opening of Owens College this autumn, and having received but a scanty account of the proceedings, wrote as follows:—

4 MARLBOROUGH PLACE, LONDON, N. W.,  
Oct. 16, 1873.

MY DEAR ROSCOE—I consider myself badly used. Nobody has sent me a Manchester paper with the proceedings of the day of inauguration when, I hear, great speeches were made.

I *did* get *two* papers containing your opening lecture, and the "Fragment of a Morality," for which I am duly grateful, but two copies of one day's proceedings are not the same thing as one copy of two days' proceedings, and I consider it is very disrespectful to a Governor (large G) not to let him know what went on.

By all accounts which have reached me it was a great success, and I congratulate you heartily. I only wish that I could have been there to see.—Ever yours very faithfully,  
T. H. HUXLEY.

The autumn brought a slow improvement in health—

I am travelling (he writes) between the two stations of dyspepsia and health thus (illustrated by a zigzag with "mean line ascending").

The sympathy of the convalescent appears in various letters to friends who were ill. Thus, in reply to Mr. Hyde Clarke, the philologist and, like himself, a member of the Ethnological Society, he writes:—

(Nov. 18, 1873)—I am glad to learn two things from your note—first, that you are getting better; second, that there is

hope of some good coming out of that Ashantee row, if only in the shape of rare vocables.

My attention is quite turned away from Anthropological matters at present, but I will bear your question in mind if opportunity offers.

A letter to Professor Rolleston at Oxford gives a lively account of his own ailments, which could only have been written by one now recovering from them, while the illness of another friend raised a delicate point of honour, which he laid before the judgment of Mr. Darwin, more especially as the latter had been primarily concerned in the case.

4 MARLBOROUGH PLACE, *Oct. 16, 1873.*

MY DEAR ROLLESTON—A note which came from Mrs. Rolleston to my wife the other day, kindly answering some inquiries of ours about the Oxford Middle Class Examination, gave us but a poor account of your health.

This kind of thing won't do, you know. Here is — ill, and I doing all I can to persuade him to go away and take care of himself, and now comes ill news of you.

Is it dyspeps again? If so follow in my steps. I mean to go about the country, with somebody who can lecture, as the "horrid example"—cured. Nothing but gross and disgusting intemperance, Sir, was the cause of all my evil. And now that I have been a teetotaller for nine months, and have cut down my food supply to about half of what I used to eat, the enemy is beaten.

I have carried my own permissive bill, and no canteen (except for my friends who still sit in darkness) is allowed on the premises. And as this is the third letter I have written before breakfast (a thing I never could achieve in the days when I wallowed in the sty of Epicurus), you perceive that I am as vigorous as ever I was in my life.

Let me have news of you, and believe me—Ever yours very faithfully,

T. H. H.

ATHENÆUM CLUB, *Nov. 3, 1873.*

MY DEAR DARWIN—You will have heard (in fact I think I mentioned the matter when I paid you my pleasant visit the other day) that — is ill and obliged to go away for six months to a warm climate. It is a great grief to me, as he is a man for whom I have great esteem and affection, apart from his

high scientific merits, and his symptoms are such as cause very grave anxiety. I shall be happily disappointed if that accursed consumption has not got hold of him.

The college authorities have behaved as well as they possibly could to him, and I do not suppose that his enforced retirement for a while gives him the least pecuniary anxiety as his people are all well off, and he himself has an income apart from his college pay. Nevertheless, under such circumstances, a man with half a dozen children always wants all the money he can lay hands on; and whether he does or no, he ought not to be allowed to deprive himself of any, which leads me to the gist of my letter. His name was on your list as one of those hearty friends who came to my rescue last year, and it was the only name which made me a little uneasy, for I doubted whether it was right for a man with his responsibilities to make sacrifices of this sort. However, I stifled that feeling, not seeing what else I could do without wounding him. But now my conscience won't let me be, and I do not think that any consideration ought to deter me from getting his contribution back to him somehow or other. There is no one to whose judgment on a point of honour I would defer more readily than yours, and I am quite sure you will agree with me. I really am quite unhappy and ashamed to think of myself as vigorous and well at the expense of his denying himself any rich man's caprice he might take a fancy to.

So, my dear, good friend, let me know what his contribution was, that I may get it back to him somehow or other, even if I go like Nicodemus privily and by night to his bankers.—Ever yours faithfully,

T. H. H.

## CHAPTER XXVIII

1874

My father's health continued fairly good in 1874, and while careful to avoid excessive strain he was able to undertake nearly as much as before his illness outside his regular work at South Kensington, the Royal Society, and on the Royal Commission. To this year belong three important essays, educational and philosophical. From February 25 to March 3 he was at Aberdeen, staying first with Professor Bain, afterwards with Mr. Webster, in fulfilment of his first duty as Lord Rector \* to deliver an address to the students. Taking as his subject "Universities, Actual and Ideal," he then proceeded to vindicate, historically and philosophically, the claims of natural science to take the place from which it had so long been ousted in the universal culture which a University professes to give. More especially he demanded an improved system of education in the medical school, a point to which he gave practical effect in the Council of the University.

In an ideal University, as I conceive it, a man should be able to obtain instruction in all forms of knowledge, and discipline in the use of all the methods by which knowledge is obtained. In such a University the force of living example should fire the student with a noble ambition to emulate the learning of learned men, and to follow in the footsteps of the explorers of new fields of knowledge. And the very air he breathes should be charged

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\* It may be noted that between 1860 and 1890 he and Professor Bain were the only Lord Rectors of Aberdeen University elected on non-political grounds.

Portrait from a Photograph by Elliott and Fry ;  
Steel Engraving in *Nature*, February 5, 1874.









with that enthusiasm for truth, that fanaticism of veracity, which is a greater possession than much learning; a nobler gift than the power of increasing knowledge; by so much greater and nobler than these, as the moral nature of man is greater than the intellectual; for veracity is the heart of morality. (*Coll. Ess.* iii, 189, *sqq.*)

As for the "so-called 'conflict of studies,'" he exclaims—

One might as well inquire which of the terms of a Rule of Three sum one ought to know in order to get a trustworthy result. Practical life is such a sum, in which your duty multiplied into your capacity and divided by your circumstances gives you the fourth term in the proportion, which is your deserts, with great accuracy.

The knowledge on which medical practice should be based is "the sort of practical, familiar, finger-end knowledge which a watchmaker has of a watch," the knowledge gained in the dissecting-room and laboratory,

Until each of the greater truths of anatomy and physiology has become an organic part of your minds—until you would know them if you were roused and questioned in the middle of the night, as a man knows the geography of his native place and the daily life of his home. That is the sort of knowledge which, once obtained, is a life-long possession. Other occupations may fill your minds—it may grow dim and seem to be forgotten—but there it is, like the inscription on a battered and defaced coin, which comes out when you warm it.

Hence the necessity to concentrate the attention on these cardinal truths, and to discard a number of extraneous subjects commonly supposed to be requisite whether for general culture of the medical student or to enable him to correct the possible mistakes of druggists. Against this "Latin fetish" in medical education, as he used to call it, he carried on a lifelong campaign, as may be gathered from his published essays on medical education, and from letters given in later chapters of this book. But there is another side to such limitation in professional training. Though literature is an essential in the preliminary, general education, culture is not solely dependent upon classics.

Moreover, I would urge that a thorough study of Human Physiology is in itself an education broader and more comprehensive than much that passes under that name. There is no side of the intellect which it does not call into play, no region of human knowledge into which either its roots or its branches do not extend; like the Atlantic between the Old and the New Worlds, its waves wash the shores of the two worlds of matter and of mind; its tributary streams flow from both; through its waters, as yet unfurrowed by the keel of any Columbus, lies the road, if such there be, from the one to the other; far away from that North-west Passage of mere speculation, in which so many brave souls have been hopelessly frozen up.

Of the address he writes to his wife, February 27:—

I have just come back from the hall in which the address was delivered, somewhat tired. The hall was very large, and contained, I suppose, a couple of thousand people, and the students made a terrific row at intervals, though they were quiet enough at times. As the address took me an hour and a half to deliver, and my voice has been very shaky ever since I have been here, I did not dare to put too much strain upon it, and I suspect that the people at the end of the hall could have heard very little. However, on the whole, it went off better than I expected.

And to Professor Baynes:—

I am very glad you liked my address. The students were abnormally quiet for the first half hour, and then made up for their reticence by a regular charivari for the rest of the time. However, I was consoled by hearing that they were much quieter than usual.

Dr. John Muir's appreciation is worth having. It did not occur to me that what I had to say would interest people out of Britain, but to my surprise I had an application from a German for permission to translate the address the other day.

Again to his wife, March 1:—

. . . I was considerably tired after my screed on Friday, but Bain and I took a long walk, and I was fresh again by dinner-time. I dined with the Senators at a hotel in the town, and of course had to make a speech or two. However I cut all that as fast as I could. They were all very apologetic for the row the students made. After the dinner one of the Professors came

to ask me if I would have any objection to attend service in the College Chapel on Sunday as the students would like it. I said I was quite ready to do anything it was customary for the Rector to do, and so this morning in half an hour's time I shall be enduring the pains and penalties of a Presbyterian service.

There was to have been another meeting of the University Court yesterday, but the Principal was suffering so much from an affection of the lungs that I adjourned the meeting till to-morrow. Did I tell you that I carried all my resolutions about improving the medical curriculum? Fact, though greatly to my astonishment. To-morrow we go in for some reforms in the arts curriculum, and I expect that the job will be tougher.

I send you a couple of papers—*Scotsman*, with a very good leading article, and the *Aberdeen Herald* also with a leading article, which is as much favourable as was to be expected. . . . The Websters are making me promise to bring you and one of the children here next autumn. They are wonderfully kind people.

*March 2.*—My work here finishes to-day. There is a meeting of the Council at one o'clock, and before that I am to go and look over laboratories and collections with sundry Professors. Then there is the supper at half-past eight and the inevitable speeches, for which I am not in the least inclined at present. I went officially to the College Chapel yesterday, and went through a Presbyterian service for the first time in my life. May it be the last!

Then to lunch at Professor Struthers' and back here for a small dinner party. I am standing it all well, for the weather is villanous and there is no getting any exercise. I shall leave here by the twelve o'clock train to-morrow.

On August 2 he delivered an address on "Joseph Priestley" (*Coll. Ess.* iii. 1), at Birmingham, on the occasion of the presentation of a statue of Priestley to that town. The biography of this pioneer of science and of political reform, who was persecuted for opinions that have in less than a century become commonplaces of orthodox thought, suggested a comparison between those times and this, and evoked a sincere if not very enthusiastic tribute to one who had laboured to better the world, not for the sake of worldly honour, but for the sake of truth and right.

As the way to Birmingham lay through Oxford, he was

asked by Professor Ray Lankester, then a Fellow of University College, if he could not break his journey there, and inspect the results of his investigations on Lymnæus. The answer was as follows:—

We go to Birmingham on Friday by the three o'clock train, but there is no chance of stopping at Oxford either going or coming, so that unless you bring a Lymnæus or two (under guise of periwinkles for refreshment) to the carriage door I shall not be able to see them.

The following letters refer both to this address on Priestley, and to the third of the important addresses of this year, that "On the Hypothesis that Animals are Automata, and its History" (*Coll. Ess.* i. 199, see also p. 442 below). The latter was delivered at Belfast before the British Association under Tyndall's presidency. It appears that only a month before, he had not so much as decided upon his subject—indeed, was thinking of something quite different.

The first allusion in these letters is to a concluding phase of Tyndall's controversy upon the claims of the late Principal Forbes in the matter of Glacier theory:—

4 MARLBOROUGH PLACE, LONDON, N.W.,

June 24, 1874.

MY DEAR TYNDALL—I quite agree with your Scotch friend in his estimate of Forbes, and if he were alive and the controversy beginning I should say draw your picture in your best sepia or lamp black. But I have been thinking over this matter a good deal since I received your letter, and my verdict is, leave that tempting piece of portraiture alone.

The world is neither wise nor just, but it makes up for all its folly and injustice by being damnably sentimental, and the more severely true your portrait might be the more loud would be the outcry against it. I should say publish a new edition of your *Glaciers of the Alps*, make a clear historical statement of all the facts showing Forbes's relations to Rendu and Agassiz, and leave the matter to the judgment of your contemporaries. That will sink in and remain when all the hurly-burly is over.

I wonder if that address is begun, and if you are going to be as wise and prudent as I was at Liverpool. When I think of the temptation I resisted on that occasion, like Clive when he was charged with peculation, "I marvel at my own forbearance!"

Let my example be a burning and a shining light to you. I declare I have horrid misgivings of your kicking over the traces.

The "x" comes off on Saturday next, so let your ears burn, for we shall be talking about you. I have just begun my lectures to Schoolmasters, and I wish they were over, though I am very well on the whole.

Griffith wrote to ask for the title of my lecture at Belfast, and I had to tell him I did not know yet. I shall not begin to think of it till the middle of July when these lectures are over.

The wife would send her love, but she has gone to Kew to one of Hooker's receptions, taking Miss Jewsbury,\* who is staying with us. I was to have gone to the College of Physicians' dinner to-night, but I was so weary when I got home that I made up my mind to send an excuse. And then came the thought that I had not written to you.—Ever yours sincerely,  
T. H. HUXLEY.

The following is in reply to Tyndall, who had written from Switzerland on July 15:—

I confess to you that I am far more anxious about your condition than about my own; for I fear that after your London labour the labour of this lecture will press heavily upon you. I wish to Heaven it could be transferred to other shoulders.

I wish I could get rid of the uncomfortable idea that I have drawn upon you at a time when your friend and brother ought to be anxious to spare you every labour. . . .

*P.S.*—Have just seen the *Swiss Times*; am intensely disgusted to find that while I was brooding over the calamities possibly consequent on your lending me a hand, that you have been at the Derby Statue, and are to make an oration apropos of the Priestley Statue in Birmingham on the 1st August!!!

4 MARLBOROUGH PLACE, LONDON, N.W.,  
July 22, 1874.

MY DEAR TYNDALL—I hope you have been taking more care of your instep than you did of your leg in old times. Don't try mortifying the flesh again.

I was uncommonly amused at your disgustful wind up after writing me such a compassionate letter. I am as jolly as a sandboy so long as I live on a minimum and drink no alcohol,

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\* Miss Geraldine Jewsbury (1812–80) the novelist, and friend of the Carlyles. After 1866 she lived at Sevenoaks.

and as vigorous as ever I was in my life. But a late dinner wakes up my demoniac colon and gives me a fit of blue devils with physical precision.

Don't believe that I am at all the places in which the newspapers put me. For example, I was not at the Lord Mayor's dinner last night. As for Lord Derby's statue, I wanted to get a lesson in the art of statue unveiling. I help to pay Dizzie's salary, so I don't see why I should not get a wrinkle from that artful dodger.

I plead guilty to having accepted the Birmingham invitation.\* I thought they deserved to be encouraged for having asked a man of science to do the job instead of some noble swell; and, moreover, Satan whispered that it would be a good opportunity for a little ventilation of wickedness. I cannot say, however, that I can work myself up into much enthusiasm for the dry old Unitarian who did not go very deep into anything. But I think I may make him a good peg whereon to hang a discourse on the tendencies of modern thought.

I was not at the Cambridge pow-wow—not out of prudence, but because I was not asked. I suppose that decent respect towards a secretary of the Royal Society was not strong enough to outweigh University objections to the incumbent of that office. It is well for me that I expect nothing from Oxford or Cambridge, having burned my ships so far as they were concerned long ago.

I sent your note on to Knowles as soon as it arrived, but I have heard nothing from him. I wrote to him again to-night to say that he had better let me see it in proof if he is going to print it. I am right glad you find anything worth reading again in my old papers. I stand by the view I took of the origin of species now as much as ever.

Shall I not see the address? It is tantalising to hear of your progress, and not to know what is in it.

I am thinking of taking Development for the subject of my evening lecture,† the concrete facts made out in the last thirty years without reference to Evolution. If people see that it is Evolution, that is Nature's fault, and not mine.

We are all flourishing, and send our love.—Ever yours faithfully,  
T. H. HUXLEY.

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\* To deliver the address at the opening of the Mason College. It was on Joseph Priestley.

† *i.e.* At the British Association, he actually took "Animals as Automata."



The paper on Animal Automatism is in effect an enlargement of a short paper read before the Metaphysical Society in 1871, under the title of "Has a Frog a Soul?" It begins with a vindication of Descartes as a great physiologist, doing for the physiology of motion and sensation that which Harvey had done for the circulation of the blood. A series of propositions which constitute the foundation and essence of the modern physiology of the nervous system, are fully expressed and illustrated in the writings of Descartes. Modern physiological research, which has shown that many apparently purposive acts are performed by animals, and even by men, deprived of consciousness, and therefore of volition, is at least compatible with the theory of automatism in animals, although the doctrine of continuity forbids the belief that "such complex phenomena as those of consciousness first make their appearance in man." And if the volitions of animals do not enter into the chain of causation of their actions at all, the fact lays at rest the question, "How is it possible to imagine that volition, which is a state of consciousness, and, as such, has not the slightest community of nature with matter in motion, can act upon the moving matter of which the body is composed, as it is assumed to do in voluntary acts?"

As for man, the argumentation, if sound, holds equally good. States of consciousness are immediately caused by molecular changes of the brain-substance, and our mental conditions are simply the symbols in consciousness of the changes which take place automatically in the organism.

As for the bugbear of the "logical consequences" of this conviction, "I may be permitted to remark (he says), that logical consequences are the scarecrows of fools and the beacons of wise men." And if St. Augustine, Calvin, and Jonathan Edwards have held in substance the view that men are conscious automata, to hold this view does not constitute a man a fatalist, a materialist, nor an atheist. And he takes occasion once more to declare that he ranks among none of these philosophers.

Not among fatalists, for I take the conception of necessity to have a logical, and not a physical foundation; not among ma-

terialists, for I am utterly incapable of conceiving the existence of matter if there is no mind in which to picture that existence; not among atheists, for the problem of the ultimate cause of existence is one which seems to me to be hopelessly out of reach of my poor powers. Of all the senseless babble I have ever had occasion to read, the demonstrations of these philosophers who undertake to tell us all about the nature of God would be the worst, if they were not surpassed by the still greater absurdities of the philosophers who try to prove that there is no God.

This essay was delivered as an evening address on August 24, the Monday of the Association week. A vast stir had been created by the treatment of deep reaching problems in Professor Tyndall's presidential address; interest was still further excited by this unexpected excursion into metaphysics. "I remember," writes Sir M. Foster, "having a talk with him about the lecture before he gave it. I think I went to his lodgings—and he sketched out what he was going to say. The question was whether, in view of the Tyndall row, it was wise in him to take the line he had marked out. In the end I remember his saying, 'Grasp your nettle, that is what I have got to do.'" But apart from the subject, the manner of the address struck the audience as a wonderful *tour de force*. The man who at first disliked public speaking, and always expected to break down on the platform, now, without note or reference of any kind, discoursed for an hour and a half upon a complex and difficult subject, in the very words which he had thought out and afterwards published.

This would have been a remarkable achievement if he had planned to do so and had learned up his speech; but the fact was that he was compelled to speak off-hand on the spur of the moment. He describes the situation in a letter of February 6, 1894, to Professor Ray Lankester:—

I knew that I was treading on very dangerous ground, so I wrote out uncommonly full and careful notes, and had them in my hand when I stepped on to the platform.

Then, I suddenly became aware of the bigness of the audience, and the conviction came upon me that, if I looked at my notes, not one half would hear me. It was a bad ten seconds,

but I made my election and turned the notes face downwards on the desk.

To this day, I do not exactly know how the thing managed to roll itself out; but it did, as you say, for the best part of an hour and a half.

There's a story *pour vous encourager* if you are ever in a like fix.

He writes home on August 20:—

Johnny's address went off exceedingly well last night. There was a mighty gathering in the Ulster Hall, and he delivered his speech very well. The meeting promises to be a good one, as there are over 1800 members already, and I daresay they will mount up to 2000 before the end. The Hookers' arrangements\* all went to smash as I rather expected they would, but I have a very good clean lodging well outside the town where I can be quiet if I like, and on the whole I think that is better, as I shall be able to work up my lectures in peace. . . .

August 21.—Everything is going on very well here. The weather is delightful, and under these circumstances my lodgings here with John Ball for a companion turns out to be a most excellent arrangement. I need not say that I was speaking more or less all day long. *Ça va sans dire*, though, by the way, that is a bull induced by the locality. I am not going on any of the excursions on Sunday. I am going to have a quiet day here when everybody will suppose that I have accepted everybody else's invitation to be somewhere else. The Ulster Hall, in which the addresses are delivered, seems to me to be a terrible room to speak in, and I mean to nurse my energies all Monday. I sent you a cutting from one of the papers containing an account of me that will amuse you. The writer is evidently disappointed that I am not a turbulent savage.

August 25:—

. . . My work is over and I start for Kingstown, where I mean to sleep to-night, in an hour. I have just sent you a full and excellent report of my lecture.† I am glad to say it was a complete success. I never was in better voice in my life, and I spoke for an hour and a half without notes, the people listening

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\* *i.e.* for the members of the  $\alpha$ -club and their wives to club together at Belfast.

† "On Animals as Automata"; see above.

as still as mice. There has been a great row about Tyndall's address, and I had some reason to expect that I should have to meet a frantically warlike audience. But it was quite otherwise, and though I spoke my mind with very great plainness I never had a warmer reception. And I am not without hope that I have done something to allay the storm, though, as you may be sure, I did not sacrifice plain speaking to that end. . . . I have been most creditably quiet here, and have gone to no dinners or breakfasts or other such fandangoes except those I accepted before leaving home. Sunday I spent quietly here, thinking over my lecture and putting my peroration, which required a good deal of care, into shape. I wandered out into the fields in the afternoon, and sat a long time thinking of all that had happened since I was here a young beginner, two and twenty, and . . . you were largely in my thoughts, which were full of blessings and tender memories.

I had a good night's work last night. I dined with the President of the College, then gave my lecture. After that I smoked a bit with Foster till eleven o'clock, and then I went to the *Northern Whig* office to see that the report of my lecture was all right. It is the best paper here, and the Editor had begged me to see to the report, and I was anxious myself that I should be rightly represented. So I sat there till a quarter past one having the report read and correcting it when necessary. Then I came home and got to bed about two. I have just been to the section and read my paper there to a large audience who cannot have understood ten words of it, but who looked highly edified, and now I have done. Our lodging has turned out admirably, and Ball's company has been very pleasant. So that the fiasco of our arrangements was all for the best.

I take the account of this last mentioned paper in Section D from the report in *Nature*:—

Professor Huxley opened the last day of the session with an account of his recent observations on the development of the *Columella auris* in Amphibia. (He described it as an outgrowth of the periotic capsule, and therefore unconnected with any visceral arch). . . .

In the absence of Mr. Parker there was no one competent to criticise the paper from personal knowledge; but a word dropped as to the many changes in the accepted homologies of the ossicula auditus, elicited a masterly and characteristic exposition of the series of new facts, and the modifications of the

theory they have led to, from Reichert's first observations down to the present time. The embryonic structures grew and shaped themselves on the board, and shifted their relations in accordance with the views of successive observers, until a graphic epitome of the progress of knowledge on the subject was completed.

He and Parker indeed (to whom he signs himself, "Ever yours amphibially") had been busy, not only throughout 1874, but for several years earlier, examining the development of the *Amphibia*, with a particular view to the whole theory of the vertebrate skull, for which he had done similar work in 1857 and 1858. Thus in May 4, 1870, he writes to Parker:—

I read all the most important part of your Frog-paper last night, and a grand piece of work it is—more important, I think, in all its bearings than anything you have done yet.

From which premisses I am going to draw a conclusion which you do not expect, namely, that the paper must by no manner of means go into the Royal Society in its present shape. And for the reasons following:—

In the first place, the style is ultra-Parkerian. From a literary point of view, my dear friend, you remind me of nothing so much as a dog going home. He has a goal before him which he will certainly reach sooner or later, but first he is on this side the road, and now on that; anon, he stops to scratch at an ancient rat-hole, or maybe he catches sight of another dog, a quarter of a mile behind, and bolts off to have a friendly, or inimical sniff. In fact, his course is . . . (here a tangled maze is drawn) not —. In the second place, you must begin with an earlier stage. . . . That is the logical starting-point of the whole affair.

Will you come and dine at 6 on Saturday, and talk over the whole business?

If you have drawings of earlier stages you might bring them. I suspect that what is wanted might be supplied in plenty of time to get the paper in.

In 1874 he re-dissects the skull of *Axolotl* to clear up the question as to the existence of the "ventral head or pedicle" which Parker failed to observe: "If you disbelieve in that pedicle again, I shall be guilty of an act of personal

violence." Later, "I am benevolent to all the world, being possessed of a dozen live axolotls and four or five big dead mesobranchs. Moreover, I am going to get endless Frogs and Toads by judicious exchange with Gunther. We will work up the Amphibia as they have not been done since they were crea—I mean evolved." \*

The question of the pedicle comes up again when he simplifies some of Parker's results as to the development of the *Columella auris* in the Frog. "Your suprahyomandibular is nothing but the pedicle of the suspensorium over again. It has nothing whatever to do with the columella auris. . . . The whole thing will come out as simply as possible without any of your coalescences and combotherations. How you will hate me and the pedicle."

Tracing the development of the *columella* was a long business, but it grew clearer as young frogs of various ages were examined. "Don't be aggravated with yourself," he writes to Parker in July, "it's tough work, this here Frog." And on August 5: "I have worked over Toad and I have worked over Frog, and I tell an obstinate man that s.h.m. (suprahyomandibular) is a figment—or a vessel, whichever said obstinate man pleases." The same letter contains what he calls his final views on the *columella*, but by the end of the year he has gone further, and writes:—

Be prepared to bust-up with all the envy of which your malignant nature is capable. The problem of the vertebrate skull is solved. Fourteen segments or thereabouts in *Amphioxus*; all but one (barring possibilities about the ear capsule) aborted in higher vertebrata. Skull and brain of *Amphioxus* shut up like an opera-hat in higher vertebrata. So! (Sketch in illustration).

P.S.—I am sure you will understand the whole affair from this. Probably published it already in *Nature*!

A letter to the *Times* of July 8, 1874, on women's education, was evoked by the following circumstances. Miss Jex Blake's difficulties in obtaining a medical education

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\* Dr. A. C. L. G. Gunther, of the British Museum, where he was appointed Keeper of the Department of Zoology in 1875.

have already been referred to (p. 415). A further discouragement was her rejection at the Edinburgh examination. Her papers, however, were referred to Huxley, who decided that certain answers were not up to the standard.

As Miss Jex Blake may possibly think that my decision was influenced by prejudice against her cause, allow me to add that such prejudice as I labour under lies in the opposite direction. Without seeing any reason to believe that women are, on the average, so strong physically, intellectually, or morally, as men, I cannot shut my eyes to the fact that many women are much better endowed in all these respects than many men, and I am at a loss to understand on what grounds of justice or public policy a career which is open to the weakest and most foolish of the male sex should be forcibly closed to women of vigour and capacity.

We have heard a great deal lately about the physical disabilities of women. Some of these alleged impediments, no doubt, are really inherent in their organisation, but nine-tenths of them are artificial—the products of their modes of life. I believe that nothing would tend so effectually to get rid of these creations of idleness, weariness, and that “over stimulation of the emotions” which, in plainer-spoken days, used to be called wantonness, than a fair share of healthy work, directed towards a definite object, combined with an equally fair share of healthy play, during the years of adolescence; and those who are best acquainted with the acquirements of an average medical practitioner will find it hardest to believe that the attempt to reach that standard is like to prove exhausting to an ordinarily intelligent and well-educated young woman.

The Marine Biological Station at Naples was still struggling for existence, and to my father's interest in it is due the following letter, one of several to Dr. Dohrn, whose marriage took place this summer:—

4 MARLBOROUGH PLACE, *June 24, 1874.*

MY DEAR DOHRN—Are you married yet or are you not? It is very awkward to congratulate a man upon what may not have happened to him, but I shall assume that you are a benedict, and send my own and my wife's and all the happy family's good wishes accordingly. May you have as good a wife and as much a “happy family” as I have, though I would advise you—the

hardness of the times being considered—to be satisfied with fewer than seven members thereof.

I hear excellent accounts of the progress of the Station from Lankester, and I hope that it is now set on its legs permanently. As for the English contribution, you must look upon it simply as the expression of the hearty goodwill of your many friends in the land of fogs, and of our strong feeling that where you had sacrificed so much for the cause of science, we were, as a matter of duty,—quite apart from goodwill to you personally—bound to do what we could, each according to his ability.

Darwin is, in all things, noble and generous—one of those people who think it a privilege to let him help. I know he was very pleased with what you said to him. He is working away at a new edition of the *Descent of Man*, for which I have given him some notes on the brain question.

And apropos of that how is your own particular brain? I back la belle M— against all the physicians in the world—even against mine own particular Æsculapius, Dr. Clark—to find the sovereignest remedy against the blue devils.

Let me hear from you—most abominable of correspondents as I am. And why don't you send Madame's photograph that you have promised?—Ever yours very faithfully,

T. H. HUXLEY.

Pray give my kind remembrances to your father.

4 MARLBOROUGH PLACE, *March 31, 1874.*

MY DEAR DARWIN—The brain business\* is more than half done, and I will soon polish it off and send it to you. We are going down to Folkestone for a week on Thursday, and I shall take it with me.

I do not know what is doing about Dohrn's business at present. Foster took it in hand, but the last time I heard he was waiting for reports from Dew and Balfour.

You have been very generous as always; and I hope that other folk may follow your example, but like yourself I am not sanguine.

I have had an *awfully* tempting offer to go to Yankee-land on a lecturing expedition, and I am seriously thinking of making an experiment next spring.

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\* A note on the brain in man and the apes for the second edition of the *Descent of Man*.



The chance of clearing two or three thousand pounds in as many months is not to be sneezed at by a *père de famille*. I am getting sick of the state of things here.—Ever yours faithfully,  
T. H. HUXLEY.

I have heard no more about the spirit photographs!

4 MARLBOROUGH PLACE, *April 16, 1874.*

MY DEAR DARWIN—Put my contribution into the smallest type possible, for it will be read by none but anatomists; and never mind where it goes.

I am glad you agree with me about the hand and foot and skull question. As Ward \* said of Mill's opinions, you can only account for the views of Messrs. — and Co. on the supposition of "grave personal sin" on their part.

I had a letter from Dohrn a day or two ago in which he tells me he has written to you. I suspect he has been very ill.

Let us know when you are in town, and believe me,—Ever yours very faithfully,  
T. H. HUXLEY.

The allusion in the letter of March 31, to certain "spirit photographs" refers to a series of these wonderful productions sent to him by a connection of Mr. Darwin's, who was interested in these matters, and to whom he replied, showing how the effect might have been produced by simple mechanical means.

It was at this gentleman's house that in January a carefully organised séance was held, at which my father was present incognito, so far as the medium was concerned, and on which he wrote the following report to Mr. Darwin, referred to in his *Life*, vol. iii. p. 187.

It must be noted that he had had fairly extensive experience of spiritualism; he had made regular experiments with Mrs. Haydon at his brother George's house (the paper on which these are recorded is undated, but it must have been before 1863); he was referred to as a disbeliever in an article in the *Pall Mall Gazette* during January 1869, as a sequel to which a correspondent sent him an account of the confessions of the Fox girls, who had started spiritualism forty years before. At the houses of other friends, he had

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\* W. G. Ward. (See p. 338.)

attended séances and met mediums, by whom he was most unfavourably impressed.

Moreover, when invited to join a committee of investigation into spiritualistic manifestations, he replied:—

I regret that I am unable to accept the invitation of the Committee of the Dialectical Society to co-operate with a committee for the investigation of "Spiritualism"; and for two reasons. In the first place, I have not time for such an inquiry, which would involve much trouble and (unless it were unlike all inquiries of that kind I have known) much annoyance. In the second place, I take no interest in the subject. The only case of "Spiritualism" I have had the opportunity of examining into for myself, was as gross an imposture as ever came under my notice. But supposing the phenomena to be genuine—they do not interest me. If anybody would endow me with the faculty of listening to the chatter of old women and curates in the nearest cathedral town, I should decline the privilege, having better things to do. And if the folk in the spiritual world do not talk more wisely and sensibly than their friends report them to do, I put them in the same category. The only good that I can see in the demonstration of the truth of "Spiritualism" is to furnish an additional argument against suicide. Better live a crossing-sweeper than die and be made to talk twaddle by a "medium" hired at a guinea a *séance*.\*

To the report above mentioned, Prof. G. Darwin, who also was present, added one or two notes and corrections.

#### REPORT ON SÉANCE

*Jan. 27, 1874.*

We met in a small room at the top of the house with a window capable of being completely darkened by a shutter and curtains opposite the door. A small light table with two flaps and four legs, unsteady and easily moved, occupied the middle of the room, leaving not much more than enough space for the chairs at the sides. There was a chair at each end, two chairs on the fireplace side, and one on the other. Mr. X (the medium) was seated in the chair at the door end, Mr. Y (the host) in

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\* Quoted from a review in the *Daily News*, October 17, 1871, of the Report on Spiritualism of the Committee of the London Dialectical Society.

the opposite chair, Mr. G. Darwin on the medium's right, Mr. Huxley on his left, Mr. Z between Mr. Huxley and Mr. Darwin. The table was small enough to allow these five people to rest their hands on it, linking them together. On the table was a guitar which lay obliquely across it, an accordion on the medium's side of the guitar, a couple of paper horns, a Japanese fan, a matchbox, and a candlestick with a candle.

At first the room was slightly darkened (leaving plenty of light from the window, however) and we all sat round for half an hour. My right foot was against the medium's left foot, and two fingers of my right hand had a good grip of the little finger of his left hand. I compared my hand (which is *not* small and *is* strong) with his, and was edified by its much greater massiveness and strength. (No, we didn't link until the darkness. G. D.)

G. D.'s left hand was, as I learn, linked with medium's right hand, and left foot on medium's left [right] foot.

We sat thus for half an hour as aforesaid and nothing happened.

The room was next thoroughly darkened by shutting the shutters and drawing the curtains. Nevertheless, by great good fortune I espied three points of light, coming from the lighted passage outside the door. One of these came beneath the door straight to my eye, the other two were on the wall (or on a press) obliquely opposite. By still greater good fortune, these three points of light had such a position in reference to my eye that they gave me three straight lines traversing and bounding the space in which the medium sat, and I at once saw that if medium moved his body forwards or backwards he must occult one of my three rays. While therefore taking care to feel his foot and keep a good grip of his hand, I fixed my eyes intently on rays A and B. For I felt sure that I could trust to G. D. keeping a sharp look-out on the right hand and foot; and so no instrument of motion was left to the medium but his body and head, the movements of which could not have been discernible in absolute darkness. Nothing happened for some time. At length a very well executed muscular twitching of the arm on my side began, and I amused myself by comparing it with the convulsions of a galvanised frog's leg, but at the same time kept a very bright look-out on my two rays A and B.

The twitchings ceased, and then after a little time A was shut out. B then became obscure, and A became visible. "Ho ho!" thought I, "Medium's head is well over the table. Now

we are going to have some manifestations." Immediately followed a noise obviously produced by the tumbling over of the accordion and some shifting of the position of the guitar. Next came a twanging—very slight, but of course very audible—of some of the strings, during which B was invisible. By and by B and A became visible again, and Medium's voice likewise showed that he had got back to his first position. But after he had returned to this position there was a noise of the guitar and other things on the table being stirred, and creeping noises like something light moving over the table. But no more actual twanging.

To my great disgust G. D. now began to remark that he saw two spots of light, which I suppose must have had the same origin as my rays A and B, and, moreover, that something occasionally occulted one or other of them. (Note: No, not till we changed places, G. H. D.) I blessed him for spoiling my game, but the effect was excellent. Nothing more happened. By and by, after some talk about these points of light, the medium suggested that this light was distracting, and that we had better shut it out. The suggestion was very dexterously and indirectly made, and was caught up more strongly (I think by Mr. Z). Anyhow, we agreed to stop out all light. The circle was broken, and the candle was lighted for this purpose. I then took occasion to observe that the guitar was turned round into the position noted in the margin, the end being near my left hand. On examining it I found a longish end of one of the catgut strings loose, and I found that by sweeping this end over the strings I could make quite as good twangs as we heard. I could have done this just as well with my mouth as with my hand—and I could have pulled the guitar about by the end of the catgut in my mouth and so have disturbed the other things—as they were disturbed.

Before the candle was lighted some discussion arose as to why the spirits would not do any better (started by Mr. Y and Mr. Z, I think), in which the medium joined. It appeared that (in the opinion of the spirits as interpreted by the medium) we were not quite rightly placed. When the discussion arose I made a bet with myself that the result would be that either I or G. D. would have to change places with somebody else. And I won my wager (I have just paid it with the remarkably good cigar I am now smoking). G. D. had to come round to my side, Mr. Z went to the end, and Mr. Y took G. D.'s place. "Good, Medium," said I to myself. "Now we shall see some-

thing." We were in pitch darkness, and all I could do was to bring my sense of touch to bear with extreme tension upon the medium's hand—still well in my grip.

Before long Medium became a good deal convulsed at intervals, and soon a dragging sound was heard, and Mr. Y told us that the arm-chair (mark its position) had moved up against his leg, and was shoving against him. By degrees the arm-chair became importunate, and by the manner of Mr. Y's remarks it was clear that his attention was entirely given to its movements.

Then I felt the fingers of the medium's left hand become tense—in such a manner as to show that the muscles of the left arm were contracting sympathetically with those of the other arm on which a considerable strain was evidently being put. Mr. Y's observations upon the eccentricities of the arm-chair became louder—a noise was heard as of the chair descending on the table and shoving the guitar before it (while at the same time, or just before, there was a crash of a falling thermometer), and the tension of the left arm ceased. The chair had got on to the table. Says the Medium to Mr. Y, "Your hand was against mine all the time." "Well, no," replied Mr. Y, "not quite. For a moment as the chair was coming up I don't think it was." But it was agreed that this momentary separation made no difference. I said nothing, but, like the parrot, thought the more. After this nothing further happened. But conversation went on, and more than once the medium was careful to point out that the chair came upon the table while his hand was really in contact with Mr. Y's.

G. D. will tell you if this is a fair statement of the facts. I believe it is, for my attention was on the stretch for those mortal two hours and a half, and I did not allow myself to be distracted from the main points in any way. My conclusion is that Mr. X is a cheat and an impostor, and I have no more doubt that he got Mr. Y to sit on his right hand, knowing from the turn of his conversation that it would be easy to distract his attention, and that he then moved the chair against Mr. Y with his leg, and finally coolly lifted (it) on to the table than that I am writing these lines.

T. H. H.

As Mr. G. Darwin wrote of the séance, "It has given me a lesson with respect to the worthlessness of evidence which I shall always remember, and besides will make me very difficult in trusting myself. Unless I had seen it, I could not have be-

lieved in the evidence of anyone with such perfect *bona fides* as Mr. Y being so worthless.

On receiving this report Mr. Darwin wrote (*Life*, ii. p. 188):—

Though the séance did tire you so much it was, I think, really worth the exertion, as the same sort of things are done at all the séances . . . and now to my mind an enormous weight of evidence would be requisite to make me believe in anything beyond mere trickery.

The following letter to Mr. Morley, then editor of the *Fortnightly Review*, shows that my father was already thinking of writing upon Hume, though he did not carry out this intention till 1878.

The article referred to in the second letter is that on animals as automata.

4 MARLBOROUGH PLACE, N.W., June 4, 1874.

MY DEAR MR. MORLEY—I assure you that it was a great disappointment to me not to be able to visit you, but we had an engagement of some standing for Oxford.

Hume is frightfully tempting—I thought so only the other day when I saw the new edition advertised—and now I would gladly write about him in the *Fortnightly* if I were only sure of being able to keep any engagement to that effect I might make.

But I have yet a course of lectures before me, and an evening discourse to deliver at the British Association—to say nothing of opening the Manchester Medical School in October—and polishing off a lot of scientific work. So you see I have not a chance of writing about Hume for months to come, and you had much better not trust to such a very questionable reed as I am.—Ever yours very faithfully,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., Nov. 15, 1874.

MY DEAR MORLEY—Many thanks for your abundantly sufficient cheque—rather too much, I think, for an article which had been gutted by the newspapers.

I am always very glad to have anything of mine in the *Fortnightly*, as it is sure to be in good company; but I am becoming as spoiled as a maiden with many wooers. However, as far as the *Fortnightly* which is my old love, and the *Contemporary*

which is my new, are concerned, I hope to remain as constant as a persistent bigamist can be said to be.

It will give me great pleasure to dine with you, and Dec. 1 will suit me excellently well.—Ever yours very faithfully,  
T. H. HUXLEY.

The year winds up with a New Year's greeting to Professor Haeckel.

4 MARLBOROUGH PLACE, LONDON, N.W.,  
Dec. 28, 1874.

MY DEAR HAECKEL—This must reach you in time to wish you and yours a happy New Year in English fashion. May your shadow never be less, and may all your enemies, unbelieving dogs who resist the Prophet of Evolution, be defiled by the sitting of jackasses upon their grandmothers' graves! an oriental wish appropriate to an ex-traveller in Egypt.

I have written a notice of the "Anthropogenie" for the Academy, but I am so busy that I am afraid I should never have done it—but for being put into a great passion—by an article in the *Quarterly Review* for last July, which I read only a few days ago. My friend Mr. —, to whom I had to administer a gentle punishment some time ago, has been at the same tricks again, but much worse than his former performance—you will see that I have dealt with as you deal with a "Pfaiffe."\* There are "halb-Pfaffen" as well as "halb-Affen."† So if what I say about "Anthropogenie" seems very little—to what I say about the *Quarterly Review*—do not be offended. It will all serve the good cause.

I have been working very hard lately at the lower vertebrata, and getting out results which will interest you greatly. Your suggestion that Rathke's canals in *Amphioxus*‡ are the Wolffian ducts was a capital shot, but it just missed the mark because Rathke's canals do not exist. Nevertheless there are two half canals, the dorsal walls of which meet in the raphe described by Stieda, and the plaited lining of this wall (*a*) is, I believe, the renal organ. Moreover, I have found the skull and brain of *Amphioxus*, both of which are very large (like a vertebrate embryo's) instead of being rudimentary as we all have thought, and exhibit the primitive segmentation of the "Urwirbelthier" \* skull.

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\* Parson.

† Lit. half-apes; the Prosimiæ and Lemurs.

‡ The Lancelet.

\* Primitive vertebrate.

Thus the skull of *Petromyzon* answers to about fourteen segments of the body of *Amphioxus*, fused together and indistinguishable in even the earliest embryonic state of the higher vertebrata.

Does this take your breath away? Well, in due time you shall be convinced. I sent in a brief notice to the last meeting of the Royal Society, which will soon be in your hands.

I need not tell you of the importance of all this. It is unlucky for Semper that he has just put *Amphioxus* out of the *Vertebrata* altogether—because it is demonstrable that *Amphioxus* is nearer than could have been hoped to the condition of the primitive vertebrate—a far more regular and respectable sort of ancestor than even you suspected. For you see “Acrania” will have to go.

I think we must have an English translation of the *Anthropogenie*. There is great interest in these questions now, and your book is very readable, to say nothing of its higher qualities.

My wife (who sends her kindest greetings) and I were charmed with the photograph. [As for our] publication in that direction, the seven volumes are growing into stately folios. You would not know them.—Ever yours very faithfully,

T. H. HUXLEY.

How will you read this scrawl now that Gegenbaur is gone?

In the article here referred to, a review of a book by Prof. G. H. Darwin, a personal attack of an unjustifiable character was made upon him, and through him, upon Charles Darwin. The authorship of the review in question had come to be known, and Huxley writes to his friend:—

I entirely sympathise with your feeling about the attack on George. If anybody tries that on with my boy L., the old wolf will show all the fangs he has left by that time, depend upon it. . . .

You ought to be like one of the blessed gods of Elysium, and let the inferior deities do battle with the infernal powers. Moreover, the severest and most effectual punishment for this sort of moral assassination is quietly to ignore the offender and give him the cold shoulder. He knows why he gets it, and society comes to know why, and though society is more or less of a dunderhead it has honourable instincts, and the man in the cold finds no cloak that will cover him.



## CHAPTER XXIX

1875-1876

IN the year 1875 the bitter agitation directed against experimental physiology came to a head. It had existed in England for several years. In 1870, when President of the British Association, Huxley had been violently attacked for speaking in defence of Brown Séquard, the French physiologist. The name of vivisection, indifferently applied to all experiments on animals, whether carried out by the use of the knife or not, had, as Dr. (afterwards Sir) William Smith put it, the opposite effect on many minds to that of the "blessed word Mesopotamia." Misrepresentation was rife even among the most estimable and well-meaning of the opponents of vivisection, because they fancied they saw traces of the practice everywhere, all the more, perhaps, for not having sufficient technical knowledge for proper discrimination. One of the most flagrant instances of this kind of thing was a letter in the *Record* charging Huxley with advocating vivisections before children, if not by them. Passages from the Introduction to his *Elementary Physiology*, urging that beginners should be shown the structures under discussion, examples for which could easily be provided from the domestic animals, were put side by side with later passages in the book, such, for instance, as statements of fact as to the behaviour of severed nerves under irritation. A sinister inference was drawn from this combination, and published as fact without further verification. Of this he remarks emphatically in his address on "Elementary Instruction in Physiology," 1877 (*Collected Essays*, iii. 300):

It is, I hope, unnecessary for me to give a formal contradiction to the silly fiction, which is assiduously circulated by the fanatics who not only ought to know, but do know, that their assertions are untrue, that I have advocated the introduction of that experimental discipline which is absolutely indispensable to the professed physiologist, into elementary teaching.

Moreover, during the debates on the Vivisection Bill in 1876, the late Lord Shaftesbury made use of this story. Huxley was extremely indignant, and wrote home:—

Did you see Lord Shaftesbury's speech in Tuesday's *Times*? I saw it by chance,\* and have written a sharp letter to the *Times*.

This letter appeared on May 26, when he wrote again:—

You will have had my note, and know all about Lord Shaftesbury and his lies by this time. Surely you could not imagine on any authority that I was such an idiot as to recommend boys and girls to perform experiments which are difficult to skilled anatomists, to say nothing of other reasons.

#### LETTER TO THE *TIMES*

In your account of the late debate in the House of Lords on the Vivisection Bill, Lord Shaftesbury is reported to have said that in my *Lessons in Elementary Physiology*, it is strongly insisted that such experiments as those subjoined shall not merely be studied in the manual, but actually repeated, either by the boys and girls themselves or else by the teachers in their presence, as plainly appears from the preface to the second edition.

I beg leave to give the most emphatic and unqualified contradiction to this assertion, for which there is not a shadow of justification either in the preface to the second edition of my *Lessons* or in anything I have ever said or written elsewhere. The most important paragraph of the preface which is the subject of Lord Shaftesbury's misquotation and misrepresentation stands as follows:—

“For the purpose of acquiring a practical, though elementary, acquaintance with physiological anatomy and his-

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\* Being in Edinburgh, he had been reading the Scotch papers, and “the reports of the Scotch papers as to what takes place in Parliament are meagre.”

tology, the organs and tissues of the commonest domestic animals afford ample materials. The principal points in the structure and mechanism of the heart, the lungs, the kidneys, or the eye of man may be perfectly illustrated by the corresponding parts of a sheep; while the phenomena of the circulation, many of the most important properties of living tissues are better shown by the common frog than by any of the higher animals."

If Lord Shaftesbury had the slightest theoretical or practical acquaintance with the subject about which he is so anxious to legislate, he would know that physiological anatomy is not exactly the same thing as experimental physiology; and he would be aware that the recommendations of the paragraph I have quoted might be fully carried into effect without the performance of even a solitary "vivisection." The assertion that I have ever suggested or desired the introduction of vivisection into the teaching of elementary physiology in schools, is, I repeat, contrary to fact.

On the next day (May 27) appeared a reply from Lord Shaftesbury, in which his entire good faith is equally conspicuous with his misapprehension of the subject.

#### LORD SHAFTESBURY'S REPLY

The letter from Professor Huxley in the *Times* of this morning demands an immediate reply.

The object that I supposed the learned professor had in view was gathered from the prefaces to the several editions of his work on *Elementary Physiology*.

The preface to the first edition states that "the following lessons in elementary physiology are, primarily, intended to serve the purpose of a text-book for teachers and learners in boys' and girls' schools."

It was published, therefore, as a manual for the young, as well as the old.

Now, any reader of the preface to the first edition would have come to the conclusion that teachers and learners could acquire something solid, and worth having, from the text-book before them. But the preface to the second edition nearly destroys that expectation. Here is the passage:—"It will be well for those who attempt to study elementary physiology to bear in mind the important truth that the knowledge of science

which is attainable by mere reading, though infinitely better than ignorance, is knowledge of a very different kind from that which arises from direct contact with fact."

"Direct contact with fact!" What can that mean (so, at least, very many ask) but a declaration, on high authority, to teachers and learners that vivisection alone can give them any real and effective instruction?

But the subsequent passage is still stronger, for it states "that the worth of the pursuit of science, as an intellectual discipline, is almost lost by those who only seek it in books."

Is not language like this calculated to touch the zeal and vanity of teachers and learners at the very quick, and urge them to improve their own minds and stand well in the eyes of the profession and the public by positive progress in experimental physiology? Ordinary readers, most people would think, could come to no other conclusion.

But a disclaimer from Professor Huxley is enough; I am sorry to have misunderstood him; and I must ask his pardon. I sincerely rejoice to have received such an assurance that his great name shall never be used for such a project as that which excited our fears.

On this he wrote:—

You will have seen Lord Shaftesbury's reply to my letter. I thought it frank and straightforward, and I have written a private letter\* to the old boy of a placable and proper character.

In 1874 he had also had a small passage of arms with the late Mr. W. E. Forster, then Vice-President of the Council, upon the same subject. Mr. Forster was about to leave office, and when he gave his official authorisation for summer courses of lectures at South Kensington on Biology, Chemistry, Geology, etc., he did so with the special proviso that there be no vivisection experiments in any of the courses, and further, appended a Memorandum, explaining the reasons on which he acted.

Now, although Huxley was mentioned by name as having taken care to avoid inflicting pain in certain previous

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\* "Huxley, the Professor, has written me a very civil, nay kind, letter. I replied in the same spirit." (Lord Shaftesbury, *Life and Work*, iii. 373, June 3, 1876.)

experiments which had come to Mr. Forster's knowledge, the memorandum evoked from him a strong protest to the Lord President, to whom, as Mr. Forster expressly intimated, an appeal might properly be made.

To begin with, the memorandum contained a mistake in fact, referring to his regular course at South Kensington, experiments which had taken place two years before at one of the Courses to Teachers. This course was non-official; Huxley's position in it was simply that of a private person to whom the Department offered a contract, subject to official control and criticism, so far as touched that course, and entirely apart from his regular position at the School of Mines. The experiments of 1872 were performed, as he had reason to believe, with the full sanction of the Department. If the Board chose to go back upon what had happened two years before, he was of course subject to their criticism, but then he ought in justice to be allowed to explain in what these experiments really consisted. What they were, appears from a note to Sir J. Donnelly:—

MY DEAR DONNELLY—It will be the best course, perhaps, if I set down in writing what I have to say respecting the vivisections for physiological purposes which have been performed here, and concerning which you made me a communication from the Vice-President of the Council this morning.

I have always felt it my duty to defend those physiologists who, like Brown Séquard, by making experiments on living animals, have added immensely not only to scientific physiology, but to the means of alleviating human suffering, against the often ignorant and sometimes malicious clamour which has been raised against them.

But personally, indeed I may say constitutionally, the performance of experiments upon living and conscious animals is extremely disagreeable to me, and I have never followed any line of investigation in which such experiments are required.

When the course of instruction in Physiology here was commenced, the question of giving experimental demonstrations became a matter of anxious consideration with me. It was clear that, without such demonstrations, the subject could not be properly taught. It was no less clear from what had happened to me when, as President of the British Association, I had de-

fended Brown Séquard, that I might expect to meet with every description of abuse and misrepresentation if such demonstrations were given.

It did not appear to me, however, that the latter consideration ought to weigh with me, and I took such a course as I believe is defensible against everything but misrepresentation.

I gave strict instructions to the Demonstrators who assisted me that no such experiments were to be performed, unless the animal were previously rendered insensible to pain either by destruction of the brain or by the administration of anæsthetics, and I have every reason to believe that my instructions were carried out. I do not see what I can do beyond this, or how I can give Mr. Forster any better guarantee than is given in my assurance that my dislike to the infliction of pain both as a matter of principle and of feeling is quite as strong as his own can be.

If Mr. Forster is not satisfied with this assurance, and with its practical result that our experiments are made only on non-sentient animals, then I am afraid that my position as teacher of Physiology must come to an end.

If I am to act in that capacity I cannot consent to be prohibited from showing the circulation in a frog's foot because the frog is made slightly uncomfortable by being tied up for that purpose; nor from showing the fundamental properties of nerves, because extirpating the brain of the same animal inflicts one-thousandth part of the prolonged suffering which it undergoes when it makes its natural exit from the world by being slowly forced down the throat of a duck, and crushed and asphyxiated in that creature's stomach.

I shall be very glad to wait upon Mr. Forster if he desires to see me. Of course I am most anxious to meet his views as far as I can, consistently with my position as a person bound to teach properly any subject in which he undertakes to give instruction. But I am quite clear as to the amount of freedom of action which it is necessary I should retain, and if you will kindly communicate the contents of this letter to the Vice-President of the Council, he will be able to judge for himself how far his sense of what is right will leave me that freedom, or render it necessary for me to withdraw from what I should regard as a false position.

But there was a further and more vital question. He had already declared through Major (now Sir John) Don-

nelly, that he would only undertake a course which involved no vivisection. Further to require an official assurance that he would not do that which he had explicitly affirmed he did not intend to do, affected him personally, and he therefore declined the proposal made to him to give the course in question.

It followed from the fact that experiments on animals formed no part of his official course, and from his refusal under the circumstances to undertake the non-official course, that his opinions and present practices in regard to the question of vivisection, did not come under their Lordships' jurisdiction, and he protested against the introduction of his name, and of the approbation or disapprobation of his views, into an official document relating to a matter with which he had nothing to do.

In an intermediate paragraph of the same document, he could not resist asking for an official definition of vivisection as forbidden, in its relation to the experiments he had made to the class of teachers.

I should have to ask whether it means that the teacher who has undertaken to perform no "vivisection experiments" is thereby debarred from inflicting pain, however slight, in order to observe the action of living matter; for it might be said to be unworthy quibbling, if, having accepted the conditions of the minute, he thought himself at liberty to inflict any amount of pain, so long as he did not actually cut.

But if such is the meaning officially attached to the word "vivisection," the teacher would be debarred from showing the circulation in a frog's foot or in a tadpole's tail; he must not show an animalcule, uncomfortably fixed under the microscope, nor prick his own finger for the sake of obtaining a drop of living blood. The living particles which float in that liquid undoubtedly feel as much (or as little) as a frog under the influence of anæsthetics, or deprived of its brain, does; and the teacher who shows his pupils the wonderful phenomena exhibited by dying blood, might be charged with gloating over the agonies of the colourless corpuscles, with quite as much justice as I have been charged with inciting boys and girls to cruelty by describing the results of physiological experiments, which they are as likely to attempt as they are to determine the longitude of their schoolroom.

However, I will not trouble your Lordship with any further indication of the difficulties which, as I imagine, will attend the attempt to carry the Minute into operation, if instruction is to be given in Physiology, or even in general Biology.

The upshot of the matter was that the Minute was altered so as to refer solely to future courses, and on February 20 he wrote to Mr. Forster:—

I cannot allow you to leave office without troubling you with the expression of my thanks for the very great kindness and consideration which I have received from you on all occasions, and particularly in regard to the question of vivisection, on which I ventured to some extent, though I think not very widely or really, to differ from you.

The modification which you were good enough to make in your minute removed all my objections to undertaking the Summer Course.

And I am sure that if that course had happened to be a physiological one I could do all I want to do in the way of experiment, without infringing the spirit of your minute, though I confess that the letter of it would cause me more perplexity.

As to his general attitude to the subject, it must be noted, as said above in the letter to Sir J. Donnelly, that he never followed any line of research involving experiments on living and conscious animals. Though, as will be seen from various letters, he considered such experiments justifiable, his personal feelings prevented him from performing them himself. Like Charles Darwin, he was very fond of animals, and our pets in London found in him an indulgent master.

But if he did not care to undertake such experiments personally, he held it false sentiment to blame others who did disagreeable work for the good of humanity, and false logic to allow pain to be inflicted in the cause of sport while forbidding it for the cause of science. (See his address on "Instruction in Elementary Physiology," *Coll. Essays*, iii. 300 *seq.*) Indeed, he declared that he trusted to the fox-hunting instincts of the House of Commons rather than to any real interest in science in that body, for a moderate treatment of the question of vivisection.



The subject is again dealt with in "The Progress of Science," 1887 (*Coll. Essays*, i. 122 *seq*), from which I may quote two sentences:—

The history of all branches of science proves that they must attain a considerable stage of development before they yield practical "fruits"; and this is eminently true of physiology.

Unless the fanaticism of philozoic sentiment overpowers the voice of humanity, and the love of dogs and cats supersedes that of one's neighbour, the progress of experimental physiology and pathology will, indubitably, in course of time, place medicine and hygiene upon a rational basis.

The dangers of prohibition by law are discussed in a letter to Sir W. Harcourt:—

You wish me to say what, in my opinion, would be the effect of the total suppression of experiments on living animals on the progress of physiological science in this country.

I have no hesitation in replying that it would almost entirely arrest that progress. Indeed, it is obvious that such an effect must follow the measure, for a man can no more develop a true conception of living action out of his inner consciousness than he can that of a camel. Observation and experiment alone can give us a real foundation for any kind of Natural Knowledge, and any one who is acquainted with the history of science is aware that not a single one of all the great truths of modern physiology has been established otherwise than by experiment on living things.

Happily the abolition of physiological experiment in this country, should such a fatal legislative mistake ever be made, will be powerless to arrest the progress of science elsewhere. But we shall import our physiology as we do our hock and our claret from Germany and France; those of our young physiologists and pathologists who can afford to travel will carry on their researches in Paris and in Berlin, where they will be under no restraint whatever, or it may be that the foreign laboratories will carry out the investigations devised here by the few persons who have the courage, in spite of all obstacles, to attempt to save British science from extinction.

I doubt if such a result will contribute to the diminution of animal suffering. I am sure that it will do as much harm as anything can do to the English school of Physiology, Pathology,

and Pharmacology, and therefore to the progress of rational medicine.

Another letter on the subject may be given, which was written to a student at a theological college, in reply to a request for his opinion on vivisection, which was to be discussed at the college debating society.

GRAND HOTEL, EASTBOURNE, *Sept.* 29, 1890.

DEAR SIR—I am of the opinion that the practice of performing experiments on living animals is not only reconcilable with true humanity, but under certain circumstances is imperatively demanded by it.

Experiments on living animals are of two kinds. First, those which are made upon animals which, although living, are incapable of sensation, in consequence of the destruction or the paralysis of the sentient machinery.

I am not aware that the propriety of performing experiments of this kind is seriously questioned, except in so far as they may involve some antecedent or subsequent suffering. Of course those who deny that under any circumstances it can be right to inflict suffering on other sentient beings for our own good, must object to even this much of what they call cruelty. And when they prove their sincerity by leaving off animal food; by objecting to drive castrated horses, or indeed to employ animal labour at all; and by refusing to destroy rats, mice, fleas, bugs and other sentient vermin, they may expect sensible people to listen to them, and sincere people to think them other than sentimental hypocrites.

As to experiments of the second kind, which do not admit of the paralysis of the sentient mechanism, and the performance of which involves severe prolonged suffering to the more sensitive among the higher animals, I should be sorry to make any sweeping assertion. I am aware of a strong personal dislike to them, which tends to warp my judgment, and I am prepared to make any allowance for those who, carried away by still more intense dislike, would utterly prohibit these experiments.

But it has been my duty to give prolonged and careful attention to this subject, and putting natural sympathy aside, to try and get at the rights and wrongs of the business from a higher point of view, namely, that of humanity, which is often very different from that of emotional sentiment.

I ask myself—suppose you knew that by inflicting prolonged

pain on 100 rabbits you could discover a way to the extirpation of leprosy, or consumption, or locomotor ataxy, or of siccidal melancholia among human beings, dare you refuse to inflict that pain? Now I am quite unable to say that I dare. That sort of daring would seem to me to be extreme moral cowardice, to involve gross inconsistency.

For the advantage and protection of society, we all agree to inflict pain upon man—pain of the most prolonged and acute character—in our prisons, and on our battlefields. If England were invaded, we should have no hesitation about inflicting the maximum of suffering upon our invaders for no other object than our own good.

But if the good of society and of a nation is a sufficient plea for inflicting pain on men, I think it may suffice us for experimenting on rabbits or dogs.

At the same time, I think that a heavy moral responsibility rests on those who perform experiments of the second kind.

The wanton infliction of pain on man or beast is a crime; pity is that so many of those who (as I think rightly) hold this view, seem to forget that the criminality lies in the wantonness and not in the act of inflicting pain *per se*.—I am, sir, yours faithfully,

T. H. HUXLEY.

So far back as 1870 a committee had been appointed by the British Association, and reported upon the conditions under which they considered experiments on living animals justifiable. In the early spring of 1875 a bill to regulate physiological research was introduced into the Upper House by Lord Hartismere, but not proceeded with. When legislation seemed imminent Huxley, in concert with other men of science, interested himself in drawing up a petition to Parliament to direct opinion on the subject and provide a fair basis for future legislation, which indeed took shape immediately after in a bill introduced by Dr. Lyon Playfair (afterwards Lord Playfair), Messrs. Walpole and Ashley. This bill, though more just to science, did not satisfy many scientific men, and was withdrawn upon the appointment of a Royal Commission.

The following letters to Mr. Darwin bear on this period:—

4 MARLBOROUGH PLACE, *Jan.* 22, 1875.

MY DEAR DARWIN—I quite agree with your letter about vivisection as a matter of right and justice in the first place, and secondly as the best method of taking the wind out of the enemy's sails. I will communicate with Burdon Sanderson and see what can be done.

My reliance as against — and her fanatical following is not in the wisdom and justice of the House of Commons, but in the large number of fox-hunters therein. If physiological experimentation is put down by law, hunting, fishing and shooting, against which a much better case can be made out, will soon follow.—Ever yours, very faithfully,

T. H. HUXLEY.

SOUTH KENSINGTON, *April* 21, 1875.

MY DEAR DARWIN—The day before yesterday I met Playfair at the club, and he told me that he had heard from Miss Elliott that *I* was getting up what she called a "Vivisector's Bill," and that Lord Cardwell was very anxious to talk with some of us about the matter.

So you see that there is no secret about our proceedings. I gave him a general idea of what was doing, and he quite confirmed what Lubbock said about the impossibility of any action being taken in Parliament this session.

Playfair said he should like very much to know what we proposed doing, and I should think it would be a good thing to take him into consultation.

On my return I found that Pflüger had sent me his memoir with a note such as he had sent to you.

I read it last night, and I am inclined to think that it is a very important piece of work.

He shows that frogs absolutely deprived of oxygen give off carbonic acid for twenty-five hours, and gives very strong reasons for believing that the evolution of carbonic acid by living matter in general is the result of a process of internal rearrangement of the molecules of the living matter, and not of direct oxidation.

His speculations about the origin of living matter are the best I have seen yet, so far as I understand them. But he plunges into the depths of the higher chemistry in which I am by no means at home. Only this I can see, that the paper is worth careful study.—Ever yours faithfully,

T. H. HUXLEY.

31 ROYAL TERRACE, EDINBURGH, *May 19, 1875.*

MY DEAR DARWIN—Playfair has sent a copy of his bill to me, and I am sorry to find that its present wording is such as to render it very unacceptable to all teachers of physiology. In discussing the draft with Litchfield I recollect that I insisted strongly on the necessity of allowing demonstrations to students, but I agreed that it would be sufficient to permit such demonstrations only as could be performed under anæsthetics.

The second clause of the bill, however, by the words "for the purpose of new scientific discovery and for no other purpose," absolutely prohibits any kind of demonstration. It would debar me from showing the circulation in the web of a frog's foot or from exhibiting the pulsations of the heart in a decapitated frog.

And by its secondary effect it would prohibit discovery. Who is to be able to make discoveries unless he knows of his own knowledge what has been already made out? It might as well be ruled that a chemical student should begin with organic analysis.

Surely Burdon Sanderson did not see the draft of the bill as it now stands. The Professors here are up in arms about it, and as the papers have associated my name with the bill I shall have to repudiate it publicly unless something can be done. But what in the world is to be done? I have not written to Playfair yet, and shall wait to hear from you before I go. I have an excellent class here, 340 odd, and like the work. Best regards to Mrs. Darwin.—Ever yours faithfully, T. H. HUXLEY.

31 ROYAL TERRACE, EDINBURGH, *June 5, 1875.*

MY DEAR DARWIN—I see I have forgotten to return Playfair's letter, which I inclose. He sent me a copy of his last letter to you, but it did not reach me till some days after my return from London. In the meanwhile I saw him and Lord Cardwell at the House of Commons on Friday (last week).

Playfair seems rather disgusted at our pronunciamento against the bill, and he declares that both Sanderson and Sharpey assented to it. What they were dreaming about I cannot imagine. To say that no man shall experiment except for purpose of original discovery is about as reasonable as to ordain that no man shall swim unless he means to go from Dover to Calais.

However the Commission is to be issued, and it is everything to gain time and let the present madness subside a little. I vowed I would never be a member of another Commission if I could help it, but I suppose I shall have to serve on this.

I am very busy with my lectures, and am nearly half through. I shall not be sorry when they are over, as I have been grinding away now since last October.—With kindest regards to Mrs. Darwin, ever yours very faithfully,

T. H. HUXLEY.

He was duly asked to serve on the Commission. Though his lectures in Edinburgh prevented him from attending till the end of July no difficulty was made over this, as the first meetings of the Commission, which began on June 30, were to be devoted to taking the less controversial evidence. In accepting his nomination he wrote to Mr. Cross (afterwards Lord Cross), at that time Home Secretary:—

If I can be of any service I shall be very glad to act on the Commission, sympathising as I do on the one hand with those who abhor cruelty to animals, and, on the other, with those who abhor the still greater cruelty to man which is involved in any attempt to arrest the progress of physiology and of rational medicine.

The other members of the Commission were Lords Cardwell and Winmarleigh, Mr. W. E. Forster, Sir J. B. Karslake, Professor Erichssen, and Mr. R. H. Hutton.

The evidence given before the Commission bore out the view that English physiologists inflicted no more pain upon animals than could be avoided; but one witness, not an Englishman, and not having at that time a perfect command of the English language, made statements which appeared to the Commission at least to indicate that the witness was indifferent to animal suffering. Of this incident Huxley writes to Mr. Darwin at the same time as he forwarded a formal invitation for him to appear as a witness before the Commission:—

4 MARLBOROUGH PLACE, *Oct. 30, 1875.*

MY DEAR DARWIN—The inclosed tells its own story. I have done my best to prevent your being bothered, but for various reasons which will occur to you I did not like to appear too obstructive, and I was asked to write to you. The strong feeling of my colleagues (and my own I must say also) is that we ought to have your opinions in our minutes. At the same time there is a no less strong desire to trouble you as little as possible, and under no circumstances to cause you any risk of injury to health.

What with occupation of time, worry and vexation, this horrid Commission is playing the deuce with me. I have felt it my duty to act as counsel for Science, and was well satisfied with the way things were going. But on Thursday when I was absent at the Council of the Royal Society — was examined, and if what I hear is a correct account of the evidence he gave I may as well throw up my brief.

I am told that he openly professed the most entire indifference to animal suffering, and said he only gave anæsthetics to keep animals quiet!

I declare to you I did not believe the man lived who was such an unmitigated cynical brute as to profess and act upon such principles, and I would willingly agree to any law which would send him to the treadmill.

The impression his evidence made on Cardwell and Forster is profound, and I am powerless (even if I had the desire which I have not) to combat it. He has done more mischief than all the fanatics put together.

I am utterly disgusted with the whole business.—Ever yours,  
T. H. HUXLEY.

Of course keep the little article on Species. It is in some American Encyclopædia published by Appleton. And best thanks for your book. I shall study it some day, and value it as I do every line you have written. Don't mention what I have told you outside the circle of discreet Darwindom.

4 MARLBOROUGH PLACE, Nov. 2, 1875.

MY DEAR DARWIN—Our secretary has telegraphed to you to Down, and written to Queen Anne Street.

But to make sure, I send this note to say that we expect you at 13 Delahay Street \* at 2 o'clock to-morrow. And that I have looked out the highest chair that was to be got for you.†—Ever yours very faithfully,  
T. H. HUXLEY.

The Commission reported early in 1876, and a few months after Lord Carnarvon introduced a bill intituled "An Act to amend the law relating to Cruelty to Animals." It was a more drastic measure than was demanded. As a writer in *Nature* (1876, p. 248) puts it: "The evidence on

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\* Where the Commission was sitting.

† Mr. Darwin was long in the leg. When he came to our house the biggest hassock was always placed in an arm-chair to give it the requisite height for him.

the strength of which legislation was recommended went beyond the facts, the report went beyond the evidence, the recommendations beyond the report, and the bill can hardly be said to have gone beyond the recommendations, but rather to have contradicted them."

As to the working of the law Huxley referred to it the following year in the address, already cited, on "Elementary Instruction in Physiology" (*Coll. Essays*, iii. 310).

But while I should object to any experimentation which can justly be called painful, and while as a member of a late Royal Commission I did my best to prevent the infliction of needless pain for any purpose, I think it is my duty to take this opportunity of expressing my regret at a condition of the law which permits a boy to troll for pike or set lines with live frog bait for idle amusement, and at the same time lays the teacher of that boy open to the penalty of fine and imprisonment if he uses the same animal for the purpose of exhibiting one of the most beautiful and instructive of physiological spectacles—the circulation in the web of the foot. No one could undertake to affirm that a frog is not inconvenienced by being wrapped up in a wet rag and having his toes tied out, and it cannot be denied that inconvenience is a sort of pain. But you must not inflict the least pain on a vertebrated animal for scientific purposes (though you may do a good deal in that way for gain or for sport) without due licence of the Secretary of State for the Home Department, granted under the authority of the Vivisection Act.

So it comes about that, in this year of grace 1877, two persons may be charged with cruelty to animals. One has impaled a frog, and suffered the creature to writhe about in that condition for hours; the other has pained the animal no more than one of us would be pained by tying strings round his fingers and keeping him in the position of a hydropathic patient. The first offender says, "I did it because I find fishing very amusing," and the magistrate bids him depart in peace—nay, probably wishes him good sport. The second pleads, "I wanted to impress a scientific truth with a distinctness attainable in no other way on the minds of my scholars," and the magistrate fines him five pounds.

I cannot but think that this is an anomalous and not wholly creditable state of things.



## CHAPTER XXX

1875-1876

HUXLEY only delivered one address outside his regular work in 1875, on "Some Results of the 'Challenger' Expedition," given at the Royal Institution on January 29. For all through the summer he was away from London, engaged upon the summer course of lectures on Natural History at Edinburgh. This was due to the fact that Professor (afterwards Sir) Wyville Thomson was still absent on the *Challenger* expedition, and Professor Victor Carus, who had acted as his substitute before, was no longer available. Under these circumstances the Treasury granted Huxley leave of absence from South Kensington. His course began on May 3, and ended on July 23, and he thought it a considerable feat to deal with the whole Animal Kingdom in 54 lectures. No doubt both he and his students worked at high pressure, especially when the latter came scantily prepared for the task, like the late Joseph Thomson, afterwards distinguished as an African traveller, who has left an account of his experience in this class. Thomson's particular weak point was his Greek, and the terminology of the lectures seems to have been a thorn in his side. This account, which actually tells of the 1876 course, occurs on pp. 36 and 37 of his "Life."

The experience of studying personally under Huxley was a privilege to which he had been looking forward with eager anticipation; for he had already been fascinated with the charm of Huxley's writings, and had received from them no small amount of mental stimulus. Nor were his expectations disap-

pointed. But he found the work to be unexpectedly hard, and very soon he had the sense of panting to keep pace with the demands of the lecturer. It was not merely that the texture of scientific reasoning in the lectures was so closely knit,—although that was a very palpable fact,—but the character of Huxley's terminology was entirely strange to him. It met him on his weakest side, for it presupposed a knowledge of Greek (being little else than Greek compounds with English terminations) and of Greek he had none.

Huxley's usual lectures, he writes, are something awful to listen to. One half of the class, which numbers about four hundred, have given up in despair from sheer inability to follow him. The strain on the attention of each lecture is so great as to be equal to any ordinary day's work. I feel quite exhausted after them. And then to master his language is something dreadful. But, with all these drawbacks, I would not miss them, even if they were ten times as difficult. They are something glorious, sublime!

Again he writes:—

Huxley is still very difficult to follow, and I have been four times in his lectures completely stuck and utterly helpless. But he has given us eight or nine beautiful lectures on the frog. . . . If you only heard a few of the lectures you would be surprised to find that there were so few missing links in the chain of life, from the amoeba to the genus homo.

It was a large class, ultimately reaching 353 and breaking the record of the Edinburgh classes without having recourse to the factitious assistance proposed in the letter of May 16.

His inaugural lecture was delivered under what ought to have been rather trying circumstances. On the way from London he stopped a night with his old friends, John Bruce and his wife (one of the Fannings), at their home, Barmoor Castle, near Beal. He had to leave at 6 next morning, reaching Edinburgh at 10, and lecturing at 2. "Nothing," he writes, "could be much worse, but I am going through it with all the cheerfulness of a Christian martyr."

On May 3 he writes to his wife from the Bruces' Edinburgh house, which they had lent him.

I know that you will be dying to hear how my lecture went off to-day—so I sit down to send you a line, though you did hear from me to-day.

The theatre was crammed. I am told there were 600 auditors, and I could not have wished for more thorough attention. But I had to lecture in gown and Doctor's hood and the heat was awful. The Principal and the chief Professors were present, and altogether it was a state affair. I was in great force, although I did get up at six this morning and travelled all the way from Barmoor. But I won't do that sort of thing again, it's tempting Providence.

May 5.—Fanny and her sisters and the Governess flit to Barmoor to-day and I shall be alone in my glory. I shall be very comfortable and well cared for, so make your mind easy, and if I fall ill I am to send for Clark. He expressly told me to do so as I left him!

I gave my second lecture yesterday to an audience filling the theatre. The reason of this is that everybody who likes—comes for the first week and then only those who have tickets are admitted. How many will become regular students I don't know yet, but there is promise of a big class. The Lord send three extra—to make up for . . . (a sudden claim upon his purse before he left home).

And he writes of this custom to Professor Baynes on June 12:—

My class is over 350 and I find some good working material among them. Parsons mustered strong in the first week, but I fear they came to curse and didn't remain to pay.

He was still Lord Rector of Aberdeen University, and on May 10 writes how he attended a business meeting there:—

I have had my run to Aberdeen and back—got up at 5, started from Edinburgh at 6.25, attended the meeting of the Court at 1. Then drove out with Webster to Edgehill in a great storm of rain and was received with their usual kindness. I did not get back till near 8 o'clock last night and, thanks to *The Virginians* and a good deal of Virginia, I passed the time pleasantly enough. . . . There are 270 tickets gone up to this date, so I suppose I may expect a class of 300 men.  $300 \times 4 = 1200$ . Hooray.

## TO HIS ELDEST DAUGHTER

EDINBURGH, *May* 16, 1875.

MY DEAREST JESS—Your mother's letter received this morning reminds me that I have not written to "Cordelia" (I suppose she means Goneril) by a message from that young person—so here is reparation.

I have 330 students, and my class is the biggest in the University—but I am quite cast down and discontented because it is not 351,—being one more than the Botany Class last year—which was never so big before or since.

I am thinking of paying 21 street boys to come and take the extra tickets so that I may crow over all my colleagues.

Fanny Bruce is going to town next week to her grandmother's and I want you girls to make friends with her. It seems to me that she is very nice—but that is only a fallible man's judgment, and Heaven forbid that I should attempt to forestall Miss Cudberry's decision on such a question. Anyhow she has plenty of energy and, among other things, works very hard at *German*.

M— says that the Rootle-Tootles have a bigger drawing-room than ours. I should be sorry to believe these young beginners guilty of so much presumption, and perhaps you will tell them to have it made smaller before I visit them.

A Scotch gentleman has just been telling me that May is the worst month in the year, here; so pleasant! but the air is soft and warm to-day, and I look out over the foliage to the castle and don't care.

Love to all, and specially M—. Mind you don't tell her that I dine out to-day and to-morrow—positively for the first and last times.—Ever your loving father,

T. H. HUXLEY.

However, the class grew without such adventitious aid, and he writes to Mr. Herbert Spencer on June 15:—

. . . I have a class of 353, and instruct them in dry facts—particularly warning them to keep free of the infidel speculations which are current under the name of evolution.

I expect an "examiner's call" from a Presbytery before the course is over, but I am afraid that the pay is not enough to induce me to forsake my "larger sphere of influence" in London.

In the same letter he speaks of a flying visit to town which he was about to make on the following Thursday, returning on the Saturday for lack of a good Sunday train:

Mayhap I may chance to see you at the club—but I shall be torn to pieces with things to do during my two days' stay.

If Moses had not existed I should have had three days in town, which is a curious concatenation of circumstances.

As for his health during this period, it maintained, on the whole, a satisfactory level, thanks to the regime of which he writes to Professor Baynes:

I am very sorry to hear that you have been so seriously ill. You will have to take to my way of living—a mutton chop a day and no grog, but much baccy. Don't begin to pick up your threads too fast.

No wonder you are uneasy if you have crabs on your conscience.\* Thank Heaven they are not on mine!

I am glad to hear you are getting better, and I sincerely trust that you may find all the good you seek in the baths.

As to coming back a "new man," who knows what that might be? Let us rather hope for the old man in a state of complete repair—At copper bottomed.

Excuse my nautical language.

The following letters also touch on his Edinburgh lectures:—

CRAGSIDE, MORPETH, *August 11, 1875.*

MY DEAR FOSTER—We are staying here with Sir W. Armstrong—the whole brood. Miss Matthaei and the majority of the chickens being camped at a farm-house belonging to our host about three miles off. It is wetter than it need be, otherwise we are very jolly.

I finished off my work in Edinburgh on the 23rd and positively polished off the Animal Kingdom in 54 lectures. French without a master in twelve lessons is nothing to this feat. The men worked very well on the whole, and sent in some creditable examination papers. I stayed a few days to finish up the abstracts of my lectures for the *Medical Times*; then picked up the two elder girls who were at Barmoor and brought them on here to join the wife and the rest.

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\* *i.e.* an article for the *Encyclopædia Britannica*.

How is it that Dohrn has been and gone? I have been meditating a letter to him for an age. He wanted to see me, and I did not know how to manage to bring about a meeting.

Edinburgh is greatly exercised in its mind about the vivisection business, and "Vagus" "swells wisely" whenever the subject is mentioned. I think there is an inclination to regard those who are ready to consent to legislation of any kind as traitors, or, at any rate, trimmers. It sickens me to reflect on the quantity of time and worry I shall have to give to that subject when I get back.

I see that — has been blowing the trumpet at the Medical Association. He has about as much tact as a flyblown bull.

I have just had a long letter from Wyville Thomson. The *Challenger* inclines to think that *Bathybius* is a mineral precipitate! in which case some enemy will probably say that it is a product of my precipitation. So mind, I was the first to make that "goak." Old Ehrenberg suggested something of the kind to me, but I have not his letter here. I shall eat my leek handsomely, if any eating has to be done. They have found pseudopodia in *Globigerina*.

With all good wishes from ours to yours—Ever yours faithfully,  
T. H. HUXLEY.

CRAGSIDE, MORPETH, *August 13, 1875.*

MY DEAR TYNDALL—I find that in the midst of my work in Edinburgh I omitted to write to De Vrij, so I have just sent him a letter expressing my pleasure in being able to co-operate in any plan for doing honour to old Benedict,\* for whom I have a most especial respect.

I am not sure that I won't write something about him to stir up the Philistines.

My work at Edinburgh got itself done very satisfactorily, and I cleared about £1000 by the transaction, being one of the few examples known of a Southern coming north and pillaging the Scots. However, I was not sorry when it was all over, as I had been hard at work since October and began to get tired.

The wife and babies from the south, and I from the north, met here a fortnight ago and we have been idling very pleasantly ever since. The place is very pretty and our host kindness itself. Miss Matthaei and five of the bairns are at Cartington—a moorland farm-house three miles off—and in point of rosy

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\* Spinoza, a memorial to whom was being raised in Holland.

cheeks and appetites might compete with any five children of their age and weight. Jess and Mady are here with us and have been doing great execution at a ball at Newcastle. I really don't know myself when I look at these young women, and my hatred of possible sons-in-law is deadly. All send their love.—Ever yours very faithfully,

T. H. HUXLEY.

Wish you joy of Bristol.

The following letter to Darwin was written when the Polar Expedition under Sir George Nares was in preparation. It illustrates the range of observation which his friends had learned to expect in him :—

ATHENÆUM CLUB, *Jan.* 22, 1875.

MY DEAR DARWIN—I write on behalf of the Polar Committee of the Royal Society to ask for any suggestions you may be inclined to offer us as instructions to the naturalists who are to accompany the new expedition.

The task of drawing up detailed instructions is divided among a lot of us; but you are as full of ideas as an egg is full of meat, and are shrewdly suspected of having, somewhere in your capacious cranium, a store of notions which would be of great value to the naturalists.

All I can say is, that if you have not already “collated facts” on this topic, it will be the first subject I ever suggested to you on which you had not.

Of course we do not expect you to put yourself to any great trouble—nor ask for such a thing—but if you will jot down any notes that occur to you we shall be thankful.

We must have everything in hand for printing by March 15.  
—Ever yours very faithfully,

T. H. HUXLEY.

The following letter dates from soon after the death of Charles Kingsley :—

SCIENCE SCHOOLS, S. KENSINGTON, *Oct.* 22, 1875.

DEAR MISS KINGSLEY—I sincerely trust that you believe I have been abroad and prostrated by illness, and have thereby accounted for receiving no reply to your letter of a fortnight back.

The fact is that it has only just reached me, owing to the neglect of the people in Jermyn Street, who ought to have sent it on here.

I assure you I have not forgotten the brief interview to which you refer, and I have often regretted that the hurry and worry of life (which increases with the square of your distance from youth) never allowed me to take advantage of your kind father's invitation to become better acquainted with him and his. I found his card in Jermyn Street when I returned last year, with a pencilled request that I would call on him at Westminster.

I meant to do so, but the whirl of things delayed me until, as I bitterly regret, it was too late.

I am not sure that I have any important letter of your father's but one, written to me some fifteen years ago, on the occasion of the death of a child who was then my only son. It was in reply to a letter of my own written in a humour of savage grief. Most likely he burned the letter, and his reply would be hardly intelligible without it. Moreover, I am not at all sure that I can lay my hands upon your father's letter in a certain chaos of papers which I have never had the courage to face for years. But if you wish I will try.

I am very grieved to hear of Mrs. Kingsley's indisposition. Pray make my kindest remembrances to her, and believe me yours very faithfully,

T. H. HUXLEY.

*P.S.*—By the way, letters addressed to my private residence,

4 MARLBOROUGH PLACE, N.W.,

are sure not to be delayed. And I have another reason for giving the address—the hope that when you come to Town you will let my wife and daughters make your acquaintance.

His continued interest in the germ-theory and the question of the origin of life (*Address at the British Association, 1870, see p. 355, sq.*), appears from the following:—

4 MARLBOROUGH PLACE, Oct. 15, 1875.

MY DEAR TYNDALL—Will you bring with you to the *x* tomorrow a little bottle full of fluid containing the bacteria you have found developed in your infusions? I mean a good characteristic specimen. It will be useful to you, I think, if I determine the forms with my own microscope, and make drawings of them which you can use.—Ever yours,

T. H. HUXLEY.

I can't tell you how delighted I was with the experiments.



Throughout this period, and for some time later, he was in frequent communication with Thomas Spencer Baynes, Professor of Logic and English Literature at St. Andrews University, the editor of the new *Encyclopædia Britannica*, work upon which was begun at the end of 1873. From the first Huxley was an active helper, both in classifying the biological subjects which ought to be treated of, suggesting the right men to undertake the work, and himself writing several articles, notably that on Evolution.\*

Extracts from his letters to Professor Baynes between the years 1873 and 1884, serve to illustrate the work which he did and the relations he maintained with the genial and learned editor.

*Nov. 2, 1873.*—I have been spending my Sunday morning in drawing up a list of headings, which will I think exhaust biology from the Animal point of view, and each of which does not involve more than you are likely to get from one man. In many cases, *i.e. Insecta, Entomology*, I have subdivided the subjects, because, by an unlucky peculiarity of workers in these subjects, men who understand zoology from its systematic side are often ignorant of anatomy, and those who know fossils are often weak in recent forms.

But of course the subdivision does not imply that one man should not take the whole if he is competent to do so. And if separate contributors supply articles on these several subdivisions, somebody must see that they work in harmony.

But with all the good will in the world, he was too hard pressed to get his quota done as quickly as he wished. He suggests at once that "Hydrozoa" and "Actinozoa," in his list, should be dealt with by the writer of the article "Cœlenterata."

Shunting "Actinozoa" to "Cœlenterata" would do no harm, and would have the great merit of letting me breathe a little. But if you think better that "Actinozoa" should come in its place under A, I will try what I can do.

*December 30, 1873.*—As to *Anthropology*, I really am afraid to promise. At present I am plunged in *Amphibia*, doing a lot

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\* Others were *Actinozoa, Amphibia, Animal Kingdom, and Biology.*

of original work to settle questions which have been hanging vaguely in my mind for years. If *Amphibia* is done by the end of January it is as much as it will be.

In February I must give myself—or at any rate my spare self—up to my Rectorial Address,\* which (tell it not in Gath) I wish at the bottom of the Red Sea. And I do not suppose I shall be able to look seriously at either *Animal Kingdom* or *Anthropology* before the address is done with. And all depends on the centre of my microcosm—intestinum colon—which plays me a trick every now and then.

I will do what I can if you like, but if you trust me it is at your proper peril.

Feb. 8, 1874.—How astonished folks will be if eloquent passages out of the address get among the *Amphibia*, and comments on Frog anatomy into the address. As I am working at both just now this result is not improbable.

Meanwhile the address and the ten days' stay at Aberdeen had been "playing havoc with the *Amphibia*," but on returning home, he went to work upon the latter, and writes on March 12:—

I did not care to answer your last letter until I had an instalment of *Amphibia* ready. Said instalment was sent off to you, care of Messrs. Black, yesterday, and now I feel like Dick Swiveller, when happy circumstances having enabled him to pay off an old score he was able to begin running up another.

June 8.—I have had sundry proofs and returned them. My writing is lamentable when I am in a hurry, but I never provoked a strike before! I declare I think I write as well as the editor, on ordinary occasions.

He was pleased to find someone who wrote as badly as, or worse than, himself, and several times rallies Baynes on that score. Thus, when Mrs. Baynes had acted as her husband's amanuensis, he writes (February 11, 1878):—

My respectful compliments to the "mere machine," whose beautiful caligraphy (if that isn't a tautology) leaves no doubt in my mind that whether the writing of your letters by that agency is good for you or not it is admirable for your correspondents.

Why people can't write a plain legible hand I can't imagine.\*

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\* His Rectorial Address at Aberdeen. (See p. 436.)

† *N.B.*—This sentence is written purposely in a most illegible hand.

And on another occasion he adds a postscript to say, "You write worse than ever. So do I."

However, the article got finished in course of time:—

*Aug. 5.*—I have seen and done with all *Amphibia* but the last sheet, and that only waits revise. Considering it was to be done in May, I think I am pretty punctual.

The next year, immediately before taking Sir Wyville Thomson's lectures at Edinburgh, he writes about another article which he had in hand:—

4 MARLBOROUGH PLACE, N.W., *March 16, 1875.*

MY DEAR BAYNES—I am working against time to get a lot of things done—amongst others BIOLOGY—before I go north. I have written a large part of said article, and it would facilitate my operation immensely if what is done were set up and I had two or three proofs, one for Dyer, who is to do part of the article.

Now, if I send the MS. to North Bridge will you swear by your gods (0—1—3—1 or any greater number as the case may be) that I shall have a proof swiftly and not be kept waiting for weeks till the whole thing has got cold, and I am at something else a hundred miles away from Biology?

If not I will keep the MS. till it is all done, and you know what that means.—Ever yours very truly,

T. H. HUXLEY.

CRAGSIDE, MORPETH, *Aug. 12, 1875.*

MY DEAR BAYNES—The remainder of the proof of "Biology" is posted to-day—"Praise de Lor'."

I have a dim recollection of having been led by your soft and insinuating ways to say that I would think (only *think*) about some other article. What the deuce was it?

I have told the Royal Society people to send you a list of Fellows, addressed to Black's.

We have had here what may be called bad weather for England, but it has been far better than the best Edinburgh weather known to my experience.

All my friends are out committing grouse-murder. As a vivisection Commissioner I did not think I could properly accompany them.—Ever yours very faithfully,

T. H. HUXLEY.

CRAGSIDE, MORPETH, *Aug.* 24, 1875.

MY DEAR BAYNES—I think — is like enough to do the “*Cœlenterata*” well if you can make sure of his doing it at all. He is a man of really great knowledge of the literature of Zoology, and if it had not been for the accident of being a procrastinating impracticable ass, he could have been a distinguished man. But he is a sort of Balaam-Centaur with the asinine stronger than the prophetic moiety.

I should be disposed to try him, nevertheless.

I don't think I have had final revise of Biology yet.

I do not know that “*Cœlenterata*” is Lankester's specialty. However, he is sure to do it well if he takes it up.—Ever yours very faithfully,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., *Oct.* 12, 1875.

MY DEAR BAYNES—Do you remember my telling you that I should before long be publishing a book, of which general considerations on Biology would form a part, and that I should have to go over the same ground as in the article for the *Encyclopædia*?

Well, that prediction is about to be verified, and I want to know what I am to do.

You see, as I am neither dealing with Theology, nor History, nor Criticism, I can't take a fresh departure and say something entirely different from what I have just written.

On the other hand, if I republish what stands in the article, the *Encyclopædia* very naturally grows.

What do the sweetest of Editors and the most liberal of Proprietors say ought to be done under the circumstances?

I pause for a reply.

I have carried about Stanley's\* note in my pocket-book until I am sorry to say the flyleaf has become hideously stained.

The wife and daughters could make nothing of it, but I, accustomed to the MS. of certain correspondents, have no doubt as to the fourth word of the second sentence. It is “*Canterbury*.” † Nothing can be plainer.

Hoping the solution is entirely satisfactory,—Believe me, ever yours very faithfully,

T. H. HUXLEY.

\* The Dean's handwriting was proverbial.

† The writing of this word is carefully slurred until it is almost as illegible as the original.

Though he refused to undertake the article on *Distribution*, he managed to write that on *Evolution* (republished in *Collected Essays*, ii. 187). Thus on July 28, 1877, he writes:—

I ought to do "Evolution," but I mightn't and I shouldn't. Don't see how it is practicable to do justice to it with the time at my disposal, though I really should like to do it, and I am at my wits' end to think of anybody who can be trusted with it.

Perhaps something may turn up, and if so I will let you know.

The something in the way of more time did turn up by dint of extra pressure, and the article got written in the course of the autumn, as appears from the following of December 29, 1877:—

I send you the promised skeleton (with a good deal of the flesh) of *Evolution*. It is costing me infinite labour in the way of reading, but I am glad to be obliged to do the work, which will be a curious and instructive chapter in the history of Science.

The lawyer-like faculty of putting aside a subject when done with, which is indicated in the letter of March 16, 1875, reappears in the following:—

4 MARLBOROUGH PLACE, N.W., *March 18, 1878.*

MY DEAR BAYNES—Your printers are the worst species of that diabolic genus I know of. It is at least a month since I sent them a revise of "Evolution" by no means finished, and from that time to this I have had nothing from them.

I shall forget all about the subject, and then at the last moment they will send me a revise in a great hurry, and expect it back by return of post.

But if they get it, may I go to their Father!—Ever yours  
T. H. HUXLEY.

Later on, the pressure of work again forbade him to undertake further articles on *Harvey*, *Hunter*, and *Instinct*.

I am sorry to say that my hands are full, and I have sworn by as many gods as Hume has left me, to undertake nothing more for a long while beyond what I am already pledged to do, a small book anent Harvey being one of these things.

And on June 9:—

After nine days' meditation (directed exclusively to the Harvey and Hunter question) I am not any "forrarder," as the farmer said after his third bottle of Gladstone claret. So perhaps I had better mention the fact. I am very glad you have limed Flower for "Mammalia" and "Horse"—nobody could be better.

4 MARLBOROUGH PLACE, N.W., *July 1, 1879.*

MY DEAR BAYNES—On Thursday last I sought for you at the Athenæum in the middle of the day, and told them to let me know if you came in in the evening when I was there again. But I doubt not you were plunged in dissipation.

My demonstrator Parker showed me to-day a letter he had received from Black's, asking him to do anything in the small Zoology way between H and L.

He is a modest man, and so didn't ask what the H—L he was to do, but he looked it.

Will you enlighten him or me, and I will convey the information on?

I had another daughter married yesterday. She was a great pet and it is very hard lines on father and mother. The only consolation is that she has married a right good fellow, John Collier the artist.—Ever yours very faithfully,

T. H. HUXLEY.

*July 19, 1879.*—Many thanks for your and Mrs. Baynes' congratulations. I am very well content with my son-in-law, and have almost forgiven him for carrying off one of my pets, which shows a Christian spirit hardly to be expected of me.

SOUTH KENSINGTON, *July 2, 1880.*

MY DEAR BAYNES—I have been thinking over the matter of Instinct, and have come to the conclusion that I dare not undertake anything fresh.

There is an address at Birmingham in the autumn looming large, and ghosts of unfinished work flitter threateningly.—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER XXXI

1876

THE year 1876 was again a busy one, almost as busy as any that went before. As in 1875, his London work was cut in two by a course of lectures in Edinburgh, and sittings of the Royal Commission on Scottish Universities, and furthermore, by a trip to America in his summer vacation.

In the winter and early spring he gave his usual lectures at South Kensington; a course to working men "On the Evidence as to the Origin of Existing Vertebrated Animals," from February to April (*Nature*, vols. xiii. and xiv.); a lecture at the Royal Institution (January 28) "On the Border Territory between the Animal and Vegetable Kingdoms" (*Coll. Essays*, viii. 170); and another at Glasgow (February 15) "On the Teleology and Morphology of the Hand."

In this lecture, which he never found time to get into final shape for publication, but which was substantially repeated at the Working Men's College in 1878, he touched upon one of the philosophic aspects of the theory of evolution, namely, how far is it consistent with the argument from design?

Granting provisionally the force of Paley's argument in individual cases of adaptation, and illustrating it by the hand and its representative in various of the Mammalia, he proceeds to show by the facts of morphology that the argument, as commonly stated, fails; that each mechanism, each animal, was not specially made to suit the particular purpose we find it serving, but was developed from a single common type. Yet in a limited and special sense he finds teleology to be not inconsistent with morphology. The

two sets of facts flow from a common cause, evolution. Descent by modification accounts for similarity of structure; the process of gradual adaptation to conditions accounts for the existing adaptation to purpose. To be a teleologist and yet accept evolution it is only necessary "to suppose that the original plan was sketched out—that the purpose was foreshadowed in the molecular arrangements out of which the animals have come."

This was no new view of his. While, ever since his first review of the *Origin* in 1859 (*Coll. Ess.* ii. 6), he had declared the commoner and coarser forms of teleology to find their most formidable opponent in the theory of evolution, and in 1869, addressing the Geological Society, had spoken of "those final causes, have been named barren virgins, but which might be more fitly termed the *hetairæ* of philosophy, so constantly have they led men astray" (*ib.* viii. 80; cp. ii. 21, 36), he had, in his *Criticism of the Origin* (1864, ii. 86), and the *Genealogy of Animals* (1869, ii. 109, *sqq.*), shown "how perhaps the most remarkable service to the philosophy of Biology rendered by Mr. Darwin is the reconciliation of teleology and morphology, and the explanation of the facts of both which his views offer . . . the wider teleology, which is actually based upon the fundamental proposition of evolution."

His note-book shows that he was busy with Reptilia from Elgin and from India; and with his *Manual of Invertebrate Anatomy*, which was published the next year; while he refused to undertake a course of ten lectures at the Royal Institution, saying that he had already too much other work to do, and would have no time for original work.

About this time, also, in answer to a request from a believer in miracles, "that those who fail to perceive the cogency of the evidence by which the occurrence of miracles is supported, should not confine themselves to the discussion of general principles, but should grapple with some particular case of an alleged miracle," he read before the Metaphysical Society a paper dealing with the evidence for the miracle of the resurrection. (See p. 342.)



Some friends wished him to publish the paper as a contribution to criticism; but his own doubts as to the opportunity of so doing were confirmed by a letter from Mr. John Morley, then editor of the *Fortnightly Review*, to which he replied (January 18):—

To say truth, most of the considerations you put so forcibly had passed through my mind—but one always suspects oneself of cowardice when one's own interests may be affected.

At the beginning of May he went to Edinburgh. He writes home on May 8:—

I am in hopes of being left to myself this time, as nobody has called but Sir Alexander Grant the Principal, Crum Brown, whom I met in the street just now, and Lister, who has a patient in the house. I have been getting through an enormous quantity of reading, some tough monographs that I brought with me, the first volume of Forster's *Life of Swift*, *Goodsir's Life*, and a couple of novels of George Sand, with a trifle of Paul Heyse. You should read George Sand's *Césarine Dietrich* and *La Mare au Diable* that I have just finished. She is bigger than George Eliot, more flexible, a more thorough artist. It is a queer thing, by the way, that I have never read *Consuelo*. I shall get it here. When I come back from my lecture I like to rest for an hour or two over a good story. It freshens me wonderfully.

However, social Edinburgh did not leave him long to himself, but though he might thus lose something of working time, this loss was counterbalanced by the dispelling of some of the fits of depression which still assailed him from time to time.

On May 25 he writes:—

The General Assembly is sitting now, and I thought I would look in. It was very crowded and I had to stand, so I was soon spied out and invited to sit beside the Lord High Commissioner, who represents the Crown in the Assembly, and there I heard an ecclesiastical row about whether a certain church should be allowed to have a cover with IHS on the Communion Table or not. After three hours' discussion the IHSers were beaten. I was introduced to the Commissioner Lord Galloway, and asked to dine to-night. So I felt bound to go to the special levee at Holyrood with my colleagues this morning, and I shall have to go to my Lady Galloway's reception in honour of the Queen's

birthday to-morrow. Luckily there will be no more of it. Vanity of Vanities! Saturday afternoon I go out to Lord Young's place to spend Sunday. I have been in rather a hypochondriacal state of mind, and I will see if this course of medicine will drive the seven devils out.

One of the chief friendships which sprang from this residence in Edinburgh was that with Dr. (afterwards Sir John) Skelton, widely known under his literary pseudonym of "Shirley." A civil servant as well as a man of letters, he united practical life with literature, a combination that appealed particularly to Huxley, so that he was a constant visitor at Dr. Skelton's picturesque house, the Hermitage of Braid, near Edinburgh. A number of letters addressed to Skelton from 1875 to 1891 show that with him Huxley felt the stimulus of an appreciative correspondent.

4 MELVILLE STREET, EDINBURGH, *June 23, 1876.*

MY DEAR SKELTON—I do not understand how it is that your note has been so long in reaching me; but I hasten to repel the libellous insinuation that I have vowed a vow against dining at the Hermitage.

I wish I could support that repudiation by at once accepting your invitation for Saturday or Sunday, but my Saturdays and Sundays are mortgaged to one or other of your judges (good judges, obviously).

Shall you be at home on Monday or Tuesday? If so, I would put on a kilt (to be as little dressed as possible), and find my way out and back; happily improving my mind on the journey with the tracts you mention.—Ever yours very faithfully,

T. H. HUXLEY.

4 MELVILLE STREET, EDINBURGH, *July 1, 1876.*

MY DEAR SKELTON—Very many thanks for the copy of the *Comedy of the Noctes*, which reached me two or three days ago. Turning over the pages I came upon the Shepherd's "Terrible Journey of Timbuctoo," which I enjoyed as much as when I first read it thirty odd years ago.—Ever yours very faithfully,

T. H. HUXLEY.

On June 23 he writes home:—

Did you read Gilman's note asking me to give the inaugural discourse at the Johns Hopkins University, and offering £100 on

the part of the trustees? I am minded to do it on our way back from the south, but don't much like taking money for the performance. Tell me what you think about this at once, as I must reply.

This visit to America had been under discussion for some time. It is mentioned as a possibility in a letter to Darwin two years before. Early in 1876 Mr. Frederic Harrison was commissioned by an American correspondent—who, by the way, had named his son Thomas Huxley—to give my father the following message:—"The whole nation is electrified by the announcement that Professor Huxley is to visit us next fall. We will make infinitely more of him than we did of the Prince of Wales and his retinue of lords and dukes." Certainly the people of the States gave him an enthusiastic welcome; his writings had made him known far and wide; as the manager of the Californian department at the Philadelphia Exhibition told him, the very miners of California read his books over their camp fires; and his visit was so far like a royal progress, that unless he entered a city disguised under the name of Jones or Smith, he was liable not merely to be interviewed, but to be called upon to "address a few words" to the citizens.

Leaving their family under the hospitable care of Sir W. and Lady Armstrong at Cragside, my father and mother started on July 27 on board the *Germanic*, reaching New York on August 5. My father sometimes would refer, half jestingly, to the trip as his second honeymoon, when, for the first time in twenty years, he and my mother set forth by themselves, free from all family cares. And indeed, there was the underlying resemblance that this too came at the end of a period of struggle to attain, and marked the beginning of a more settled period. His reception in America may be said to emphasise his definite establishment in the first rank of English thinkers. It was a signal testimony to the wide extent of his influence, hardly suspected, indeed, by himself; an influence due above all to the fact that he did not allow his studies to stand apart from the moving problems of existence, but brought the new and regenerating ideas into contact with life at every point, and that his

championship of the new doctrines had at the same time been a championship of freedom and sincerity in thought and word against shams and self-deceptions of every kind. It was not so much the preacher of new doctrines who was welcomed, as the apostle of veracity—not so much the student of science as the teacher of men.

Moreover, another sentiment coloured this holiday visit. He was to see again the beloved sister of his boyhood. She had always prophesied his success, and now after thirty years her prophecy was fulfilled by his coming, and, indeed, exceeded by the manner of it.

Mr. Smalley, then London correspondent of the *New York Tribune*, was a fellow passenger of his on board the *Germanic*, and tells an interesting anecdote of him:—

Mr. Huxley stood on the deck of the *Germanic* as she steamed up the harbour of New York, and he enjoyed to the full that marvellous panorama. At all times he was on intimate terms with Nature and also with the joint work of Nature and Man; Man's Place in Nature being to him interesting from more points of view than one. As we drew near the city—this was in 1876, you will remember—he asked what were the tall tower and tall building with a cupola, then the two most conspicuous objects. I told him the Tribune and the Western Union Telegraph buildings. “Ah,” he said, “that is interesting; that is American. In the Old World the first things you see as you approach a great city are steeples; here you see, first, centres of intelligence.” Next to those the tug-boats seemed to attract him as they tore fiercely up and down and across the bay. He looked long at them and finally said, “If I were not a man I think I should like to be a tug.” They seemed to him the condensation and complete expression of the energy and force in which he delighted.

The personal welcome he received from the friends he visited was of the warmest. On the arrival of the *Germanic* the travellers were met by Mr. Appleton the publisher, and carried off to his country house at Riverdale. While his wife was taken to Saratoga to see what an American summer resort was like, he himself went on the 9th to New Haven, to inspect the fossils at Yale College, collected from the Tertiary deposits of the Far West by Professor Marsh, with

great labour and sometimes at the risk of his scalp. Professor Marsh told me how he took him to the University, and proposed to begin by showing him over the buildings. He refused. "Show me what you have got inside them; I can see plenty of bricks and mortar in my own country." So they went straight to the fossils, and as Professor Marsh writes:—\*

One of Huxley's lectures in New York was to be on the genealogy of the horse, a subject which he had already written about, based entirely upon European specimens. My own explorations had led me to conclusions quite different from his, and my specimens seemed to me to prove conclusively that the horse originated in the New World and not in the Old, and that its genealogy must be worked out here. With some hesitation, I laid the whole matter frankly before Huxley, and he spent nearly two days going over my specimens with me, and testing each point I made.

At each inquiry, whether he had a specimen to illustrate such and such a point or exemplify a transition from earlier and less specialised forms to later and more specialised ones, Professor Marsh would simply turn to his assistant and bid him fetch box number so and so, until Huxley turned upon him and said, "I believe you are a magician; whatever I want, you just conjure it up."

The upshot of this examination was that he recast a great part of what he meant to say at New York. When he had seen the specimens, and thoroughly weighed their import, continues Professor Marsh—

He then informed me that all this was new to him, and that my facts demonstrated the evolution of the horse beyond question, and for the first time indicated the direct line of descent of an existing animal. With the generosity of true greatness, he gave up his own opinions in the face of new truth, and took my conclusions as the basis of his famous New York lecture on the horse. He urged me to prepare without delay a volume on the genealogy of the horse, based upon the specimens I had shown him. This I promised, but other work and new duties have thus far prevented.

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\* *American Journal of Science*, vol. 1. August 1895.

A letter to his wife describes his visit to Yale:—

My excellent host met me at the station, and seems as if he could not make enough of me. I am installed in apartments which were occupied by his uncle, the millionaire Peabody, and am as quiet as if I were in my own house. We have had a preliminary canter over the fossils, and I have seen some things which were worth all the journey across.

This is the most charmingly picturesque town, with the streets lined by avenues of elm trees which meet overhead. I have never seen anything like it, and you must come and look at it. There is fossil work enough to occupy me till the end of the week, and I have arranged to go to Springfield on Monday to examine the famous footprints of the Connecticut Valley.

The Governor has called upon me, and I shall have to go and do pretty-behaved *chez lui* to-morrow. An application has come for an autograph, but I have not been interviewed!

This immunity, however, did not last long. He appears to have been caught by the interviewer the next day, for he writes on the 11th:—

I have not seen the notice in the *World* you speak of. You will be amused at the article written by the interviewer. He was evidently surprised to meet with so little of the "highfalutin" philosopher in me, and says I am "affable" and of "the commercial or mercantile" type. That is something I did not know, and I am rather proud of it. We may be rich yet.

As to his work at Yale Museum, he writes in the same letter:—

We are hard at work still. Breakfast at 8.30—go over to the Museum with Marsh at 9 or 10—work till 1.30—dine—go back to Museum to work till 6. Then Marsh takes me for a drive to see the views about the town, and back to tea about half-past eight. He is a wonderfully good fellow, full of fun and stories about his Western adventures, and the collection of fossils is the most wonderful thing I ever saw. I wish I could spare three weeks instead of one to study it.

To-morrow evening we are to have a dinner by way of winding up, and he has asked a lot of notables to meet me. I assure you I am being "made of," as I thought nobody but the little wife was foolish enough to do.

On the 16th he left to join the "Alexander Agassiz" at Newport, whence he wrote the following letters:—

NEWPORT, *Aug. 17, 1876.*

MY DEAR MARSH—I really cannot say how much I enjoyed my visit to New Haven. My recollections are sorting themselves out by degrees and I find how rich my store is. The more I think of it the more clear it is that your great work is the settlement of the pedigree of the horse.

My wife joins with me in kind regards. I am yours very faithfully,  
T. H. HUXLEY.

TO MR. CLARENCE KING

NEWPORT, *Aug. 19, 1876.*

MY DEAR SIR—In accordance with your wish, I very willingly put into writing the substance of the opinion as to the importance of Professor Marsh's collection of fossils which I expressed to you yesterday. As you are aware, I devoted four or five days to the examination of this collection, and was enabled by Prof. Marsh's kindness to obtain a fair conception of the whole.

I am disposed to think that whether we regard the abundance of material, the number of complete skeletons of the various species, or the extent of geological time covered by the collection, which I had the good fortune to see at New Haven, there is no collection of fossil vertebrates in existence, which can be compared with it. I say this without forgetting Montmartre, Siwalik, or Pikermi—and I think that I am quite safe in adding that no collection which has been hitherto formed approaches that made by Professor Marsh, in the completeness of the chain of evidence by which certain existing mammals are connected with their older tertiary ancestry.

It is of the highest importance to the progress of Biological Science that the publication of this evidence, accompanied by illustrations of such fulness as to enable palæontologists to form their own judgment as to its value, should take place without delay.—I am yours very faithfully,

THOMAS H. HUXLEY.

Breaking their journey at Boston, they went from Newport to Petersham, in the highlands of Worcester County, where they were the guests of Mr. and Mrs. John

Fiske, at their summer home. Among the other visitors were the eminent musical composer Mr. Paine, the poet Cranch, and daughters of Hawthorne and Longfellow, so that they found themselves in the midst of a particularly cheerful and delightful party. From Petersham they proceeded to Buffalo, the meeting-place that year of the American Association for the Advancement of Science, which my father had promised to attend. Here they stayed with Mr. Marshall, a leading lawyer, who afterwards visited them in England.

A week was spent at Niagara, partly in making holiday, partly in shaping the lectures which had to be delivered at the end of the trip. As to the impression made upon him by the Falls—an experience which, it is generally presumed, every traveller is bound to record—I may note that after the first disappointment at their appearance, inevitable wherever the height of a waterfall is less than the breadth, he found in them an inexhaustible charm and fascination. As in duty bound, he, with my mother, completed his experiences by going under the wall of waters to the “Cave of the Winds.” But of all things nothing pleased him more than to sit of an evening by the edge of the river, and through the roar of the cataract to listen for the under-sound of the beaten stones grinding together at its foot.

Leaving Niagara on September 2, they travelled to Cincinnati, a 20-hours' journey, where they rested a day; on the 4th another 10 hours took them to Nashville, where they were to meet his sister, Mrs. Scott. Though 11 years his senior, she maintained her vigour and brightness undimmed, as indeed she did to the end of her life, surviving him by a few weeks. As she now stood on the platform at Nashville, Mrs. Huxley, who had never seen her, picked her out from among all the people by her piercing black eyes, so like those of her mother as described in the Autobiographical sketch (*Coll. Ess.* i.).

Nashville, her son's home, had been chosen as the meeting-place by Mrs. Scott, because it was not so far south nor so hot as Montgomery, where she was then living. Nevertheless in Tennessee the heat of the American summer was



very trying, and the good people of the town further drew upon the too limited opportunities of their guest's brief visit by sending a formal deputation to beg that he would either deliver an address, or be entertained at a public dinner, or "state his views"—to an interviewer I suppose. He could not well refuse one of the alternatives; and the greater part of one day was spent in preparing a short address on the geology of Tennessee, which was delivered on the evening of September 7. He spoke for twenty minutes, but had scarcely any voice, which was not to be wondered at, as he was so tired that he had kept his room the whole day, while his wife received the endless string of callers.

The next day they returned to Cincinnati; and on the 9th went on to Baltimore, where they stayed with Mr. Garrett, then President of the Baltimore and Ohio railway.

The Johns Hopkins University at Baltimore, for which he was to deliver the opening address, had been instituted by its founder on a novel basis. It was devoted to post-graduate study; the professors and lecturers received incomes entirely independent of the pupils they taught. Men came to study for the sake of learning, not for the sake of passing some future examination. The endowment was devoted in the first place to the furtherance of research; the erection of buildings was put into the background. "It has been my fate," commented Huxley, "to see great educational funds fossilise into mere bricks and mortar in the petrifying springs of architecture, with nothing left to work them. A great warrior is said to have made a desert and called it peace. Trustees have sometimes made a palace and called it a university."

Half the fortune of the founder had gone to this university; the other half to the foundation of a great and splendidly equipped hospital for Baltimore. This was the reason why the discussion of medical training occupies fully half of the address upon the general principles of education, in which, indeed, lies the heart of his message to America, a message already delivered to the old country, but specially appropriate for the new nation developing so rapidly in size and physical resources.

I cannot say that I am in the slightest degree impressed by your bigness or your material resources, as such. Size is not grandeur, territory does not make a nation. The great issue, about which hangs a true sublimity, and the terror of overhanging fate, is, what are you going to do with all these things? . . .

The one condition of success, your sole safeguard, is the moral worth and intellectual clearness of the individual citizen. Education cannot give these, but it can cherish them and bring them to the front in whatever station of society they are to be found, and the universities ought to be and may be, the fortresses of the higher life of the nation.

This address was delivered under circumstances of peculiar difficulty. The day before, an expedition had been made to Washington, from which Huxley returned very tired, only to be told that he was to attend a formal dinner and reception the same evening. "I don't know how I shall stand it," he remarked. Going to his room, he snatched an hour or two of rest, but was then called upon to finish his address before going out. It seems that it had to be ready for simultaneous publication in the New York papers. Now the lecture was not written out; it was to be given from notes only. So he had to deliver it *in extenso* to the reporter, who took it down in shorthand, promising to let him have a longhand copy in good time the next morning. It did not come till the last moment. Glancing at it on his way to the lecture theatre, he discovered to his horror that it was written upon "flimsy" from which he would not be able to read it with any success. He wisely gave up the attempt, and made up his mind to deliver the lecture as best he could from memory. The lecture as delivered was very nearly the same as that which he had dictated the night before, but with some curious discrepancies between the two accounts, which, he used to say, occurring as they did in versions both purporting to have been taken down from his lips, might well lead the ingenious critic of the future to pronounce them both spurious, and to declare that the pretended original was never delivered under the circumstances alleged.\*

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\* Cp. the incident at Belfast, p. 444.

There was an audience of some 2,000, and I am told that when he began to speak of the time that would come when they too would experience the dangers of over-population and poverty in their midst, and would then understand what Europe had to contend with more fully than they did, a pin could have been heard to drop. At the end of the lecture, amid the enthusiastic applause of the crowd, he made his way to the front of the box where his hosts and their party were, and received their warm congratulations. But he missed one voice amongst them, and turning to where his wife sat in silent triumph almost beyond speech, he said, "And have you no word for me?" then, himself also deeply moved, stooped down and kissed her.

This address was delivered on Tuesday, September 12. On the 14th he went to Philadelphia, and on the 15th to New York, where he delivered his three lectures on Evolution on Monday, Wednesday, and Friday, September 18, 20, and 22.

These lectures are very good examples of the skill with which he could present a complicated subject in a simple form, the subject seeming to unroll itself by the force of its own naked logic, and carrying conviction the further through the simplicity of its presentation. Indeed, an unfriendly critic once paid him an unintended compliment, when trying to make out that he was no great speaker; that all he did was to set some interesting theory unadorned before his audience, when such success as he attained was due to the compelling nature of the subject itself.

Since his earlier lectures to the public on evolution, the paleontological evidences had been accumulating; the case could be stated without some of the reservations of former days; and he brings forward two telling instances in considerable detail, the one showing how the gulf between two such apparently distinct groups as Birds and Reptiles is bridged over by ancient fossils intermediate in form; the other illustrating from Professor Marsh's new collections the lineal descent of the specialised Horse from the more general type of quadruped.

The farthest back of these was a creature with four toes

on the front limb and three on the hind limb. Judging from the completeness of the series or forms so far, he ventured to indulge in a prophecy.

Thus, thanks to these important researches, it has become evident that, so far as our present knowledge extends, the history of the horse-type is exactly and precisely that which could have been predicted from a knowledge of the principles of evolution. And the knowledge we now possess justifies us completely in the anticipation that when the still lower Eocene deposits, and those which belong to the Cretaceous epoch, have yielded up their remains of ancestral equine animals, we shall find, first, a form with four complete toes and a rudiment of the innermost or first digit in front, with, probably, a rudiment of the fifth digit in the hind foot; while, in still older forms, the series of the digits will be more and more complete, until we come to the five-toed animals, in which, if the doctrine of evolution is well founded, the whole series must have taken its origin.

Seldom has prophecy been sooner fulfilled. Within two months, Professor Marsh had discovered a new genus of equine mammals, *Eohippus*, from the lowest Eocene deposits of the West, which corresponds very nearly to the description given above.

He continues:—

That is what I mean by demonstrative evidence of evolution. An inductive hypothesis is said to be demonstrated when the facts are shown to be in entire accord with it. If that is not scientific proof, there are no merely inductive conclusions which can be said to be proved. And the doctrine of evolution, at the present time, rests upon exactly as secure a foundation as the Copernican theory of the motions of the heavenly bodies did at the time of its promulgation. Its logical basis is of precisely the same character—the coincidence of the observed facts with theoretical requirements.

He left New York on September 23. "I had a very pleasant trip in Yankee-land," he writes to Professor Baynes, "and did *not* give utterance to a good deal that I am reported to have said there." He reached England in good time for the beginning of his autumn lectures, and his

ordinary busy life absorbed him again. He did not fail to give his London audiences the results of the recent discoveries in American paleontology, and on December 4 delivered a lecture at the London Institution, "On Recent Additions to the Knowledge of the Pedigree of the Horse." In connection with this he writes to Professor Marsh:—

4 MARLBOROUGH PLACE, LONDON, N.W.,  
Dec. 27, 1876.

MY DEAR MARSH—I hope you do not think it remiss of me that I have not written to you since my return, but you will understand that I plunged into a coil of work, and will forgive me. But I do not mean to let the year slip away without sending you all our good wishes for its successor—which I hope will not vanish without seeing you among us.

I blew your trumpet the other day at the London Institution in a lecture about the Horse question. I did not know then that you had got another step back as I see you have by the note to my last lecture, which Youmans has just sent me.

I must thank you very heartily for the pains you have taken over the woodcuts of the lectures. It is a great improvement to have the patterns of the grinders.

I have promised to give a lecture at the Royal Institution on the 21st January next, and I am thinking of discoursing on the Birds with teeth. Have you anything new to tell on that subject? I have implicit faith in the inexhaustibility of the contents of those boxes.

Our voyage home was not so successful as that out. The weather was cold and I got a chill which laid me up for several days, in fact I was not well for some weeks after my return. But I am vigorous again now.

Pray remember me kindly to all New Haven friends. My wife joins with me in kindest regards and good wishes for the new year. "Tell him we expect to see him next year."—I am,  
yours very faithfully,  
T. H. HUXLEY.

On December 16 he delivered a lecture "On the Study of Biology," in connection with the Loan Collection of Scientific Apparatus at South Kensington (*Coll. Essays*, iii. 262), dealing with the origin of the name Biology, its relation to Sociology—"we have allowed that province of Biology to become autonomous; but I should like you to

recollect that this is a sacrifice, and that you should not be surprised if it occasionally happens that you see a biologist apparently trespassing in the region of philosophy or politics; or meddling with human education; because, after all, that is a part of his kingdom which he has only voluntarily forsaken"—how to learn biology, the use of Museums, and above all, the utility of biology, as helping to give right ideas in this world, which "is after all, absolutely governed by ideas, and very often by the wildest and most hypothetical ideas."

This lecture on Biology was first published among the *American Addresses* in 1877.

It was about this time that an extremely Broad Church divine was endeavouring to obtain the signatures of men of science to a document he had drawn up protesting against certain orthodox doctrines. Huxley, however, refused to sign the protest, and wrote the following letter of explanation, a copy of which he sent to Mr. Darwin.

Nov. 18, 1876.

DEAR SIR—I have read the "Protest," with a copy of which you have favoured me, and as you wish that I should do so, I will trouble you with a brief statement of my reasons for my inability to sign it.

I object to clause 2 on the ground long since taken by Hume that the order of the universe such as we observe it to be, furnishes us with the only data upon which we can base any conclusion as to the character of the originator thereof.

As a matter of fact, men sin, and the consequences of their sins affect endless generations of their progeny. Men are tempted, men are punished for the sins of others without merit or demerit of their own; and they are tormented for their evil deeds as long as their consciousness lasts.

The theological doctrines to which you refer, therefore, are simply extensions of generalisations as well based as any in physical science. Very likely they are illegitimate extensions of these generalisations, but that does not make them wrong in principle.

And I should consider it waste of time to "protest" against that which is.

As regards No. 3 I find that as a matter of experience, erroneous beliefs are punished, and right beliefs are rewarded—though very often the erroneous belief is based upon a more conscientious study of the facts than the right belief. I do not see why this should not be as true of theological beliefs as any others. And as I said before, I do not care to protest against that which is.

Many thanks for your congratulations. My tour was very pleasant and taught me a good deal.—I am yours very faithfully,  
T. H. HUXLEY.

P.S.—You are at liberty to make what use you please of this letter.

4 MARLBOROUGH PLACE, Nov. 19, 1876.

MY DEAR DARWIN—I confess I have less sympathy with the half-and-half sentimental school which he represents than I have with thoroughgoing orthodoxy.

If we are to assume that anybody has designedly set this wonderful universe going, it is perfectly clear to me that he is no more entirely benevolent and just in any intelligible sense of the words, than that he is malevolent and unjust. Infinite benevolence need not have invented pain and sorrow at all—infinite malevolence would very easily have deprived us of the large measure of content and happiness that falls to our lot. After all, Butler's "Analogy" is unassailable, and there is nothing in theological dogmas more contradictory to our moral sense, than is to be found in the facts of nature. From which, however, the Bishop's conclusion that the dogmas are true doesn't follow.—With best remembrances to Mrs. Darwin, ever yours very faithfully,  
T. H. HUXLEY.

This incident suggests the story of a retort he once made upon what he considered an unseasonable protest in church, a story which exemplifies, by the way, his strong sense of the decencies of life, appearing elsewhere in his constant respect for the ordinary conventions and his dislike for mere Bohemianism as such.

Once in a country house he was sitting at dinner next to his hostess, a lady who, as will sometimes happen, liked to play the part of Lady Arbitress of the whole neighbourhood. She told him how much she disapproved of the Athanasian Creed, and described how she had risen and left

the village church when the parson began to read it; and thinking to gain my father's assent, she turned to him and said graciously, "Now, Mr. Huxley, don't you think I was quite right to mark my disapproval?"

"My dear Lady ——" he replied, "I should as soon think of rising and leaving your table because I disapproved of one of the entrées."



## CHAPTER XXXII

1877

IN this year he delivered lectures and addresses on the Geological History of Birds, at the Zoological Society's Gardens, June 7; on "Starfishes and their Allies," at the Royal Institution, March 7; at the London Institution, Dec. 17, on Belemnites (a subject on which he had written in 1864, and which was doubtless suggested anew by his autumn holiday at Whitby, where the Lias cliffs are full of these fossils); at the Anthropological Conference, May 22, on Elementary Instruction in Physiology (*Coll. Ess.* iii. 294), with special reference to the recent legislation as to experiments on living animals; and on Technical Education to the Working Men's Club and Institute, December 1 (*Coll. Ess.* iii. 404): a perilous subject, indeed, considering, as he remarks, that "any candid observer of the phenomena of modern society will readily admit that bores must be classed among the enemies of the human race; and a little consideration will probably lead him to the further admission, that no species of that extensive genus of noxious creatures is more objectionable than the educational bore. . . . In the course of the last ten years, to go back no farther, I am afraid to say how often I have ventured to speak of education; indeed, the only part of this wide region into which, as yet, I have not adventured, is that into which I propose to intrude to-day."

The choice of subject for this address was connected with a larger campaign for the establishment of technical education on a proper footing, which began with his work on the School Board, or was this year brought prominently

before the public by another address delivered at the Society of Arts. The Clothworkers Company had already been assisting the Society of Arts in their efforts for the spread of technical education; and in July 1877 a special committee of the Guilds applied to him, amongst half a dozen others, to furnish them with a report as to the objects and methods of a scheme of technical education. This paper fills sixteen pages in the Report of the Livery Companies' Committee for 1878. The fundamental principles on which he bases his practical recommendations are contained in the following paragraph:—

It appears to me that if every person who is engaged in an industry had access to instruction in the scientific principles on which that industry is based; in the mode of applying these principles to practice; in the actual use of the means and appliances employed; in the language of the people who know as much about the matter as we do ourselves; and lastly, in the art of keeping accounts, Technical Education would have done all that can be required of it.

And his suggestion about buildings was at once adopted by the Committee, namely, that they should be erected at a future date, regard being had primarily rather to what is wanted in the inside than what will look well from the outside.

Now the Guilds formed a very proper body to set such a scheme on foot, because only such wealthy and influential members of the first mercantile city in the world could afford to let themselves be despised and jeered at for professing to teach English manufacturers and English merchants that they needed to be taught; and to spend £25,000 a year towards that end for some time without apparent result.

That they eventually succeeded, is due no little to the careful plans drawn out by Huxley. He may be described as "really the engineer of the City and Guilds Institute; for without his advice," declared one of the leading members, "we should not have known what to have done."

At the same time he warned them against indiscriminate zeal; "though under-instruction is a bad thing, it is not

impossible that over-instruction may be worse." The aim of the Livery Companies should specially be to aid the *practical* teaching of science, so that at bottom the question turns mainly on the supply of teachers.

On December 11, 1879, he found a further opportunity of urging the cause of Technical Education. A lecture on Apprenticeships was delivered before the Society of Arts by Professor Silvanus Thompson. Speaking after the lecture (see report in *Nature*, 1879, p. 139) he discussed the necessity of supplying the place of the old apprenticeships by educating children in the principles of their particular crafts, beyond the time when they were forced to enter the workshops. This could be done by establishing schools in each centre of industry, connected with a central institution, such as was to be found in Paris or Zurich. As for complaints of deficient teaching of handicrafts in the Board Schools, it was more important for them to make intelligent men than skilled workmen, as again was indicated in the French system.

As President of the Royal Society, he was on the above-mentioned Committee of the Guilds from 1883 to 1885, and on December 10, 1883, distributed the prizes in connection with the institution in the Clothworkers' Hall. After sketching the inception of the whole scheme, he referred to the Central Institute, then in course of building (begun in 1882, it was finished in 1884; the Technical College, Finsbury, was older by a year), and spoke of the difficulties in the way of organising such an institution:—

That building is simply the body, not the flesh and bones, but the bricks and stones, of the Central Institute, and the business upon which Sir F. Bramwell and my other colleagues on the Committee have been so much occupied, is the making a soul for this body; and I can assure you making a soul for anything is an amazingly difficult operation. You are always in danger of doing as the man in the story of Frankenstein did, and making something which will eventually devour you instead of being useful to you.

And here I may give a letter which refers to the movement for technical education, and the getting the City Com-

panies under way in the matter. In the words of Mr. George Howell, M.P.,\* it has an additional interest "as indicating the nature of his own epitaph"; as a man "whose highest ambition ever was to uplift the masses of the people and promote their welfare intellectually, socially, and industrially."

4 MARLBOROUGH PLACE, N.W., Jan. 2, 1880.

DEAR MR. HOWELL—Your letter is a welcome New Year's gift. There are two things I really care about—one is the progress of scientific thought, and the other is the bettering of the condition of the masses of the people by bettering them in the way of lifting themselves out of the misery which has hitherto been the lot of the majority of them. Posthumous fame is not particularly attractive to me, but, if I am to be remembered at all, I would rather it should be as "a man who did his best to help the people" than by other title. So you see it is no small pleasure and encouragement to me to find that I have been, and am, of any use in this direction.

Ever since my experience on the School Board, I have been convinced that I should lose rather than gain by entering directly into politics. . . . But I suppose I have some ten years of activity left in me, and you may depend upon it I shall lose no chance of striking a blow for the cause I have at heart. I thought the time had come the other day at the Society of Arts, and the event proves I was not mistaken. The animal is moving, and by a judicious exhibition of carrots in front and kicks behind, we shall get him into a fine trot presently. In the meantime do not let the matter rest. . . . The (City) companies should be constantly reminded that a storm is brewing. There are excellent men among them, who want to do what is right, and need help against the sluggards and reactionaries. It will be best for me to be quiet for a while, but you will understand that I am watching for the turn of events.—I am, yours very faithfully,

T. H. HUXLEY.

This summer, too, he delivered a course on Biology for Teachers at South Kensington, and published not only his *American Addresses*, but also the *Physiography*, founded upon the course delivered seven weeks before. The book, of which 3386 copies were sold in the first six weeks, was fruitful in two ways; it showed that a geographical subject

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\* Who sent it to the *Times* (July 3, 1895) just after Huxley's death.

could be invested with interest, and it set going what was almost a new branch of teaching in natural science, even in Germany, the starting place of most educational methods, where it was immediately proposed to bring out an adaptation of the book, substituting, *c.g.* the Elbe for the Thames, as a familiar example of river action.

He was immensely pleased by a letter from Mr. John Morley, telling how his step-son, a boy of non-bookish tastes, had been taken with it. "My step-son was reading it the other night. I said, 'Isn't it better to read a novel before going to bed, instead of worrying your head over a serious book like that?' 'Oh,' said he, 'I'm at an awfully interesting part, and I can't leave off.'" It was, Mr. Morley continued, "the way of making Nature, as she comes before us every day, interesting and intelligible to young folks."

To this he replied on December 14:—

I shall get as vain as a peacock if discreet folk like you say such pretty things to me as you do about the *Physiography*.

But it is very pleasant to me to find that I have succeeded in what I tried to do. I gave the lectures years ago to show what I thought was the right way to lead young people to the study of nature—but nobody would follow suit—so now I have tried what the book will do.

Your step-son is a boy of sense, and I hope he may be taken as a type of the British public!

A good deal of time was taken up in the first half of the year by the Scottish Universities Commission, which necessitated his attendance in Edinburgh the last week in February, the first week in April, and the last week in July. He had hoped to finish off the necessary business at the first of these meetings, but no sooner had he arrived in Edinburgh, after a pleasant journey down with J. A. Froude, than he learned that "the chief witness we were to have examined to-day, and whose due evisceration was one of the objects of my coming, has telegraphed to say he can't be here." Owing to this and to the enforced absence of the judges on the Commission from some of the sittings, it was found necessary to have the additional meetings at Easter, much to his disgust. He writes:—

I am sorry to say I shall have to come here again in Easter week. It is the only time the Lord President is free from his courts, and although we all howled privately, there was no help for it. Whether we finish then or not will depend on the decision of the Government, as to our taking up the case of you troublesome women, who want admission into the University (very rightly too I think). If we have to go into this question it will involve the taking of new evidence and no end of bother. I find my colleagues very reasonable, and I hope some good may be done, that is the only consolation.

I went out with Blackie last evening to dine with the Skeltons, at a pretty place called the Hermitage, about three miles from here. . . . Blackie and I walked home with snow on the ground and a sharp frost. I told you it would turn cold as soon as I got here, but I am none the worse.

It was just the same in April:—

It is quite cold here as usual, and there was ice on the ponds we passed this morning. . . . I am much better lodged than I was last time, for the same thanks to John Bruce, but I do believe that the Edinburgh houses are the coldest in the universe. In spite of a good breakfast and a good fire, the half of me that is writing to you is as cold as charity.

*April 4.*—We toil at the Commission every day, and don't make any rapid progress. An awful fear creeps over me that we shall not finish this bout.

While he was in Edinburgh for the third time, his attention was called to an article in the *Echo*, the organ of the anti-vivisection party. He writes:—

The *Echo* is pretty. It is one of a long series of articles from the same hand, but I don't think they hurt anybody and they evidently please the writer. For some reason or other they have not attacked me yet, but I suppose my turn will come.

Again:—

Thank you for sending me John Bright's speeches. They are very good, but hardly up to his old mark of eloquence. Some parts are very touching.

His health was improving, as he notes with satisfaction:

Every day this week we have had about four hours of the Commission, and I have dined out four days out of the six.

But I'm no the waur, and the late dinners have not been visited by fits of morning blue devils. So I am in hopes that I am getting back to the normal state that Clark prophesied for me.

4 MARLBOROUGH PLACE, LONDON, N.W.,

April 29, 1877.

MY DEAR SKELTON—Best thanks for your second edition. You paint the system\* in such favourable colours, that I am thinking of taking advantage of it for my horde of "young barbarians." I am sure Scotch air would be of service to them—and in after-life they might have the inestimable advantage of a quasi-Scotch nationality—that greatest of all practical advantages in Britain.

We are to sit again in the end of July when Mrs. Skelton and you if you are wise, will be making holiday.

Your invitation is most tempting, and if I had no work to do I should jump at it.

But alas! I shall have a deal of work, and I must go to my Patmos in George Street. Ingrained laziness is the bane of my existence; and you don't suppose that with the sun shining down into your bosky dell, and Mrs. Skelton radiant, and Froude and yourself nicotiant, I am such a Philistine as to do a stroke of work?—Ever yours very faithfully,

T. H. HUXLEY.

From Edinburgh he went to St. Andrews to make arrangements for his elder son to go to the University there as a student the following winter. Then he paid a visit to Sir W. Armstrong in Northumberland, afterwards spending a month at Whitby. His holiday work consisted in a great part of the article on "Evolution" for the *Encyclopædia Britannica*, which is noted as finished on October 24, though not published till the next year.

In November the honorary degree of LL.D. was conferred upon Charles Darwin at Cambridge, "a great step for Cambridge, though it may not seem much in itself," he writes to Dohrn, November 21. In the evening after the public ceremony there was a dinner of the Philosophical Club, at which he spoke in praise of Darwin's services to science. Darwin himself was unable to be present, but re-

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\* *i.e.* of Scotch education.

ceived an enthusiastic account of the proceedings from his son, and wrote to thank Huxley, who replied:—

4 MARLBOROUGH PLACE, *Nov.* 21, 1877.

MY DEAR DARWIN—Nothing ever gave me greater pleasure than the using the chance of speaking my mind about you and your work which was afforded me at the dinner the other night. I said not a word beyond what I believe to be strictly accurate: and, please Sir, I didn't sneer at anybody. There was only a little touch of the whip at starting, and it was so tied round with ribbons that it took them some time to find out where the flick had hit.

T. H. HUXLEY.

He writes to his wife:—

I will see if I can recollect the speech. I made a few notes sitting in Dewar's room before the dinner. But as usual I did not say some things I meant to say, and said others that came up on the spur of the moment.

And again:—

Please I didn't say that Réaumur was the other greatest scientific man since Aristotle. But I said that in a certain character of his work he was the biggest man between Aristotle and Darwin. I really must write out an "authorised version" of my speech. I hear the Latin oration is to be in *Nature* this week, and Lockyer wanted me to give him the heads of my speech, but I did not think it would be proper to do so, and refused. I have written out my speech as well as I can recollect it. I do not mind any friend seeing it, but you must not let it get about as the dinner was a private one.

The notes of his speech run as follows:—

MR. PRESIDENT—I rise with pleasure and with alacrity to respond to the toast which you have just proposed, and I may say that I consider one of the greatest honours which have befallen me, to be called upon to represent my distinguished friend Mr. Darwin upon this occasion. I say to represent Mr. Darwin, for I cannot hope to personate him, or to say all that would be dictated by a mind conspicuous for its powerful humility and strong gentleness.

Mr. Darwin's work had fully earned the distinction you have to-day conferred upon him four and twenty years ago; but I doubt not that he would have been found in that circum-



stance an exemplification of the wise foresight of his revered intellectual mother. Instead of offering her honours when they ran a chance of being crushed beneath the accumulated marks of approbation of the whole civilised world, the University has waited until the trophy was finished, and has crowned the edifice with the delicate wreath of academic appreciation.

This is what I suppose Mr. Darwin might have said had he been happily able to occupy my place. Let me now speak in my own person and in obedience to your suggestion, let me state as briefly as possible what appear to me to be Mr. Darwin's distinctive merits.

From the time of Aristotle to the present day I know of but one man who has shown himself Mr. Darwin's equal in one field of research—and that is Réaumur. In the breadth of range of Mr. Darwin's investigations upon the ways and works of animals and plants, in the minute patient accuracy of his observations, and in the philosophical ideas which have guided them, I know of no one who is to be placed in the same rank with him except Réaumur.

Secondly, looking back through the same long period of scientific history, I know of but one man, Lyonnet, who not being from his youth a trained anatomist, has published such an admirable minute anatomical research as is contained in Mr. Darwin's work on the Cirripedes.

Thirdly, in that region which lies between Geology and Biology, and is occupied by the problem of the influence of life on the structure of the globe, no one, so far as I know, has done a more brilliant and far-reaching piece of work than the famous book upon Coral Reefs.

I add to these as incidental trifles the numerous papers on Geology, and that most delightful of popular scientific books, the *Journal of a Naturalist*, and I think I have made out my case for the justification of to-day's proceedings.

But I have omitted something. There is the *Origin of Species*, and all that has followed it from the same marvellously fertile brain.

Most people know Mr. Darwin only as the author of this work, and of the form of evolutionary doctrine which it advocates. I desire to say nothing about that doctrine. My friend Dr. Humphry has said that the University has by to-day's proceedings committed itself to the doctrine of evolution. I can only say "I am very glad to hear it." But whether that doctrine be true or whether it be false, I wish to express the deliberate

opinion, that from Aristotle's great summary of the Biological knowledge of his time down to the present day, there is nothing comparable to the *Origin of Species*, as a connected survey of the phenomena of life permeated and vivified by a central idea. In remote ages the historian of science will dwell upon it as the starting-point of the Biology of his present and our future.

My friend Dr. Humphry has adverted to somebody about whom I know nothing, who says that the exact and critical studies pursued in this University are ill-calculated to preserve a high tone of mind.

I presume that this saying must proceed from some one wholly unacquainted with Cambridge. Whoever he may be, I beg him, if he can, to make the acquaintance of Charles Darwin.

In Mr. Darwin's name I beg leave to thank you for the honour you have done him.

It happened that the quadrennial election of a Lord Rector at St. Andrews University fell in this year, and on behalf of a number of students, Huxley received a telegram from his son, now newly entered at St. Andrews, asking him to stand. He writes to his wife:—

That boy of yours has just sent me a telegram, which I enclose. I sent back message to say that as a Commissioner on the Scotch Universities I could not possibly stand. The cockerel is beginning to crow early. I do believe that to please the boy I should have assented to it if it had not been for the R. Commission.

#### Apropos of controversies (November 23)

We had a grand discussion at the Royal Society last night between Tyndall and Burdon Sanderson. The place was crammed, and we had a late sitting. I'm not sure, however, that we had got much further at the end than at the beginning, which is a way controversies have.

The following story is worth recording, as an illustration not only of the way in which Huxley would give what help was in his power to another man of science in distress, but of the ready aid proffered on this, as on many other occasions, by a wealthy northern merchant who was interested in science. A German scientific worker in England, whom we will call H., had fallen into distress, and applied to him

for help, asking if some work could not be put in his way. Huxley could think of nothing immediate but to suggest some lessons in German literature to his children, though in fact they were well provided for with a German governess; nevertheless he thought it a proper occasion to avail himself of his friend's offer to give help in deserving cases. He writes to his wife:—

I made up my mind to write to X. the day before yesterday; this morning by return of post he sends me a cheque not only for the £60 which I said H. needed, but £5 over for his present needs with a charming letter.

It came in the nick of time, as H. came an hour or two after it arrived, and with many apologies told me he was quite penniless. The poor old fellow was quite overcome when I told him how matters stood, and it was characteristic that as soon as he got his breath again, he wanted to know when he would begin teaching the children! I sent him to get an order on the Naples bank for the discharge of his debt there. X.'s express stipulation was that his name should not be mentioned, so mind you say not a word about his most kind and generous act.

The following letters of miscellaneous interest were written in this year:—

4 MARLBOROUGH PLACE, *Nov.* 21, 1877.

MY DEAR MORLEY—I am always at the command of the *Fortnightly* so long as you are editor, but I don't think that the Belemnite \* business would do for you. The story would hardly be intelligible without illustrations.

There are two things I am going to do which may be more to the purpose. One is a screed on Technical Education which I am going to give to the Working Men's Union on the 1st December.

The other is a sort of Éloge on Harvey at the Royal Institution in March apropos of his 300th birthday—which was All-fools Day.

You shall have either of these you like, but I advise Harvey; as if I succeed in doing what I shall aim at it will be interesting.

Why the deuce do you live at Brighton? St. John's Wood is far less cockneyfied, and its fine and Alpine air would be

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\* The lecture at the London Institution mentioned above.

much better for you, and I believe for Mrs. Morley, than the atmosphere of the melancholy main, the effects of which on the human constitution have been so well expounded by that eminent empiric, Dr. Dizzy.

Anyhow, I wish we could see something of you now and then.—Ever yours very faithfully, T. H. HUXLEY.

Darwin got his degree with great *éclat* on Saturday. I had to return thanks for his health at the dinner of the Philosophical Society; and oh! I chaffed the dons so sweetly.

4 MARLBOROUGH PLACE, N.W., *Nov. 27, 1877.*

MY DEAR MORLEY—You shall have both the articles—if it is only that I may enjoy the innocent pleasure of Knowles' face when I let him know what has become of them.

Stormy ocean, forsooth! I back the storm and rain through which I came home to-night against anything London-super-mare has to show.

I will send the MS. to Virtue as soon as it is in a reasonable state.—Ever yours very faithfully, T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., *Jan. 8, 1878.*

MY DEAR MORLEY—Many thanks for the cheque. In my humble judgment it is quite as much as the commodity is worth.

It was a great pleasure to us all to have you with us on New Year's Day. My wife claims it as her day, and I am not supposed to know anything about the guests except Spencer and Tyndall. None but the very elect are invited to the sacred feast—so you see where you stand among the predestined who cannot fall away from the state of grace.

I have not seen Spencer in such good form and good humour combined for an age.

I am working away at Harvey, and will send the MS. to Virtue's as soon as I am sufficiently forward.—Ever yours very faithfully, T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Dec. 9, 1877.*

MY DEAR TYNDALL—I am so sorry to have been out when Mrs. Tyndall called to-day. By what we heard at the *x* on Thursday, I imagined you were practically all right again, or I should have been able to look after you to-day.

But what I bother you with this note for is to beg you not to lecture at the London Institution to-morrow, but to let me

change days with you, and so give yourself a week to recover. And if you are seedy, then I am quite ready to give them another lecture on the Hokyopotamus or whatever else may turn up.

But don't go and exert yourself in your present condition. These severe colds have often nothing very tangible about them, but are not to be trifled with when folks are past fifty.

Let me have an answer to say that I may send a telegram to Nicholson first thing to-morrow morning to say that I will lecture *vice* you. My "bottled life," as Hutton calls it in the *Spectator*\* this week, is quite ready to go off.

Now be a sane man and take my advice.—Ever yours very faithfully,  
T. H. HUXLEY.

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\* The *Spectator* for Dec. 8, 1877, began an article thus:—"Professor Huxley delivered a very amusing address last Saturday at the Society of Arts, on the very unpromising subject of technical education; but we believe that if Professor Huxley were to become the President of the Social Science Association, or of the International Statistical Congress, he would still be amusing, so much bottled life does he infuse into the driest topic on which human beings ever contrived to prose."

## CHAPTER XXXIII

1878

THE year 1878 was the tercentenary of Harvey's birth, and Huxley was very busy with the life and work of that great physician. He spoke at the memorial meeting at the College of Physicians (July 18), he gave a lecture on Harvey at the Royal Institution on January 25, afterwards published in *Nature* and the *Fortnightly Review*, and intended to write a book on him in a projected *English Men of Science* series (see p. 536).

I am very glad you like "Harvey" (he writes to Prof. Baynes on Feb. 11). He is one of the biggest scientific minds we have had. I expect to get well vilipended not only by the anti-vivisection folk, for the most of whom I have a hearty contempt, but *apropos* of Bacon. I have been oppressed by the humbug of the "Baconian Induction" all my life, and at last *the worm has turned*.

Now in this lecture he showed that Harvey employed vivisection to establish the doctrine of the circulation of the blood, and furthermore, that he taught this doctrine before the *Novum Organum* was published, and that his subsequent *Exercitatio* displays no trace of being influenced by Bacon's work. After glancing at the superstitious reverence for the "Baconian Induction," he pointed out Bacon's ignorance of the progress of science up to his time, and his inability to divine the importance of what he knew by hearsay of the work of Copernicus, or Kepler, or Galileo; of Gilbert, his contemporary, or of Galen; and wound up by quoting Ellis's severe judgment of Bacon in the General Preface to the *Philosophic Works*, in Spedding's classical edition (p. 38):—

“ That his method is impracticable cannot, I think, be denied, if we reflect, not only that it never has produced any result, but also that the process by which scientific truths have been established cannot be so presented as even to appear to be in accordance with it.”

How early this conviction had forced itself upon him, I cannot say; but it was certainly not later than 1859, when the *Origin of Species* was constantly met with “ Oh, but this is contrary to the Baconian method.” He had long felt what he expresses most clearly in the “ Progress of Science ” (*Coll. Ess.* i. 46–57) that Bacon’s “ majestic eloquence and fervid vaticinations ” which “ drew the attention of all the world to the ‘ new birth of Time ’ ” were yet, for all practical results on discovery, “ a magnificent failure.” The desire for “ fruits ” has not been the great motive of the discoverer; nor has discovery waited upon collective research. “ Those who refuse to go beyond fact,” he writes, “ rarely get as far as fact; and any one who has studied the history of science knows that almost every great step therein has been made by the ‘ anticipation of nature,’ that is, by the invention of hypotheses, which, though verifiable, often had very little foundation to start with; and, not unfrequently, in spite of a long career of usefulness, turned out to be wholly erroneous in the long-run.”

Thus he had been led to a settled disbelief in Bacon’s scientific greatness, that reasoned “ prejudice ” against which Spedding himself was moved to write twice in defence of Bacon. In his first letter he criticised a passage in the lecture touching this question. On the one hand, he remarks, “ Bacon would probably have agreed with you as to his pretensions as a scientific discoverer (he calls himself a bellman to call other wits together, or a trumpeter, or a maker of bricks for others to build with).” On the other hand, he asks, ought a passage from a fragment—the *Temporis partus masculus*—unpublished in Bacon’s lifetime, to be treated as one of his representative opinions?

In his second letter he adduces, on other grounds, his own more favourable impression of Bacon’s philosophical influence. A peculiar interest of this letter lies in its testi-

mony to the influence of Huxley's writings even on his elder contemporaries.

FROM JAMES SPEDDING

Feb. 1, 1878.

. . . When you admit that you study Bacon with a *prejudice*, you mean of course an unfavourable opinion previously formed on sufficient grounds. Now I am myself supposed to have studied him with a prejudice the other way: but this I cannot admit, in any sense of the word; for when I first made his acquaintance I had no opinion or feeling about him at all—more than the ordinary expectation of a young man to find what he is told to look for. My earliest impression of his character came probably from Thompson—whose portrait of him, except as touched and softened by the tenderer hand of “the sweet-souled poet of the Seasons,” did not differ from the ordinary one. It was not long indeed before I did begin to form an opinion of my own; one of those *after-judgments* which are liable to be mistaken for prejudices by those who judge differently, and which, being formed, do, no doubt, tell upon the balance. For it was not long before I found myself indebted to him for the greatest benefit probably that any man, living or dead, can confer on another. In my school and college days I had been betrayed by an ambition to excel in themes and declamations into the study, admiration, and imitation of the rhetoricians. In the course of my last long vacation—the autumn of 1830—I was inspired with a new ambition, namely, to think justly about everything which I thought about at all, and to act accordingly; a conviction for which I cannot cease to feel grateful, and which I distinctly trace to the accident of having in the beginning of that same vacation given two shillings at a second-hand bookstall for a little volume of Dove's classics, containing the *Advancement of Learning*. And if I could tell you how many superlatives I have since that time degraded into the positive; how many innumerable and infinites I have replaced by counted numbers and estimated quantities; how many assumptions, important to the argument in hand, I have withdrawn because I found on more consideration that the fact might be explained otherwise; and how many effective epithets I have discarded when I found that I could not fully verify them; you would think it no less than just that I should claim for myself and concede to others the right of being judged by the last edition rather than the first. That a persistent en-



deavour to free myself from what you regard as Bacon's characteristic vice should have been the fruit of a desire to follow his example, will seem strange to you, but it is fact. Perhaps you will think it not less strange, but it is my real belief, that if your own writings had been in existence and come in my way at the same critical stage of my moral and mental development, they would have taught me the same lesson and inspired me with the same ambition; for in that particular (if I may say it without offence) I look upon you *both* as eminent examples of the *same* virtue.

To the lecture he refers once more in a letter to Mr. John Morley. The political situation touched on in this and the next letter, is that of the end of the Russo-Turkish war and the beginning of the Afghan war.

SCIENCE SCHOOLS, SOUTH KENSINGTON,  
*Feb. 7, 1878.*

MY DEAR MORLEY—Many thanks for the cheque, and still more for the good word for the article.\* I knew it would "draw" Hutton, and his ingenuity has as usual made the best of the possibilities of attack. I am glad to find, however, that he does not think it expedient to reiterate his old story about the valuelessness of vivisection in the establishment of the doctrine of the circulation.

I hear that that absurd creature R— goes about declaring that I have made all sorts of blunders. Could not somebody be got to persuade him to put what he has to say in black and white?

Controversy is as abhorrent to me as gin to a reclaimed drunkard; but oh dear! it would be so nice to squelch that pompous impostor.

I hope you admire the late aspects of the British Lion. His tail goes up and down from the intercrural to the stiffly erect attitude per telegram, while his head is sunk in the windbag of the House of Commons.

I am beginning to think that a war would be a good thing if only for the inevitable clean sweep of all the present governing people which it would bring about.—Ever yours very faithfully,

T. H. HUXLEY.

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\* On Harvey.

## TO HIS ELDEST DAUGHTER

SCIENCE SCHOOLS, SOUTH KENSINGTON,  
Dec. 7, 1878.

DEAREST JESS—You are a badly used young person—you are; and nothing short of that conviction would get a letter out of your still worse used Pater the *bête noire* of whose existence is letter-writing.

Catch me discussing the Afghan question with you you little pepper pot. No, not if I know it. Read Fitzjames Stephen's letter in the *Times*, also Bartle Frere's memorandum, also Napier of Magdala's memo. Them's my sentiments.

Also read the speech of Lord Hartington on the address. He is a man of sense like his father, and you will observe that he declares that the Government were perfectly within their right in declaring war without calling Parliament together. . . .

If you had lived as long as I have and seen as much of men, you would cease to be surprised at the reputations men of essentially commonplace powers—aided by circumstances and some amount of cleverness—obtain.

I am as strong for justice as any one can be, but it is real justice, not sham conventional justice which the sentimentalists howl for.

At this present time real justice requires that the power of England should be used to maintain order and introduce civilisation wherever that power extends.

The Afghans are a pack of disorderly treacherous blood-thirsty thieves and caterans who should never have been allowed to escape from the heavy hand we laid upon them, after the massacre of twenty thousand of our men, women (and) children in the Khoord Cabul Pass thirty years ago.

We have let them be, and the consequence is they now lend themselves to the Russians, and are ready to stir up disorder and undo all the good we have been doing in India for the last generation.

They are to India exactly what the Highlanders of Scotland were to the Lowlanders before 1745; and we have just as much right to deal with them in the same way.

I am of opinion that our Indian Empire is a curse to us. But so long as we make up our minds to hold it, we must also make up our minds to do those things which are needful to hold it effectually, and in the long-run it will be found that so doing is

real justice both for ourselves, our subject population, and the Afghans themselves.

There, you plague.—Ever your affec. Daddy,

T. H. HUXLEY.

A few days later he writes to his son:—

The Liberals are making fools of themselves, and “the family” declare I am becoming a Jingo! Another speech from Gladstone is expected to complete my conversion.

Among other occupations he still had to attend the Scottish Universities Commission, for which he wrote the paragraph on examinations in its report; he lectured on the Hand at the Working Men’s College; prepared new editions of the *Physiography*, *Elementary Physiology*, and *Vertebrate Anatomy*, and at length brought out the *Introductory Primer* in the Science Primer Series, in quite a different form from what he had originally sketched out. But his chief interest lay in the Invertebrata. From April 29 to June 3 he lectured to working men at Jermyn Street upon the Crayfish; read a paper on the Classification and Distribution of Crayfishes at the Zoological Society on June 4, and lectured at the Zoological Gardens weekly from May 17 to June 21 on Crustaceous Animals. In all this work lay the foundations of his subsequent book on the Crayfish, which I find jotted down in the notes of this year to be written as an introduction to *Zoology*, together with the “Dog,” as an introduction to the *Mammalia*, and *Man*—already dealt with in *Man’s Place in Nature*—as an introduction to *Anthropology*. This projected series is completed with a half erased note of an introduction to *Psychology*, which perhaps found some expression in parts of the *Hume*, also written this year.

He notes down also, work on the Ascidians, and on the morphology of the Mollusca and Cephalopods brought back by the *Challenger*, in connection with which he now began the monograph on the rare creature *Spirula*, a remarkable piece of work, being based upon the dissections of a single specimen, but destined never to be completed by his hand, though his drawings were actually engraved, and nothing

remained but to put a few finishing touches and to write detailed descriptions of the plates.

Letters to W. K. Parker and Professor Haeckel touch on this part of his work; the former, indeed, offering a close parallel to a story, obviously of the same period, which the younger Parker tells in his reminiscences, to illustrate the way in which he would be utterly engrossed in a subject for the time being. Jeffery Parker, while demonstrator of biology, came to him with a question about the brain of the codfish at a time when he was deep in the investigation of some invertebrate group. "Codfish?" he replied, "that's a vertebrate, isn't it? Ask me a fortnight hence, and I'll consider it."

4 MARLBOROUGH PLACE, *Sept.* 25, 1878.

MY DEAR PARKER—As far as I recollect *Anniocates* is a vertebrated animal—and I ignore it.

The paper you refer to was written by my best friend—a careful kind of man—and I am sure that he saw what he says he saw, as if I had seen it myself.

But what the fact may mean and whether it is temporary or permanent—is thy servant a dog that he should worry himself about other things with backbones? Not if I know it.

Churchill has got over a whole batch of the American edition of the *Vertebrata*, so I have a respite. Mollusks are far more interesting—bugs sweeter—while the dinner crayfish hath no parallel for intense and absorbing interest in the three kingdoms of Nature.

What saith the Scripture? "Go to the ANT thou sluggard." In other words, study the Invertebrata.—Ever yours very faithfully,  
T. H. HUXLEY.

[Sketch of a vast winged ant advancing on a midget, and saying, as it looks through a pair of eyeglasses, "well, really, what an absurd creature!!" ]

4 MARLBOROUGH PLACE, LONDON,

*April* 28, 1878.

MY DEAR HAECKEL—Since the receipt of your letter three months ago, I have been making many inquiries about *Medusa* for you, but I could hear of none—and so I have delayed my reply, until I doubt not you have been blaspheming my apparent neglect.

My "Sammlung"!!\* My dear friend, my cabin on board H.M.S. *Rattlesnake* was 7 feet long, 6 feet wide, and 5 feet 6 inches high. When my bed and my clothes were in it, there was not much room for any collection, except the voluntary one made by some thousands of specimens of *Blatta Orientalis*,† with whose presence I should have been very glad to dispense.

My *Medusa* were never published. I have heaps of notes and drawings and half-a-dozen engraved plates. But after the publication of the *Oceanic Hydrozoa* I was obliged to take to quite other occupations, and all that material is like the "full many a flower, born to blush unseen," of our poet.

If you would pay us a visit you should look through the whole mass, if you liked, and you might find something interesting.

At present, I am very busy about Crayfishes (Flusskrebse) working out the relations between their structure and their Geographical Distribution, which are very curious and interesting.

I have also nearly finished the anatomy of *Spirula* for the *Challenger*. It is essentially a cuttlefish, and the shell is really internal. With only one specimen, it has been a long and troublesome job—but I shall establish all the essential points and give half-a-dozen plates of anatomy.

You will recollect my eldest little daughter? She is going to be married next Saturday. It is the first break in our family, and we are very sad to lose her—though well satisfied with her prospects. She is but just twenty and a charming girl, though you may put that down to fatherly partiality if you like.

The second daughter has taken to art, and will make a painter if she be wise enough not to marry for some years.

My eldest son who comes next is taller than I am. He has been at one of the Scotch Universities for the last six months; and one of these fine days, next month, you will see a fair-haired stripling asking for Herr Professor Haeckel.

I am going to send him to Jena for three months to pick up your noble vernacular; and in the meanwhile to continue his Greek and Mathematics, in which the young gentleman is fairly proficient. If you can recommend any Professor under whom he can carry on his studies, it will be a great kindness.

I will give him a letter to you, and while I beg you not to

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\* Collection.

† The cockroach.

give yourself any trouble about him, I need not say I shall be very grateful for any notice you may take of him.

I am giving him as much independence of action as possible, in order that he may learn to take care of himself.

Now that is enough about my children. Yours must yet be young—and you have not yet got to the marriage and university stage—which I assure you is much more troublesome than the measles and chicken-pox period.

My wife unites with me in kindest remembrances and good wishes.—Ever yours very faithfully, T. H. HUXLEY.

An outbreak of diphtheria among his children made the spring of 1878 a time of overwhelming anxiety. How it told upon his strong and self-contained chief is related by T. J. Parker—"I never saw a man more crushed than he was during the dangerous illness of one of his daughters, and he told me that, having then to make an after-dinner speech, he broke down for the first time in his life, and for one painful moment forgot where he was and what he had to say." This was one of the few occasions of his absence from College during the seventies. "When, after two days, he looked in at the laboratory," writes Professor Howes, "his dejected countenance and tired expression betokened only too plainly the intense anxiety he had undergone."

The history of the outbreak was very instructive. Huxley took a leading part in organising an enquiry and in looking into the matter with the health officer. "As soon as I can get all the facts together," he writes on Dec. 10, "I am going to make a great turmoil about our outbreak of diphtheria—and see whether I cannot get our happy-go-lucky local government mended." As usual, the epidemic was due to culpable negligence. In the construction of some drains, too small a pipe was laid down. The sewage could not escape, and flooded back in a low-lying part of Kilburn. Diphtheria soon broke out close by. While it was raging there, a St. John's Wood dairyman running short of milk, sent for more to an infected dairy in Kilburn. Every house which he supplied that day with Kilburn milk was attacked with diphtheria.

But with relief from this heavy strain, his spirits instantly revived, and he writes to Tyndall.

4 MARLBOROUGH PLACE, *May 20, 1878.*

MY DEAR TYNDALL—I wrote you a most downhearted letter this morning about Madge, and not without reason. But having been away four hours, I come home to find a wonderful and blessed change. The fever has abated and she is looking like herself. If she could only make herself heard, I should have some sauciness. I see it in her eyes.

If you will be so kind as to kiss everybody you meet on my account it will be a satisfaction to me. You may begin with Mrs. Tyndall!—Ever yours,  
T. H. HUXLEY.

Professor Marsh, with whom Huxley had stayed at Yale College in 1876, paid his promised visit to England immediately after this.

4 MARLBOROUGH PLACE, N.W.,  
*June 24, 1878. (Evening.)*

MY DEAR MARSH—Welcome to England! I am delighted to hear of your arrival—but the news has only just reached me, as I have been away since Saturday with my wife and sick daughter who are at the seaside. A great deal has happened to us in the last six or seven weeks. My eldest daughter married, and then a week after an invasion of diphtheria, which struck down my eldest son, my youngest daughter, and my eldest remaining daughter all together. Two of the cases were light, but my poor Madge suffered terribly, and for some ten days we were in sickening anxiety about her. She is slowly gaining strength now, and I hope there is no more cause for alarm—but my household is all to pieces—the Lares and Penates gone, and painters and disinfectors in their places.

You will certainly have to run down to Margate and see my wife—or never expect forgiveness in this world.

I shall be at the Science Schools, South Kensington, tomorrow till four—and if I do not see you before that time I shall come and look you up at the Palace Hotel.—I am, yours very faithfully,  
T. H. HUXLEY.

“Is it not provoking,” he writes to his wife, “that we should all be dislocated when I should have been so glad to show him a little attention?” Still, apart from this week-

end at the seaside, Professor Marsh was not entirely neglected. He writes in his *Recollections* (p. 6):—

How kind Huxley was to everyone who could claim his friendship, I have good cause to know. Of the many instances which occur to me, one will suffice. One evening in London at a grand annual reception of the Royal Academy, where celebrities of every rank were present, Huxley said to me, "When I was in America, you showed me every extinct animal that I had read about, or even dreamt of. Now, if there is a single living lion in all Great Britain that you wish to see, I will show him to you in five minutes." He kept his promise, and before the reception was over, I had met many of the most noted men of England, and from that evening, I can date a large number of acquaintances, who have made my subsequent visits to that country an ever-increasing pleasure.

As for his summer occupations, he writes to his eldest daughter on July 2:—

No, young woman, you don't catch me attending any congresses I can avoid, not even if F. is an artful committee-man. I must go to the British Association at Dublin—for my sins—and after that we have promised to pay a visit in Ireland to Sir Victor Brooke. After that I must settle myself down in Penmaenmawr and write a little book about David Hume—before the grindery of the winter begins.

The meeting of the British Association took place this year in the third week of August at Dublin. Huxley gave an address in the Anthropological subsection,\* and on the 20th received the honorary degree of LL.D. from Dublin University, the Public Orator presenting him in the following words:—

Præsentō vobis Thomam Henricum Huxley—hominem vere physicum—hominem facundum, lepidum, venustum—eundem autem nihil (philosophia modo sua lucem præferat) reformidantem—ne illud quidem Ennianum,

Simia quam similis, turpissima bestia, nobis.

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\* "Informal Remarks on the Conclusions of Anthropology," *B. A. Report*, 1878, pp. 573-578.



The extract above given contains the first reference to the book on Hume,\* written this summer as a holiday occupation at Penmaenmawr. The speed at which it was composed is remarkable, even allowing for his close knowledge of the subject, acquired many years before. Though he had been "picking at it" earlier in the summer, the whole of the philosophical part was written during September, leaving the biographical part to be done later.

The following letters from Marlborough Place show him at work upon the book:—

*March 31, 1878.*

MY DEAR MORLEY—I like the notion of undertaking your Hume book, and I don't see why I should not get it done this autumn. But you must not consider me pledged on that point, as I cannot quite command my time.

Tulloch sent me his book on Pascal. It was interesting as everything about Pascal must be, but Tulloch is not a model of style.

I have looked into Bruton's book, but I shall now get it and study it. Hume's correspondence with Rousseau seems to me typical of the man's sweet, easy-going nature. Do you mean to have a portrait of each of your men? I think it is a great comfort in a biography to get a notion of the subject in the flesh.

I have rather made it a rule not to part with my property in my books—but I daresay that can be arranged with Macmillan. Anyhow I shall be content to abide by the general arrangement if you have made one.

We have had a bad evening. Clifford has been here, and he is extremely ill—in fact I fear the worst for him.

It is a thousand pities, for he has a fine nature all round, and time would have ripened him into something very considerable. We are all very fond of him.—Ever yours very faithfully,  
T. H. HUXLEY.

*July 6, 1878.*

MY DEAR MORLEY—Very many thanks for Diderot. I have made a plunge into the first volume and found it very interesting. I wish you had put a portrait of him as a frontispiece. I have seen one—a wonderful face, something like Goethe's.

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\* In the "English Men of Letters" series, edited by Mr. John Morley.

I am picking at Hume at odd times. It seems to me that I had better make an analysis and criticism of the "Inquiry," the backbone of the essay—as it touches all the problems which interest us most just now. I have already sketched out a chapter on Miracles, which will, I hope, be very edifying in consequence of its entire agreement with the orthodox arguments against Hume's *a priori* reasonings against miracles.

Hume wasn't half a sceptic after all. And so long as he got deep enough to worry Orthodoxy, he did not care to go to the bottom of things.

He failed to see the importance of suggestions already made both by Locke and Berkeley.—Ever yours very faithfully,

T. H. HUXLEY.

Sept. 30, 1878.

MY DEAR MORLEY—Praise me! I have been hard at work at Hume at Penmaenmawr, and I have got the hard part of the business—the account of his philosophy—blocked out in the bodily shape of about 180 pages foolscap MS.

But I find the job as tough as it is interesting. Hume's diamonds, before the public can see them properly, want a proper setting in a methodical and consistent shape—and that implies writing a small psychological treatise of one's own, and then cutting it down into as unobtrusive a form as possible.

So I am working away at my draught—from the point of view of an æsthetic jeweller.

As soon as I get it into such a condition as will need only verbal trimming, I should like to have it set up in type. For it is a defect of mine that I can never judge properly of any composition of my own in manuscript.

Moreover (don't swear at this wish) I should very much like to send it to you in that shape for criticism.

The Life will be an easy business. I should like to get the book out of hand before Christmas, and will do so if possible. But my lectures begin on Tuesday, and I cannot promise.—Ever yours very faithfully,

T. H. HUXLEY.

Oct. 21, 1878.

MY DEAR MORLEY—I have received slips up to chap. ix. of Hume, and so far I do not think (saving your critical presence) that there will be much need of much modification or interpolation.

I have made all my citations from a 4-vol. edition of Hume,

published by Black and Tait in 1826, which has long been in my possession.

Do you think I ought to quote Green and Grose's edition? It will be a great bother, and I really don't think that the understanding of Hume is improved by going back to eighteenth-century spelling.

I am at work upon the *Life*, which should not take long. But I wish that I had polished that off at Penmaenmawr as well. What with lecturing five days a week, and toiling at two anatomical monographs, it is hard to find time.

As soon as I have gone through all the eleven chapters about the *Philosophy*—I will send them to you and get you to come and dine some day—after you have looked at them—and go into it.—Ever yours very faithfully,

T. H. HUXLEY.

SCIENCE SCHOOLS, S. KENSINGTON, *Oct.* 29, 1878.

MY DEAR MORLEY—Your letter has given me great pleasure. For though I have thoroughly enjoyed the work, and seemed to myself to have got at the heart of Hume's way of thinking, I could not tell how it would appear to others, still less could I pretend to judge of the literary form of what I had written. And as I was quite prepared to accept your judgment if it had been unfavourable, so being what it is, I hug myself proportionately and begin to give myself airs as a man of letters.

I am through all the interesting part of Hume's life—that is, the struggling part of it—and David the successful and the *fêted* begins rather to bore me, as I am sorry to say most successful people do. I hope to send the first chapter to press in another week.

Might it not be better, by the way, to divide the little book into two parts?

Part I.—*Life, Literary and Political work.*

Part II.—*Philosophy,*

subdividing the latter into chapters or sections? Please tell me what you think.

I have not received the last chapter from the printer yet. When I do I will finish revising, and then ask you to come and have a symposium over it.—Ever yours very faithfully,

T. H. HUXLEY.

*P.S.*—Macmillan has a lien on "*The Hand.*" I gave part of the lecture in another shape at Glasgow two years ago, and M. had it reported for his magazine. If he is good and patient he will get it in some shape some day!

4 MARLBOROUGH PLACE, N.W., Nov. 5, 1878.

MY DEAR MORLEY—"Davie's" philosophy is now all in print, and all but a few final pages of his biography.

So I think the time has come when that little critical symposium may take place.

Can you come and dine on Tuesday next (12) at 7, or if any day except Wednesday 15th, next week, will suit you better, it will do just as well for me. There will be nobody but my wife and daughters, so don't dress.—Ever yours very faithfully,

T. H. HUXLEY.

*P.S.*—Will you be disgusted if in imitation of the "English Men of Letters" I set a-going an "English Men of Science." Few people have any conception of the part Englishmen have played in science, and I think it would be both useful and interesting to bring the truth home to the English mind.

I had about three thousand people to hear me on Saturday at Manchester, and it would have done you good to hear how they cheered at my allusion to personal rule. I had to stop and let them ease their souls.

Behold my *P.S.* is longer than my letter. It's the strong feminine element in my character oozing out. "Desinit in piscem" though, and a mighty queer fish too.

4 MARLBOROUGH PLACE, Jan. 12, 1879.

DEAR LECKY—I am very much obliged for your suggestion about the note at p. 9. I am ashamed to say that though the eleven day correction was familiar enough to me, I had never thought about the shifting of the beginning of the year till you mentioned it. It is a law of nature, I believe, that when a man says what he need not say he is sure to blunder. The note shall go out.

All I know about Sprat is as the author of a dull history of the Royal Society, so I was surprised to meet with Hume's estimate of him.

No doubt about the general hatred of the Scotch, but you will observe that I make Millar responsible for the peace-making assurance.

What you said to me in conversation some time ago led me to look at Hume's position as a moralist with some care, and I quoted the passage at p. 206 that no doubt might be left on the matter.

The little book threatened to grow to an undue length, and

therefore the question of morals is treated more briefly than was perhaps desirable.—Ever yours very faithfully,

T. H. HUXLEY.

Early in November I find the first reference to a proposed, but never completed, "English Men of Science" series in the letter to Mr. Morley above. The following letters, especially those to Sir H. Roscoe, with whom he was concerting the series, give some idea of its scope:—

4 MARLBOROUGH PLACE, N.W., *Dec.* 10, 1878.

MY DEAR ROSCOE—You will think that I have broken out into letter-writing in a very unwonted fashion, but I forgot half of what I had to say this morning.

After a good deal of consultation with Macmillans, who were anxious that the "English Men of Science" series should not be too extensive, I have arranged the books as follows:—

1. Roger Bacon.
2. Harvey and the Physiologists of the 17th century.
3. Robert Boyle and the Royal Society.
4. Isaac Newton.
5. Charles Darwin.
6. English Physicists, Gilbert, Young, Faraday, Joule.
7. English Chemists, Black, Priestley, Cavendish, Davy, Dalton.
8. English Physiologists and Zoologists of the 18th century, Hunter, etc.
9. English Botanists, Ray, Crew, Hales, Brown.
10. English Geologists, Hutton, Smith, Lyell.

We may throw in the astronomers if the thing goes.

Green of Leeds will undertake 10; Dyer, with Hooker's aid, 9; M. Foster 8; and I look to you for 7.

Tyndall has half promised to do Boyle, and I hope he will. Clerk Maxwell can't undertake Newton, and hints X. But I won't have X.—he is too much of a bolter to go into the tandem. I am thinking of asking Moulton, who is strongly recommended by Spottiswoode, and is a very able fellow, likely to put his strength into it.

Do you know anything about Chrystal of St. Andrews?\*

---

\* Now Professor of Mathematics at Edinburgh.



Settle your own terms with Macmillan. They will be as joyful as I shall be to know you are going to take part in the enterprise.—Ever yours faithfully,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Dec. 31, 1878.*

MY DEAR TYNDALL—I would sooner have your Boyle, however long we may have to wait for it, than anybody else's d——d simmer. (Now that's a "goak," and you must ask Mrs. Tyndall to explain it to you.)

Two years will I give you from this blessed New Year's eve, 1878, and if it isn't done on New Year's Day 1881 you shall not be admitted to the company of the blessed, but your dinner shall be sent to you between two plates to the most pestiferous corner of the laboratory of the Royal Institution. I am very glad you will undertake the job, and feel that I have a proper New Year's gift.

By the way, you ought to have had Hume ere this. Macmillan sent me two or three copies, just to keep his word, on Christmas Day, and I thought I should have a lot more at once.

But there is no sign—not even an advertisement—and I don't know what has become of the edition. Perhaps the bishops have bought it up.—With all good wishes, Ever yours,

T. H. HUXLEY.

Two letters—both to Tyndall—show his solicitude for his friends. The one speaks of a last and unavailing attempt made by W. K. Clifford's friends to save his life by sending him on a voyage (he died not long after at Madeira); the other urges Tyndall himself to be careful of his health.

4 MARLBOROUGH PLACE, *April 2, 1878.*

MY DEAR TYNDALL—We had a sort of council about Clifford at Clark's house yesterday morning—H. Thompson, Corfield, Payne, Pollock, and myself, and I am sure you will be glad to hear the result.

From the full statement of the nature of his case made by Clark and Corfield, it appears that though grave enough in all conscience, it is not so bad as it might be, and that there is a chance, I might almost say a fair chance, for him yet. It appears that the lung mischief has never gone so far as the formation of a cavity, and that it is at present quiescent, and no other organic disease is discoverable. The alarming symptom

is a general prostration—very sadly obvious when he was with us on Sunday—which, as I understand, rather renders him specially obnoxious to a sudden and rapid development of the lung disease than is itself to be feared.

It was agreed that they should go at once to Gibraltar by the P. and O., and report progress when he gets there. If strong enough he is to go on a cruise round the Mediterranean, and if he improves by this he is to go away for a year to Bogota (in S. America) which appears to be a favourable climate for such cases as his.

If he gets worse he can but return. I have done my best to impress upon him and his wife the necessity of extreme care, and I hope they will be wise.

It is very pleasant to find how good and cordial everybody is, helpful in word and deed to the poor young people. I know it will rejoice the cockles of your generous old heart to hear it.

As for yourself, I trust you are mending and allowing yourself to be taken care of by your household goddess.

With our united love to her and yourself,—Ever yours  
faithfully,

T. H. HUXLEY.

I sent your cheque to Yeo.

May, 1878.

MY DEAR TYNDALL—You were very much wanted on Saturday, as your wife will have told you, but for all that I would not have had you come on any account. You want a thorough long rest and freedom from excitement of all sorts, and I am rejoiced to hear that you are going out of the hurly-burly of London as soon as possible; and, not to be uncivil, I do hope you will stay away as long as possible, and not be deluded into taking up any exciting pursuit as soon as you feel lively again among your mountains.

Pray give up Dublin. If you don't, I declare I will try if I have enough influence with the council to get you turned out of your office of Lecturer, and superseded.

Do seriously consider this, as you will be undoing the good results of your summer's rest. I believe your heart is as sound as your watch was when you went on your memorable slide,\* but if you go slithering down avalanches of work and worry you can't always expect to pick up "the little creature" none

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\* On the Piz Morteratsch: *Hours of Exercise in the Alps*, by J. Tyndall, ch. xix.



the worse. The apparatus is by one of the best makers, but it has been some years in use, and can't be expected to stand rough work.

You will be glad to hear that we had cheerier news of Clifford on Saturday. He was distinctly better, and setting out on his Mediterranean voyage.—Ever yours very faithfully,

T. H. HUXLEY.

A birthday letter to his son concludes the year :

4 MARLBOROUGH PLACE, N. W., *Dec. 10, 1878.*

Your mother reminds me that to-morrow is your eighteenth birthday, and though I know that my "happy returns" will reach you a few hours too late I cannot but send them.

You are touching manhood now, my dear laddie, and I trust that as a man your mother and I may always find reason to regard you as we have done throughout your boyhood.

The great thing in the world is not so much to seek happiness as to earn peace and self-respect. I have not troubled you much with paternal didactics—but that bit is "over true" and worth thinking over.

END OF VOL. I













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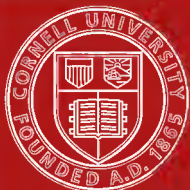
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Life and letters of Thomas Henry Huxley



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LIFE AND LETTERS OF  
THOMAS HENRY HUXLEY







From John Buller, 1852.

Juan, Electric Engraving Co.





Portrait after the Painting by the Hon. John Collier  
in the National Portrait Gallery, 1883.

*Frontispiece.*

LIFE AND LETTERS  
OF  
THOMAS HENRY HUXLEY

BY HIS SON  
LEONARD HUXLEY

*IN TWO VOLUMES*

VOL. II



NEW YORK  
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1900

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## CHAPTER I

1879

MUCH of the work noted down for 1878 reappears in my father's list for 1879. He was still at work upon, or meditating his Crayfish, his Introduction to Psychology, the Spirula Memoir, and a new edition of the Elementary Physiology. Professor H. N. Martin writes about the changes necessary for adapting the "Practical Biology" to American needs; the article on Harvey was waiting to be put into permanent form. Besides giving an address at the Working Men's College, he lectured on Sensation and the Uniformity of the Sensiferous Organs (*Coll. Ess.* vi.), at the Royal Institution, Friday evening, March 7; and on Snakes, both at the Zoological Gardens, June 5, and at the London Institution, December 1. On February 3 he read a paper at the Royal Society on "The Characters of the Pelvis in the Mammalia, and the Conclusions respecting the Origin of Mammals which may be based on them"; and published in *Nature* for November 6 a paper on "Certain Errors Respecting the Structure of the Heart, attributed to Aristotle."

Great interest attaches to this paper. He had always wondered how Aristotle, in dissecting a heart, had come to assert that it contained only three chambers; and the desire to see for himself what stood in the original, uncommented on by translators who were not themselves anatomists, was one of the chief reasons (I think the wish to read the Greek Testament in the original was another) which operated in making him take up the study of Greek late in middle life. His practice was to read in his book until he had come to ten new words; these he looked out, parsed, and wrote

down together with their chief derivatives. This was his daily portion.

When at last he grappled with the passage in question, he found that Aristotle had correctly described what he saw under the special conditions of his dissection, when the right auricle actually appears as he described it, an enlargement of the "great vein." So that this, at least, ought to be removed from the list of Aristotle's errors. The same is shown to be the case with his statements about respiration. His own estimate of Aristotle as a physiologist is between the panegyric of Cuvier and the depreciation of Lewes, "he carried science a step beyond the point at which he found it; a meritorious, but not a miraculous, achievement." And it will interest scholars to know that from his own experience as a lecturer, Huxley was inclined to favour the theory that the original manuscripts of the *Historia Animalium*, with their mingled accuracy and absurdity, were notes taken by some of his students. This essay was reprinted in *Science and Culture*, p. 180.

This year he brought out his second volume of essays on various subjects, written from 1870 to 1878, under the title of *Critiques and Addresses*, and later in the year, his long-delayed and now entirely recast *Introductory Primer* in the Science Primer Series.

6 BARNEPARK TERRACE, TEIGNMOUTH,  
Sept. 12, 1879.

MY DEAR ROSCOE—I send you by this post my long-promised Primer, and a like set of sheets goes to Stewart.\*

You will see that it is quite different from my first sketch, Geikie's primer having cut me out of that line—but I think it much better.

You will see that the idea is to develop Science out of common observation, and to lead up to Physics, Chemistry, Biology, and Psychology.

I want the thing to be good as far as it goes, so don't spare criticism.—Ever yours very faithfully, T. H. HUXLEY.

Best remembrances from us all, which we are jolly.

---

\* Balfour Stewart, Professor of Natural Philosophy in Owens College, Manchester.

To his other duties he now added that of a Governor of Eton College, a post which he held till 1888, when, after doing what he could to advance progressive ideas of education, and in particular, getting a scheme adopted for making drawing part of the regular curriculum, ill-health compelled him to resign.

As for other pressure of work (he writes to Dr. Dohrn, February 16), with the exception of the Zoological Society, I never have anything to do with the affairs of any society but the Royal now—I find the latter takes up all my disposable time. . . . Take comfort from me. I find 53 to be a very youthful period of existence. I have been better physically, and worked harder mentally, this last twelvemonth than in any year of my life. So a mere boy, not yet 40 like you, may look to the future hopefully.

From about this time dates the inception of a short-lived society, to be called the Association of Liberal Thinkers. It had first taken shape in the course of a conversation at Prof. W. K. Clifford's house; the chief promoter and organiser being a well-known Theistic preacher, while on the council were men of science, critics, and scholars in various branches of learning. Huxley was chosen President, and the first meeting of officers and council took place at his house on January 25.

Professor G. J. Romanes was asked to join, but refused on the ground that even if the negations which he supposed the society would promulgate, were true, it was not expedient to offer them to the multitude. To this Huxley wrote the following reply (January 2, 1879):—

Many thanks for your letter. I think it is desirable to explain that our Society is by no means intended to constitute a propaganda of negations, but rather to serve as a centre of free thought.

Of course I have not a word to say in respect of your decision. I quite appreciate your view of the matter, though it is diametrically opposed to my own conviction that the more rapidly truth is spread among mankind the better it will be for them.

Only let us be sure that it is truth.

However, a course of action was proposed which by no means commended itself to several members of the council. Tyndall begs Huxley "not to commit us to a venture of the kind unless you see clearly that it meets a public need, and that it will be worked by able men," and on February 6 the latter writes—

After careful consideration of the whole circumstances of the case, I have definitely arrived at the conclusion that it is not expedient to go on with the undertaking.

I therefore resign my Presidency, and I will ask you to be so good as to intimate my withdrawal from the association to my colleagues.

In spite of having long ago "burned his ships" with regard to both the great Universities, Huxley was agreeably surprised by a new sign of the times from Cambridge. The University now followed up its recognition of Darwin two years before, by offering Huxley an honorary degree, an event of which he wrote to Professor Baynes on June 9:—

I shall be glorious in a red gown at Cambridge to-morrow, and hereafter look to be treated as a PERSON OF RESPECTABILITY.

I have done my best to avoid that misfortune, but it's of no use.

A curious coincidence occurred here. Mr. Sandys, the public orator,\* in his speech presenting him for the degree, picked out one of his characteristics for description in the

---

\* The speech delivered by the public orator on this occasion (June 10, 1879) ran as follows:—*Academi inter silvas qui verum quaerunt, non modo ipsi veritatis lumine vitam hanc umbratilem illustrare conantur, sed illustrissimum quemque veritatis investigatorem aliunde delatum ea qua par est comitate excipiunt. Adest vir cui in veritate exploranda ampla sane provincia contigit, qui sive in animantium sive in arborum et herbarum genere quicquid vivit investigat, ipsum illud vivere quid sit, quali ex origine natum sit; qui exquirat quae cognationis necessitudo inter priores illas viventium species et has quae etiam nunc supersunt, intercedat. Olim in Oceano Australi, ubi rectis "oculis monstra natantia" vidit, victoriam prope primam, velut alter Perseus, a Medusa reportavit; varias deinceps animantium formas quasi ab ipsa Gorgone in saxum versas sagacitate singulari explicavit; vitae denique universae explorandae vitam suam totam dedicavit. Physicorum inter principes diu honoratus, idem (ut verbum*

Horatian phrase, "Propositi tenax." Now this was the family motto; and Huxley wrote to point out the coincidence:—

SCIENCE AND ART DEPARTMENT,  
SOUTH KENSINGTON, *June 11, 1879.*

MY DEAR MR. SANDYS—I beg your acceptance of the inclosed photograph, which is certainly the best ever executed of me.

And by way of a memento of the claim which you established not only to the eloquence but also the insight of a prophet, I have added an impression of the seal with "Tenax propositi" writ plain, if not large. As I mentioned to you, it belonged to my eldest brother, who has been dead for many years. I trust that the Heralds' College may be as well satisfied as he was about his right to the coat of arms and crest.

My own genealogical inquiries have taken me so far back that I confess the later stages do not interest me.—Ever yours very faithfully,

T. H. HUXLEY.

The British Association met at Sheffield in 1879, and Huxley took this occasion to "eat the leek" in the matter of *Bathybius* (see vol. i. p. 318). It must be remembered that his original interpretation of the phenomenon did not involve any new theory of the origin of life, and was not put forward because of its supposed harmony with Darwin's speculations.\*

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mutuemur a Cartesio illo cujus laudes ipse in hac urbe quondam praedicavit) etiam "metaphysica" honore debito prosecutus est. Illum demum liberaliter educatum esse existimat qui cum ceteris animi et corporis dotibus instructus sit, tum praesertim quicquid turpe sit oderit, quicquid sive in arte sive in rerum natura pulchrum sit diligat; neque tamen ipse (ut ait Aristoteles) "animalium parum pulchrorum contemplationem fastidio puerili reformidat"; sed in perpetua animantium serie hominis vestigia perscrutari conatus, satis ampla liberalitate in universa rerum natura "humani nihil a se alienum putat." Duco ad vos virum intrepidum, facundum, propositi tenacem, Thomam Henricum Huxley.

\* "That which interested me in the matter was the apparent analogy of *Bathybius* with other well-known forms of lower life, such as the plasmodia of the Myxomycetes and the Rhizopods. Speculative hopes or fears had nothing to do with the matter; and if *Bathybius* were brought up alive from the bottom of the Atlantic to-morrow, the fact would not have the slightest bearing, that I can discern, upon Mr. Darwin's speculations, or upon any of the disputed problems of

In supporting a vote of thanks to Dr. Allman, the President, for his address, he said (see *Nature*, Aug. 28, 1879):—

I will ask you to allow me to say one word rather upon my own account, in order to prevent a misconception which, I think, might arise, and which I should regret if it did arise. I daresay that no one in this room, who has attained middle life, has been so fortunate as to reach that age without being obliged, now and then, to look back upon some acquaintance, or, it may be, intimate ally of his youth, who has not quite verified the promises of that youth. Nay, let us suppose he has done quite the reverse, and has become a very questionable sort of character, and a person whose acquaintance does not seem quite so desirable as it was in those young days; his way and yours have separated; you have not heard much about him; but eminently trustworthy persons have assured you he has done this, that, or the other; and is more or less of a black sheep, in fact. The President, in an early part of his address, alluded to a certain thing—I hardly know whether I ought to call it a thing or not—of which he gave you the name Bathybius, and he stated, with perfect justice, that I had brought that thing into notice; at any rate, indeed, I christened it, and I am, in a certain sense, its earliest friend. For some time after that interesting Bathybius was launched into the world, a number of admirable persons took the little thing by the hand, and made very much of it, and as the President was good enough to tell you, I am glad to be able to repeat and verify all the statements, as a matter of fact, which I had ventured to make about it. And so things went on, and I thought my young friend Bathybius would turn out a credit to me. But I am sorry to say, as time has gone on, he has not altogether verified the promise of his youth.

In the first place, as the President told you, he could not be found when he was wanted; and in the second place, when he was found, all sorts of things were said about him. Indeed, I regret to be obliged to tell you that some persons of severe minds went so far as to say that he was nothing but simply a gelatinous precipitate of slime, which had carried down organic matter. If that is so, I am very sorry for it, for whoever may have joined in this error, I am undoubtedly primarily responsible for it. But I do not know at the present time of my own knowledge how the matter stands. Nothing would please me more

---

biology. It would merely be one elementary organism the more added to the thousands already known." (*Coll. Ess.* v. 154.)

than to investigate the matter afresh in the way it ought to be investigated, but that would require a voyage of some time, and the investigation of this thing in its native haunts is a kind of work for which, for many years past, I have had no opportunity, and which I do not think I am very likely to enjoy again. Therefore my own judgment is in an absolute state of suspension about it. I can only assure you what has been said about this friend of mine, but I cannot say whether what is said is justified or not. But I feel very happy about the matter. There is one thing about us men of science, and that is, no one who has the greatest prejudice against science can venture to say that we ever endeavour to conceal each other's mistakes. And, therefore, I rest in the most entire and complete confidence that if this should happen to be a blunder of mine, some day or other it will be carefully exposed by somebody. But pray let me remind you whether all this story about Bathybius be right or wrong, makes not the slightest difference to the general argument of the remarkable address put before you to-night. All the statements your President has made are just as true, as profoundly true, as if this little eccentric Bathybius did not exist at all.

Several letters of miscellaneous interest may be quoted.

The following acknowledges the receipt of *Essays in Romance*:—

4 MARLBOROUGH PLACE, LONDON, N.W.,  
January 1879.

MY DEAR SKELTON—Being the most procrastinating letter-writer in existence, I thought, or pretended to think, when I received your *Essays in Romance* that it would not be decent to thank you until I had read the book. And when I had done myself that pleasure, I further pretended to think that it would be much better to wait till I could send you my Hume book, which, as it contains a biography, is the nearest approach to a work of fiction of which I have yet been guilty.

The "Hume" was sent, and I hope reached you a week ago, and as my conscience just now inquired in a very sneering and unpleasant tone whether I had any further pretence for not writing on hand, I thought I might as well stop her mouth at once.

You will see oddly enough that I have answered your question about dreams in a sort of way on page 96.\*

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\* Cp. *Essays in Romance*, p. 329; Huxley's *Hume*, p. 96.

You will get nothing but praise for your book, and I shall be vilipended for mine. Is that fact, or is it not an evidence of a special Providence and Divine Government?

Pray remember me very kindly to Mrs. Skelton. I hope your interrupted visit will yet become a fact. We have a clean bill of health now.—Ever yours very faithfully,

T. H. HUXLEY.

SCOTTISH UNIVERSITY COMMISSION,  
31 QUEEN STREET, EDINBURGH, *April 2, 1879.*

MY DEAR SKELTON—I shall be delighted to dine with you on Wednesday, and take part in any discussion either moral or immoral that may be started.—Ever yours very faithfully,

T. H. HUXLEY.

*March 15, 1879.*

MY DEAR MRS. TYNDALL—Your hearty letter is as good as a bottle of the best sunshine. Yes, I will lunch with you on Friday with pleasure, and Jess proposes to attend on the occasion. . . . Her husband is in Gloucester, and so doesn't count. The absurd creature declares she must go back to him on Saturday—stuff and sentiment. She has only been here six or seven weeks. There is nothing said in Scripture about a wife cleaving to her husband!—With all our loves, ever yours very sincerely,

T. H. HUXLEY.

The next is to his son, then at St. Andrews University, on winning a scholarship tenable at Oxford.

SOUTH KENSINGTON, *April 21, 1879.*

MY DEAR BOY—I was very glad to get your good news this morning, and I need not tell you whether M—— was pleased or not.

But the light of nature doth not inform us of the value and duration of the "Guthrie"—and from a low and material point of view I should like to be informed on that subject. However, this is "mere matter of detail" as the Irishman said when he was asked *how* he had killed his landlord. The pleasure to us is that you have made good use of your opportunities, and finished this first stage of your journey so creditably.

I am about to write to the Master of Balliol for advice as to your future proceedings. In the meanwhile, go in for the enjoyment of your holiday with a light heart. You have earned it.—Ever your loving father,

T. H. HUXLEY.



The following, to Mrs. Clifford, was called forth by a hitch in respect to the grant to her of a Civil List pension after the death of her husband:—

4 MARLBOROUGH PLACE, *July 19, 1879.*

MY DEAR LUCY—I am just off to Gloucester to fetch M— back, and I shall have a long talk with that sage little woman over your letter.

In the meanwhile keep quiet and do nothing. I feel the force of what you say very strongly—so strongly, in fact, that I must morally ice myself and get my judgment clear and cool before I advise you what is to be done.

I am very sorry to hear you have been so ill. For the present dismiss the matter from your thoughts and give your mind to getting better. Leave it all to be turned over in the mind of that cold-blooded, worldly, cynical old fellow, who signs himself—Your affectionate  
PATER.

The last is to Mr. Edward Clodd, on receiving his book *Jesus of Nazareth*.

4 MARLBOROUGH PLACE, ABBEY ROAD, N.W.,  
*Dec. 21, 1879.*

MY DEAR MR. CLODD—I have been spending all this Sunday afternoon over the book you have been kind enough to send me, and being a swift reader, I have travelled honestly from cover to cover.

It is the book I have been longing to see; in spirit, matter and form it appears to me to be exactly what people like myself have been wanting. For though for the last quarter of a century I have done all that lay in my power to oppose and destroy the idolatrous accretions of Judaism and Christianity, I have never had the slightest sympathy with those who, as the Germans say, would “throw the child away along with the bath”—and when I was a member of the London School Board I fought for the retention of the Bible, to the great scandal of some of my Liberal friends—who can't make out to this day whether I was a hypocrite, or simply a fool on that occasion.

But my meaning was that the mass of the people should not be deprived of the one great literature which is open to them—not shut out from the perception of their relations with the whole past history of civilised mankind—not excluded from such a view of Judaism and Jesus of Nazareth as that which at last you have given us.

I cannot doubt that your work will have a great success not only in the grosser, but the better sense of the word.—I am yours very faithfully,  
T. H. HUXLEY.

The winter of 1879–80 was memorable for its prolonged spell of cold weather. One result of this may be traced in a New Year's letter from Huxley to his eldest daughter. "I have had a capital holiday—mostly in bed—but I don't feel so grateful for it as I might do." To be forced to avoid the many interruptions and distractions of his life in London, which claimed the greater part of his time, he would regard as an unmixed blessing; as he once said feelingly to Professor Marsh, "If I could only break my leg, what a lot of scientific work I could do!" But he was less grateful for having entire inaction forced upon him.

However, he was soon about again, and wrote as follows in answer to a letter from Sir Thomas (afterwards Lord) Farrer, which called his attention, as an old Fishery Commissioner, to a recent report on the sea-fisheries.

4 MARLBOROUGH PLACE, *Jan. 9, 1880.*

MY DEAR FARRER—I shall be delighted to take a dive into the unfathomable depths of official folly; but your promised document has not reached me.

Your astonishment at the tenacity of life of fallacies, permit me to say, is shockingly unphysiological. They, like other low organisms, are independent of brains, and only wriggle the more, the more they are smitten on the place where the brains ought to be—I don't know B., but I am convinced that A. has nothing but a spinal cord, devoid of any cerebral development. Would Mr. Cross give him up for purposes of experiment? Lingen and you might perhaps be got to join in a memorial to that effect.—Ever yours very faithfully,  
T. H. HUXLEY.

A fresh chapter of research, the results of which he now began to give to the public, was the history of the Dog. On April 6 and 13 he lectured at the Royal Institution "On Dogs and the Problems connected with them"—their relation to other animals, and the problem of the origin of the domestic dog, and the dog-like animals in general. As so often before, these lectures were the outcome of the care-

ful preparation of a course of instruction for his students. The dog had been selected as one of the types of mammalian structure upon which laboratory work was to be done. Huxley's own dissections had led him on to a complete survey of the genus, both wild and domestic. As he writes to Darwin on May 10:—

I wish it were not such a long story that I could tell you all about the dogs. They will make out such a case for "Darwinism" as never was. From the South American dogs at the bottom (*C. vetulus*, *cancrivorus*, etc.) to the wolves at the top, there is a regular gradual progression, the range of variation of each "species" overlapping the ranges of those below and above. Moreover, as to the domestic dogs, I think I can prove that the small dogs are modified jackals, and the big dogs ditto wolves. I have been getting capital material from India, and working the whole affair out on the basis of measurements of skulls and teeth.

However, my paper for the Zoological Society is finished, and I hope soon to send you a copy of it. . . .

Unfortunately he never found time to complete his work for final publication in book form, and the rough, unfinished notes are all that remain of his work, beyond two monographs "On the Epipubis in the Dog and Fox" (*Proc. Roy. Soc.* xxx. 162-63), and "On the Cranial and Dental Characters of the Canidae" (*Proc. Zool. Soc.* 1880, pp. 238-288).

The following letters deal with the collection of specimens for examination:—

4 MARLBOROUGH PLACE, Jan. 17, 1880.

MY DEAR FLOWER—I happened to get hold of two foxes this week—a fine dog fox and his vixen wife; and among other things, I have been looking up Cowper's glands, the supposed absence of which in the dogs has always "gone agin' me." Moreover, I have found them (or their representatives) in the shape of two small sacs, which open by conspicuous apertures into the urethra immediately behind the bulb. If your *Icticyon* was a male, I commend this point to your notice.

*Item.*—If you have not already begun to macerate him, do look for the "marsupial" fibro-cartilages, which I have mentioned in my "Manual," but the existence of which blasphemers

have denied. I found them again at once in both Mr. and Mrs. Vulpes. You spot them immediately by the *pectineus* which is attached to them.

The dog-fox's cæcum is so different from the vixen's that Gray would have made distinct genera of them.—Ever yours very faithfully,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., May 2, 1880.

MY DEAR FAYRER—I am greatly obliged for the skulls, and I hope you will offer my best thanks to your son for the trouble he has taken in getting them.

The "fox" is especially interesting because it is not a fox, by any manner of means, but a big jackal with some interesting points of approximation towards the cuons.

I do not see any locality given along with the specimens. Can you supply it?

I have got together some very curious evidence of the wider range of variability of the Indian jackal, and the "fox" which your son has sent is the most extreme form in one direction I have met with.

I wish I could get some examples from the Bombay and Madras Presidencies and from Ceylon, as well as from Central India. Almost all I have seen yet are from Bengal.—Ever yours very faithfully,

T. H. HUXLEY.

Between the two lectures on the Dog, mentioned above, on April 9, Huxley delivered a Friday evening discourse, at the same place, "On the Coming of Age of the Origin of Species" (*Coll. Ess.* ii. 227). Reviewing the history of the theory of evolution in the twenty-one years that had elapsed since the *Origin of Species* first saw the light in 1859, he did not merely dwell on the immense influence the "Origin" had exercised upon every field of biological inquiry. "Mere insanities and inanities have before now swollen to portentous size in the course of twenty years." "History warns us that it is the customary fate of new truths to begin as heresies, and to end as superstitions." There was actual danger lest a new generation should "accept the main doctrines of the *Origin of Species* with as little reflection, and it may be with as little justification, as so many of our contemporaries, years ago, rejected them."

So dire a consummation, he declared, must be prevented by unflinching criticism, the essence of the scientific spirit, "for the scientific spirit is of more value than its products, and irrationally held truths may be more harmful than reasoned errors."

What, then, were the facts which justified so great a change as had taken place, which had removed some of the most important qualifications under which he himself had accepted the theory? He proceeded to enumerate the "crushing accumulation of evidence" during this period, which had proved the imperfection of the geological record; had filled up enormous gaps, such as those between birds and reptiles, vertebrates and invertebrates, flowering and flowerless plants, or the lowest forms of animal and plant life. More: paleontology alone has effected so much—the fact that evolution has taken place is so irresistibly forced upon the mind by the study of the Tertiary mammalia brought to light since 1859, that "if the doctrine of evolution had not existed, paleontologists must have invented it." He further developed the subject by reading before the Zoological Society a paper "On the Application of the Laws of Evolution to the Arrangement of the Vertebrata, and more particularly of the Mammalia" (*Proc. Z. S.* 1880, pp. 649–662). In reply to Darwin's letter thanking him for the "Coming of Age" (*Life and Letters*, iii. 24), he wrote on May 10:—

MY DEAR DARWIN—You are the cheeriest letter-writer I know, and always help a man to think the best of his doings.

I hope you do not imagine because I had nothing to say about "Natural Selection," that I am at all weak of faith on that article. On the contrary, I live in hope that as palæontologists work more and more in the manner of that "second Daniel come to judgment," that wise young man M. Filhal, we shall arrive at a crushing accumulation of evidence in that direction also. But the first thing seems to me to be to drive the fact of evolution into people's heads; when that is once safe, the rest will come easy.

I hear that *ce cher* X. is yelping about again; but in spite of your provocative messages (which Rachel retailed with great glee), I am not going to attack him nor anybody else.

Another popular lecture on a zoological subject was that of July 1 on "Cuttlefish and Squids," the last of the "Davis" lectures given by him at the Zoological Gardens.

More important were two other essays delivered this year. The "Method of Zadig" (*Coll. Ess.* iv. 1), an address at the Working Men's College, takes for its text Voltaire's story of the philosopher at the Oriental court, who, by taking note of trivial indications, obtains a perilous knowledge of things, which his neighbours ascribe either to thievery or magic. This introduces a discourse on the identity of the methods of science and of the judgments of common life, a fact which, twenty-six years before, he had briefly stated in the words, "Science is nothing but trained and organised common sense" (*Coll. Ess.* iii. 45).

The other is "Science and Culture" (*Coll. Ess.* iii. 134), which was delivered on October 1, as the opening address of the Josiah Mason College at Birmingham, and gave its name to a volume of essays published in the following year. Here was a great school founded by a successful ironworker, which was designed to give an education at once practical and liberal, such as the experience of its founder approved, to young men who meant to embark upon practical life. A "mere" literary training—*i.e.* in the classical languages—was excluded, but not so the study of English literature and modern languages. The greatest stress was laid on training in the scientific theory and practice on which depend the future of the great manufactures of the north.

The question dealt with in this address is whether such an education can give the culture demanded of an educated man to-day. The answer is emphatically Yes. English literature is a field of culture second to none, and for solely literary purposes, a thorough knowledge of it, backed by some other modern language, will amply suffice. Combined with this, a knowledge of modern science, its principles and results, which have so profoundly modified society and have created modern civilisation, will give a "criticism of life," as Matthew Arnold defined culture, unattainable by any form of education which neglects it. In short, although the "culture" of former periods might be purely literary, that

of to-day must be based, to a great extent, upon natural science.

This autumn several letters passed between him and Darwin. The latter, contrary to his usual custom, wrote a letter to *Nature*, in reply to an unfair attack which had been made upon evolution by Sir Wyville Thomson in his Introduction to *The Voyage of the Challenger* (see Darwin, *Life and Letters*, iii. 242), and asked Huxley to look over the concluding sentences of the letter, and to decide whether they should go with the rest to the printer or not. "My request," he writes (Nov. 5), "will not cost you much trouble—*i.e.* to read two pages—for I know that you can decide at once." Huxley struck them out, replying on the 14th, "Your pinned-on paragraph was so good that, if I had written it myself, I should have been unable to refrain from sending it on to the printer. But it is much easier to be virtuous on other people's account; and though Thomson deserved it and more, I thought it would be better to refrain. If I say a savage thing, it is only 'pretty Fanny's way'; but if you do, it is not likely to be forgotten."

The rest of this correspondence has to do with a plan of Darwin's, generous as ever, to obtain a Civil List pension for the veteran naturalist, Wallace, whose magnificent work for science had brought him but little material return. He wrote to consult Huxley as to what steps had best be taken; the latter replied in the letter of November 14:—

The papers *in re* Wallace have arrived, and I lose no time in assuring you that all my "might, amity, and authority," as Essex said when that sneak Bacon asked him for a favour, shall be exercised as you wish.

On December 11 he sends Darwin the draft of a memorial on the subject, and on the 28th suggests that the best way of moving the official world would be for Darwin himself to send the memorial, with a note of his own, to Mr. Gladstone, who was then Prime Minister and First Lord of the Treasury:—

Mr. G. can do a thing gracefully when he is so minded, and unless I greatly mistake, he will be so minded if you write to him.

The result was all that could be hoped. On January 7 Darwin writes:—“Hurrah! hurrah! read the enclosed. Was it not extraordinarily kind of Mr. Gladstone to write himself at the present time? . . . I have written to Wallace. He owes much to you. Had it not been for your advice and assistance, I should never have had courage to go on.”

The rest of the letter to Darwin of Dec. 28 is characteristic of his own view of life. He was no pessimist any more than he was a professed optimist. If the vast amount of inevitable suffering precluded the one view, the gratuitous pleasures, so to speak, of life, preclude the other. Life properly lived is worth living, and would be even if a malevolent fate had decreed that one should suffer, say, the pangs of toothache two hours out of every twenty-four. So he writes:—

We have had all the chicks (and the husbands of such as are therewith provided) round the Christmas table once more, and a pleasant sight they were, though I say it that shouldn't. Only the grand-daughter left out, the young woman not having reached the age when change and society are valuable.

I don't know what you think about anniversaries. I like them, being always minded to drink my cup of life to the bottom, and take my chance of the sweets and bitters. Infinite benevolence need not have invented pain and sorrow at all—infinite malevolence would very easily have deprived us of the large measure of content and happiness that falls to our lot. After all, Butler's *Analogy* is unassailable, and there is nothing in theological dogmas more contradictory to our moral sense, than is to be found in the facts of Nature. From which, however, the Bishop's conclusion that the dogmas are true doesn't follow.

The following is to his Edinburgh friend Dr. Skelton, whose appreciation of his frequent companionship had found outspoken expression in the pages of *The Crookit Meg*.

4 MARLBOROUGH PLACE, N.W., Nov. 14, 1880.

MY DEAR SKELTON—When the *Crooked Meg* reached me I made up my mind that it would be a shame to send the empty acknowledgment which I give (or don't give) for most books that reach me.

But I am over head and ears in work—time utterly wasted



in mere knowledge getting and giving—and for six weeks not an hour for real edification with a wholesome story.

But this Sunday afternoon being, by the blessing of God, as beastly a November day as you shall see, I have attended to my spiritual side and been visited by a blessing in the shape of some very pretty and unexpected words anent mysel'.\*

In truth, it is a right excellent story, though, distinctly in love with Eppie, I can only wonder how you had the heart to treat her so ill. A girl like that should have had two husbands—one “wisely ranged for show” and t’other *de par amours*.

Don’t ruin me with Mrs. Skelton by repeating this, but please remember me very kindly to her.—Ever yours very faithfully,  
T. H. HUXLEY.

The following letter to Tyndall was called forth by an incident in connection with the starting of the *Nineteenth Century*. Huxley had promised to help the editor by looking over the proofs of a monthly article on contemporary science. But his advertised position as merely adviser in this to the editor was overlooked by some who resented what they supposed to be his assumption of the rôle of critic in general to his fellow-workers in science. At a meeting of the *r* Club, Tyndall made a jesting allusion to this; Huxley, however, thought the mere suggestion too grave for a joke, and replied with all seriousness to clear himself from the possibility of such misconception. And the same evening he wrote to Tyndall:—

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\* The passage referred to stands on p. 72 of *The Crookit Meg*, and describes the village naturalist and philosopher, Adam Meldrum, “who in his working hours cobbled old boats, and knew by heart the plays of Shakespeare and the *Pseudodoxia Epidemica* of Sir Thomas Browne.”

“For the rest it will be enough to add that this long, gaunt, bony cobbler of old boats was—was—(may I take the liberty, Mr. Professor?) a village Huxley of the year One. The colourless brilliancy of the great teacher’s style, the easy facility with which the drop of light forms itself into a perfect sphere as it falls from his pen, belong indeed to a consummate master of the art of expression, which Adam of course was not; but the mental lucidity, justice, and balance, as well as the reserve of power, and the Shakespearian gaiety of touch, which made the old man one of the most delightful companions in the world, were essentially Huxleian.”

ATHENÆUM CLUB, PALL MALL, S.W.,  
Dec. 2, 1880.

MY DEAR TYNDALL—I must tell you the ins and outs of this *Nineteenth Century* business. I was anxious to help Knowles when he started the journal, and at his earnest and pressing request I agreed to do what I have done. But being quite aware of the misinterpretation to which I should be liable if my name "sans phrase" were attached to the article, I insisted upon the exact words which you will find at the head of it; and which seemed, and still seem to me, to define my position as a mere adviser of the editor.

Moreover, by diligently excluding any expression of opinion on the part of the writers of the compilation, I thought that nobody could possibly suspect me of assuming the position of an authority even on the subjects with which I may be supposed to be acquainted, let alone those such as physics and chemistry, of which I know no more than anyone of the public may know.

Therefore your remarks came upon me to-night with the sort of painful surprise which a man feels who is accused of the particular sin of which he flatters himself he is especially not guilty, and "roused my corruption" as the Scotch have it. But there is no need to say anything about that, for you were generous and good as I have always found you. Only I pray you, if hereafter it strikes you that any doing of mine should be altered or amended, tell me yourself and privately, and I promise you a very patient listener, and what is more a very thankful one.—Ever yours,  
T. H. HUXLEY.

Tyndall replied with no less frankness, thanking him for the friendly promptitude of his letter, and explaining that he had meant to speak privately on the matter, but had been forestalled by the subject coming up when it did. And he wound up by declaring that it would be too absurd to admit the power of such an occasion "to put even a momentary strain upon the cable which has held us together for nine and twenty years."

At the very end of the year, George Eliot died. A proposal was immediately set on foot to inter her remains in Westminster Abbey, and various men of letters pressed the matter on the Dean, who was unwilling to stir without a very strong and general expression of opinion. To Mr.



*Engraved by O. Lacour.*

T. H. HUXLEY.



Herbert Spencer, who had urged him to join in memorialising the Dean, Huxley replied as follows:—

4 MARLBOROUGH PLACE, *Dec. 27, 1880.*

MY DEAR SPENCER—Your telegram which reached me on Friday evening caused me great perplexity, inasmuch as I had just been talking with Morley, and agreeing with him that the proposal for a funeral in Westminster Abbey had a very questionable look to us, who desired nothing so much as that peace and honour should attend George Eliot to her grave.

It can hardly be doubted that the proposal will be bitterly opposed, possibly (as happened in Mill's case with less provocation), with the raking up of past histories, about which the opinion even of those who have least the desire or the right to be pharisaical is strongly divided, and which had better be forgotten.

With respect to putting pressure on the Dean of Westminster, I have to consider that he has some confidence in me, and before asking him to do something for which he is pretty sure to be violently assailed, I have to ask myself whether I really think it a right thing for a man in his position to do.

Now I cannot say I do. However much I may lament the circumstance, Westminster Abbey is a Christian Church and not a Pantheon, and the Dean thereof is officially a Christian priest, and we ask him to bestow exceptional Christian honours by this burial in the Abbey. George Eliot is known not only as a great writer, but as a person whose life and opinions were in notorious antagonism to Christian practice in regard to marriage, and Christian theory in regard to dogma. How am I to tell the Dean that I think he ought to read over the body of a person who did not repent of what the Church considers mortal sin, a service not one solitary proposition in which she would have accepted for truth while she was alive? How am I to urge him to do that which, if I were in his place, I should most emphatically refuse to do?

You tell me that Mrs. Cross wished for the funeral in the Abbey. While I desire to entertain the greatest respect for her wishes, I am very sorry to hear it. I do not understand the feeling which could create such a desire on any personal grounds, save those of affection, and the natural yearning to be near even in death to those whom we have loved. And on public grounds the wish is still less intelligible to me. One cannot eat one's cake and have it too. Those who elect to be

free in thought and deed must not hanker after the rewards, if they are to be so called, which the world offers to those who put up with its fetters.

Thus, however I look at the proposal it seems to me to be a profound mistake, and I can have nothing to do with it.

I shall be deeply grieved if this resolution is ascribed to any other motives than those which I have set forth at more length than I intended.—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER II

1881

THE last ten years had found Huxley gradually involved more and more in official duties. Now, with the beginning of 1881, he became yet more deeply engrossed in practical and administrative work, more completely cut off from his favourite investigations, by his appointment to an Inspectorship of Fisheries, in succession to the late Frank Buckland. It is almost pathetic to note how he snatched at any spare moments for biological research. No sooner was a long afternoon's work at the Home Office done, than, as Professor Howes relates, he would often take a hansom to the laboratory at South Kensington, and spend a last half-hour at his dissections before going home.

The Inspectorship, which was worth £700 a year, he held in addition to his post at South Kensington, the official description of which now underwent another change. In the first place, his official connection with the Survey appears to have ceased this year, the last report made by him being in 1881. His name, however, still appeared in connection with the post of Naturalist until his retirement in 1885, and it was understood that his services continued to be available if required. Next, in October of this year, the Royal School of Mines was incorporated with the newly established Normal School—or as it was called in 1890, Royal College of Science, and the title of Lecturer on General Natural History was suppressed, and Huxley became Professor of Biology and Dean of the College at a salary of £800, for it was arranged on his appointment to the Inspectorship, that he should not receive the salary attached to the post of Dean. Thus the Treasury saved £200 a year.

As Professor of Biology, he was under the Lord President of the Council; as Inspector of Fisheries, under the Board of Trade; hence some time passed in arranging the claims of the two departments before the appointment was officially made known, as may be gathered from the following letters:—

### TO SIR JOHN DONNELLY .

4 MARLBOROUGH PLACE, *Dec. 27, 1880.*

MY DEAR DONNELLY—I tried hard to have a bad cold last night, and though I blocked him with quinine I think I may as well give myself the benefit of the Bank Holiday and keep the house to-day.

There is a chance of your getting early salmon yet. I wrote to decline the post on Friday, but on Saturday evening the Home Secretary sent a note asking to see me yesterday. As he had re-opened the question of course I felt justified in stating all the pros and cons of the case as personal to myself and my rather complicated official position. . . . He entered into the affair with a warmth and readiness which very agreeably surprised me, and he proposes making such arrangements as will not oblige me to have anything to do with the weirs or the actual inspection. Under these circumstances the post would be lovely—if I can hold it along with the other things. And of his own motion the Home Secretary is going to write to Lord Spencer about it to see if he cannot carry the whole thing through.

If this could be managed I could get great things done in the matter of fish culture and fish diseases at South Kensington, if poor dear X.'s rattle trappery could be turned to proper account, without in any way interfering with the work of the School.

At any rate, my book stands not to lose, and may win—the innocence of the dove is not always divorced from the wisdom of the serpent. [Sketch of the "Serpent."]

### TO LORD FARRER

4 MARLBOROUGH PLACE, *Jan. 18, 1881.*

MY DEAR FARRER—I have waited a day or two before thanking you for your very kind letter, in the hope that I might be able to speak as one knowing where he is.



But as I am still, in an official sense, nowhere, I will not delay any longer.

I had never thought of the post, but the Home Secretary offered it to me in a very kind and considerate manner, and after some hesitation I accepted it. But some adjustment had to be made between my master, the Lord President, and the Treasury; and although everybody seems disposed to be very good to me, the business is not yet finally settled. Whence the newspapers get their information I don't know—but it is always wrong in these matters.

As you know I have had a good apprenticeship to the work\*—and I hope to be of some use; of the few innocent pleasures left to men past middle life—the jamming common-sense down the throats of fools is perhaps the keenest.

May we do some joint business in that way!—Ever yours  
very faithfully,  
T. H. HUXLEY.

#### TO HIS ELDEST SON

*Feb. 14, 1881.*

I have entered upon my new duties as Fishery Inspector, but you are not to expect salmon to be much cheaper just yet.

My colleague and I have rooms at the Home Office, and I find there is more occupation than I expected, but no serious labour.

Every now and then I shall have to spend a few days in the country, holding inquiries, and as salmon rivers are all in picturesque parts of the country, I shall not object to that part of the business.

The duties of the new office were partly scientific, partly administrative. On the one hand, the natural history and diseases of fish had to be investigated; on the other, regulations had to be carried out, weirs and salmon passes approved, disputes settled, reports written. I find for instance, that apart from the work in London, visits of inspection in all parts of the country took up twenty-eight days between March and September this year.

Sir Spencer Walpole, who was his colleague for some years, has kindly given me an account of their work together.

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\* He had already served on two Fishery Commissions, 1862 and 1864-5.

Early in 1881, Sir William Harcourt appointed Professor Huxley one of Her Majesty's Inspectors of Fisheries. The office had become vacant through the untimely death, in the preceding December, of the late Mr. Frank Buckland. Under an Act, passed twenty years before, the charge of the English Salmon Fisheries had been placed under the Home Office, and the Secretary of State had been authorised to appoint two Inspectors to aid him in administering the law. The functions of the Home Office and of the Inspectors were originally simple, but they had been enlarged by an Act passed in 1873, which conferred on local conservators elaborate powers of making bye-laws for the development and preservation of the Fisheries. These bye-laws required the approval of the Secretary of State, who was necessarily dependent on the advice of his Inspectors in either allowing or disallowing them.

In addition to the nominal duties of the Inspectors, they became—by virtue of their position—the advisers of the Government on all questions connected with the Sea Fisheries of Great Britain. These fisheries are nominally under the Board of Trade, but, as this Board at that time had no machinery at its disposal for the purpose, it naturally relied on the advice of the Home Office Inspectors in all questions of difficulty, on which their experience enabled them to speak with authority.

For duties such as these, which have been thus briefly described, Professor Huxley had obvious qualifications. On all subjects relating to the Natural History of Fish he spoke with decisive authority. But, in addition to his scientific attainments, from 1863 to 1865 he had been a member of the Commission which had conducted an elaborate investigation into the condition of the Fisheries of the United Kingdom, and had taken a large share in the preparation of a Report, which—withstanding recent changes in law and policy—remains the ablest and most exhaustive document which has ever been laid before Parliament on the subject.

This protracted investigation had convinced Professor Huxley that the supply of fish in the deep sea was practically inexhaustible; and that, however much it might be necessary to enforce the police of the seas by protecting particular classes of sea fishermen from injury done to their instruments by the operations of other classes, the primary duty of the legislature was to develop sea fishing, and not to place restrictions on sea fishermen for any fears of an exhaustion of fish.

His scientific training, moreover, made him ridicule the

modern notion that it was possible to stock the sea by artificial methods. He wrote to me, when the Fisheries Exhibition of 1883 was in contemplation, "You may have seen that we have a new Fish Culture Society. C—— talked gravely about our stocking the North Sea with cod! After that I suppose we shall take up herrings: and I mean to propose whales, which, as all the world knows, are terribly over fished!" And after the exhibition was over he wrote to me again, with reference to a report which the Commission had asked me to draw up: "I have just finished reading your report, which has given me a world of satisfaction. . . . I am particularly glad that you have put in a word of warning to the fish culturists."\*

He was not, however, equally certain that particular areas of Sea Shore might not be exhausted by our fishing. He extended in 1883 an order which Mr. Buckland and I had made in 1879 for restricting the taking of crabs and lobsters on the coast of Norfolk, and he wrote to me on that occasion: "I was at Cromer and Sheringham last week, holding an enquiry for the Board of Trade about the working of your order of 1879. According to all accounts, the crabs have multiplied threefold in 1881 and 1882. Whether this is *post hoc* or *propter hoc* is more than I should like to say. But at any rate, this is a very good *primâ facie* case for continuing the order, and I shall report accordingly. Anyhow, the conditions are very favourable for a long-continued experiment in the effects of regulation, and, ten years hence, there will be some means of judging of the value of these restrictions."

If, however, Professor Huxley was strongly opposed to unnecessary interference with the labours of sea fishermen, he was well aware of the necessity of protecting migratory fish like salmon, against over-fishing: and his reports for 1882 and 1883—in which he gave elaborate accounts of the results of legislation on the Tyne and on the Severn—show that he keenly appreciated the necessity of regulating the Salmon Fisheries.

It so happened that at the time of his appointment, many of our important rivers were visited by "*Saprolegnia ferax*,"

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\* When I was asked to write the report on this Commission, I said that I would do so if Sir E. Birkbeck, its chairman, and Professor Huxley, both met me to discuss the points to be noticed. The meeting duly took place; and I opened it by asking what was the chief lesson to be drawn from the exhibition? "Well," said Professor Huxley, "the chief lesson to be drawn from the exhibition is that London is in want of some open air amusement on summer evenings."

the fungoid growth which became popularly known as Salmon Disease. Professor Huxley gave much time to the study of the conditions under which the fungus flourished: he devoted much space in his earlier reports to the subject: and he read a paper upon it at a remarkable meeting of the Royal Society in the summer of 1881. He took a keen interest in these investigations, and he wrote to me from North Wales, at the end of 1881, "The salmon brought to me here have not been so badly diseased as I could have wished, and the fungus dies so rapidly out of the water that only one specimen furnished me with materials in lively condition. These I have cultivated: and to my great satisfaction have got some flies infected. With nine precious muscoid corpses, more or less ornamented with a lovely fur trimming of *Saprolegnia*, I shall return to London to-morrow, and shall be ready in a short time, I hope, to furnish Salmon Disease wholesale, retail, or for exportation."

In carrying out the duties of our office, Professor Huxley and I were necessarily thrown into very close communication. There were few days in which we did not pass some time in each other's company: there were many weeks in which we travelled together through the river basins of this country. I think that I am justified in saying that official intercourse ripened into warm personal friendship, and that, for the many months in which we served together, we lived on terms of intimacy which are rare even among colleagues or even among friends.

It is needless to say that, as a companion, Professor Huxley was the most delightful of men. Those who have met him in society, or enjoyed the hospitality of his house, must have been conscious of the singular charm of a conversation, which was founded on knowledge, enlarged by memory, and brightened by humour. But, admirable as he was in society, no one could have realised the full charm of his company who had not conversed with him alone. He had the rare art of placing men, whose knowledge and intellect were inferior to his own, at their ease. He knew how to draw out all that was best in the companion who suited him; and he had equal pleasure in giving and receiving. Our conversation ranged over every subject. We discussed together the grave problems of man and his destiny; we disputed on the minor complications of modern politics; we criticised one another's literary judgments; and we laughed over the stories which we told one another, and of which Professor Huxley had an inexhaustible fund.

In conversation Professor Huxley displayed the quality which distinguished him both as a writer and a public speaker. He invariably used the right words in the right sense. Those who are jointly responsible—as he and I were often jointly responsible—for some written document, have exceptional opportunities of observing this quality. Professor Huxley could always put his finger on a wrong word, and he always instinctively chose the right one. It was this qualification—a much rarer one than people imagine—which made Professor Huxley's essays clear to the meanest understanding, and which made him, in my judgment, the greatest master of prose of his time. The same quality was equally observable in his spoken speech. I happened to be present at the anniversary dinner of the Royal Society, at which Professor Huxley made his last speech. And, as he gave an admirable account of the share which he had taken in defending Mr. Darwin against his critics, I overheard the present Prime Minister\* say, "What a beautiful speaker he is."

In 1882, the duties of another appointment forced me to resign the Inspectorship, which I had held for so long: and thenceforward my residence in the Isle of Man gave me fewer opportunities of seeing Professor Huxley: our friendship, however, remained unbroken; and occasional visits to London gave me many opportunities of renewing it. He retained his own appointment as Inspector for more than three years after my resignation. He served, during the closing months of his officialship, on a Royal Commission on trawling, over which the late Lord Dalhousie presided. But his health broke down before the commissioners issued their report, and he was ordered abroad. It so happened that in the spring of 1885 I was staying at Florence, when Professor and Mrs. Huxley passed through it on their way home. He had at that time seen none of his old friends, and was only slowly regaining strength. After his severe illness Mrs. Huxley encouraged me to take him out for many short walks, and I did my best to cheer him in his depressed condition. He did not then think that he had ten years of—on the whole—happy life before him. He told me that he was about to retire from all his work, and he added, that he had never enjoyed the Inspectorship after I had left it. I am happy in believing that the remark was due to the depression from which he was suffering, for he had written to me two

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\* Lord Salisbury.

years ago, "The office would be quite perfect, if they did not want an annual report. I can't go in for a disquisition on river basins after the manner of Buckland, and you have exhausted the other topics. I polished off the Salmon Disease pretty fully last year, so what the deuce am I to write about?"

I saw Professor Huxley for the last time on the Christmas day before his death. I spent some hours with him, with no other companions than Mrs. Huxley and my daughter. I had never seen him brighter or happier, and his rich, playful and sympathetic talk vividly recalled the many brilliant hours which I had passed in his company some twelve or thirteen years before.

One word more. No one could have known Professor Huxley intimately without recognising that he delighted in combat. He was never happier than when he was engaged in argument or controversy, and he loved to select antagonists worthy of his steel. The first public enquiry which we held together was attended by a great nobleman, whom Professor Huxley did not know by sight, but who rose at the commencement of our proceedings to offer some suggestions. Professor Huxley directed him to sit down, and not interrupt the business. I told my colleague in a whisper whom he was interrupting. And I was amused, as we walked away to luncheon together, by his quaint remark to me, "We have begun very well, we have sat upon a duke." \*

If, however, a love of argument and controversy occasionally led him into hot water, I do not think that his polemical tendencies ever cost him a friend. His antagonists must have recognised the fairness of his methods, and must have been susceptible to the charm of the man. The high example which he set in controversy, moreover, was equally visible in his ordinary life. Of all the men I have ever known, his ideas and his standard were—on the whole—the highest. He recognised that the fact of his religious views imposed on him the duty of living the most upright of lives, and I am very much of the opinion of a little

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\* Of this he wrote home on March 15, 1881: "Somebody produced the *Punch* yesterday and showed it to me, to the great satisfaction of the Duke of —, who has attended our two meetings. I nearly had a shindy with him at starting, but sweetness and light (in my person) carried the day." This *Punch* contained the cartoon of Huxley in nautical costume riding on a salmon; contrary to the custom of *Punch*, it made an unfair hit in appending to his name the letters £ s. d. Never was any one who deserved the imputation less.

child, now grown into an accomplished woman, who, when she was told that Professor Huxley had no hope of future rewards, and no fear of future punishments, emphatically declared: "Then I think Professor Huxley is the best man I have ever known."

Extracts from his letters home give some further idea of the kind of work entailed. Thus in March and again in May he was in Wales, and writes:—

CROMFFYRATELLIONPTRROCH, *May 24.*

Mr. Barrington's very pretty place about five miles from Abergavenny, wherein I write, may or may not have the name which I have written on at the top of the page, as it is Welsh; however it is probably that or something like it. I forgot to enquire.

We are having the loveliest weather, and yesterday went looking up weirs with more or less absurd passes up a charming valley not far hence. It is just seven o'clock, and we are going to breakfast and start at eight to fit in with the tides of the Severn. It is not exactly clear where we shall be to-night. . . . Now I must go to breakfast, for I got up at six. *Figurez vous ça.*

*May 29—Hereford.*—We are favoured by the weather again, though it is bitter cold under the bright sunshine. We stopped at Worcester yesterday, and I went to examine some weirs hard by. This involved three or four miles' country walking, and was all to the good. If the Inspector business were all of this sort it would be all that fancy painted it. We shall have a long sitting to-day. . . . [He fears to be detained into the night by "over-fluent witnesses."]

In April he spent several days at Norwich, in connection with the National Fishery Exhibition held there.

*April 19.*—We had a gala day yesterday. . . . The exhibition of all manner of fish and fishing apparatus was ready, for a wonder, and looked very well. The Prince and Princess arrived, and we had the usual address and reply and march through. Afterwards a mighty *déjeuner* in the St. Andrew's Hall—a fine old place looking its best. I was just opposite the Princess, and I could not help looking at her with wonderment. She looked so fresh and girlish. She came and talked to me afterwards in a very pleasant simple way.

Walpole and I went in with our host yesterday afternoon and started to return on the understanding that he should pick us up a few miles out. Of course we took the wrong road, and walked all the way, some eight miles or so. However, it did us good, and after a champagne lunch we thought we could not do better than repeat the operation yesterday.

I feel quite set up by finding that after standing about for hours I can walk eight miles without any particular fatigue. Life in the old dog yet! Walpole is a capital companion—knows a great many things, and talks well about them, so we get over the ground pleasantly.

*April 20.*—There was a long day of it yesterday looking over things in the Exhibition till late in the afternoon, and then a mighty dinner in St. Andrew's Hall given by a Piscatorial Society of which my host is President. It was a weary sitting of five hours with innumerable speeches. Of course I had to say "a few words," and if I can get a copy of the papers I will send them to you. I flatter myself they were words of wisdom, though hardly likely to contribute to my popularity among the fishermen.

On the 21st he gave an address on the Herring. To describe the characteristics of this fish in the Eastern Counties, he says, might seem like carrying coals to Newcastle; nevertheless the fisherman's knowledge is not the same as that of the man of science, and includes none but the vaguest notions of the ways of life of the fish and the singularities of its organisation which perplexed biologists. His own study of the problems connected with the herring had begun nineteen years before, when he served on the first of his two Fishery Commissions; and one of his chief objects in this address was to insist upon a fact, borne out partly by the inquiries of the Commission, partly by later investigations in Europe and America, which it was difficult to make people appreciate, namely, the impossibility of man's fisheries affecting the numbers of the herring to any appreciable extent, a year's catch not amounting to the estimated number of a single shoal; while the flatfish and cod fisheries remove many of the most destructive enemies of the herring. Those who had not studied the question in this light would say that "it stands to reason" that vast fisheries must tend to exterminate the fish; apropos of which, he made his



well-known remark that in questions of biology "if any one tells me 'it stands to reason' that such and such things must happen, I generally find reason to doubt the safety of his standing."

This year, also, he began the investigations which completed former inquiries into the subject, and finally elucidated the nature of the salmon disease. The last link in the chain of evidence which proved its identity with a fungoid disease of flies, was not reached until March 1883; and on July 3 following he delivered a full account of the disease, its nature and origin, in an address at the Fisheries Exhibition in London.

In 1881, then, at the end of December, he went to North Wales to study on the fresh fish, the nature of the epidemic of salmon disease which had broken out in the Conway, in spite of being in such bad health that he was persuaded to let his younger son come and look after him. But this was only a passing premonition of the breakdown which was to come upon him three years after.

One year's work as Inspector was very like another. In 1882, for instance, on January 21, he is at Berwick, "voiceless but jolly"; in the spring he had to attend a Fisheries Exhibition in Edinburgh, and writes:—

*April 12.*—We have opened our Exhibition, and I have been standing about looking at the contents until my back is broken.

*April 13.*—The weather here is villainous—a regular Edinburgh "coorse day." I have seen all I wanted to see of the Exhibition, eaten two heavy dinners, one with Primrose and one with Young, and want to get home. Walpole and I are dining domestically at home this evening, having virtuously refused all invitations.

In June he was in Hampshire; on July 25 he writes from Tynemouth:—

I reached here about 5 o'clock, and found the bailiff or whatever they call him of the Board of Conservators, awaiting me with a boat at my disposal. So we went off to look at what they call "The Playground"—two bays in which the salmon coming from the sea rest and disport themselves until a fresh comes down the river and they find it convenient to ascend. Harbottle

bailiff in question is greatly disturbed at the amount of poaching that goes on in the playground, and unfolded his griefs to me at length. It was a lovely evening, very calm, and I enjoyed my boat expedition. To-morrow there is to be another to see the operations of a steam trawler, which in all probability I shall not enjoy so much. I shall take a light breakfast.

These were the pleasanter parts of the work. The less pleasant was sitting all day in a crowded court, hearing a disputed case of fishing rights, or examining witnesses who stuck firmly to views about fish which had long been exploded by careful observation. But on the whole he enjoyed it, although it took him away from research in other departments. This summer, on the death of Professor Rolleston, he was sounded on the question whether he would consent to accept the Linacre Professorship of Physiology at Oxford. He wrote to the Warden of Merton:—

4 MARLBOROUGH PLACE, *June 22, 1881.*

MY DEAR BRODRICK—Many thanks for your letter. I can give you my reply at once, as my attention has already been called to the question you ask; and it is that I do not see my way to leaving London for Oxford. My reasons for arriving at this conclusion are various. I am getting old, and you should have a man in full vigour. I doubt whether the psychical atmosphere of Oxford would suit me, and still more, whether I should suit it after a life spent in the absolute freedom of London. And last, but by no means least, for a man with five children to launch into the world, the change would involve a most serious loss of income. No doubt there are great attractions on the other side; and, if I had been ten years younger, I should have been sorely tempted to go to Oxford, if the University would have had me. But things being as they are, I do not see my way to any other conclusion than that which I have reached.

The same feeling finds expression in a letter to Professor (afterwards Sir William) Flower, who was also approached on the same subject, and similarly determined to remain in London.

*July 21, 1881.*

MY DEAR FLOWER—I am by no means surprised, and except for the sake of the University, not sorry that you have renounced the Linacre.

Life is like walking along a crowded street—there always seem to be fewer obstacles to getting along on the opposite pavement—and yet, if one crosses over, matters are rarely mended.

I assure you it is a great comfort to me to think that you will stay in London and help in keeping things straight in this world of crookedness.

I have thought a good deal about —, but it would never do. No one could value his excellent qualities of all kinds, and real genius in some directions, more than I do; but, in my judgment, nobody could be less fitted to do the work which ought to be done in Oxford— I mean to give biological science a status in the eyes of the Dons, and to force them to acknowledge it as a part of general education. Moreover, his knowledge, vast and minute as it is in some directions, is very imperfect in others, and the attempt to qualify himself for the post would take him away from the investigations, which are his delight and for which he is specially fitted. . . .

I was very much interested in your account of the poor dear Dean's illness. I called on Thursday morning, meeting Jowett and Grove at the door, and we went in and heard such an account of his state that I had hopes he might pull through. We shall not see his like again.

The last time I had a long talk with him was about the proposal to bury George Eliot in the Abbey, and a curious revelation of the extraordinary catholicity and undaunted courage of the man it was. He would have done it had it been pressed upon him by a strong representation.

I see he is to be buried on Monday, and I suppose and hope I shall have the opportunity of attending.—Ever yours very faithfully,

T. H. HUXLEY.

This letter refers to the death of his old friend Dean Stanley. The Dean had long kept in touch with the leaders of scientific thought, and it is deeply interesting to know that on her death-bed, five years before, his wife said to him as one of her parting counsels, "Do not lose sight of the men of science, and do not let them lose sight of you." "And then," writes Stanley to Tyndall, "she named yourself and Huxley."

Strangely enough, the death of the Dean involved another invitation to Huxley to quit London for Oxford. By the appointment of Dean Bradley to Westminster, the Mas-

tership of University College was left vacant. Huxley, who was so far connected with the college that he had examined there for a science Fellowship, was asked if he would accept it, but after careful consideration declined. He writes to his son, who had heard rumours of the affair in Oxford:—

4 MARLBOROUGH PLACE, *Nov.* 4, 1881.

MY DEAR LENS—There is truth in the rumour; in so far as this that I was asked if I would allow myself to be nominated for the Mastership of University, that I took the question into serious consideration and finally declined.

But I was asked to consider the communication made to me confidential, and I observed the condition strictly. The leakage must have taken place among my Oxford friends, and is their responsibility, but at the same time I would rather you did not contribute to rumour on the subject. Of course I should have told you if I had not been bound to reticence.

I was greatly tempted for a short time by the prospect of rest, but when I came to look into the matter closely there were many disadvantages. I do not think I am cut out for a Don nor your mother for a Donness—we have had thirty years' freedom in London, and are too old to put in harness.

Moreover, in a monetary sense I should have lost rather than gained.

My astonishment at the proposal was unfeigned, and I begin to think I may yet be a Bishop.—Ever your loving father,

T. H. HUXLEY.

His other occupations this year were the Medical Acts Commission, which sat until the following year, and the International Medical Congress.

The Congress detained him in London this summer later than usual. It lasted from the 3rd to the 9th of August, on which day he delivered a concluding address on "The Connection of the Biological Sciences with Medicine" (*Coll. Ess.* iii. p. 347). He showed how medicine was gradually raised from mere empiricism and based upon true pathological principles, through the independent growth of physiological knowledge, and its correlation to chemistry and physics. "It is a peculiarity," he remarks, "of the physical sciences that they are independent in proportion as they are imperfect." Yet "there could be no real science of

pathology until the science of physiology had reached a degree of perfection unattained, and indeed unattainable, until quite recent times." Historically speaking, modern physiology, he pointed out, began with Descartes' attempt to explain bodily phenomena on purely physical principles; but the Cartesian notion of one controlling central mechanism had to give way before the proof of varied activities residing in various tissues, until the cell-theory united something of either view. "The body is a machine of the nature of an army, not that of a watch or of a hydraulic apparatus." On this analogy, diseases are derangements either of the physiological units of the body, or of their co-ordinating machinery: and the future of medicine depends on exact knowledge of these derangements and of the precise alteration of the conditions by the administration of drugs or other treatment, which will redress those derangements without disturbing the rest of the body.

A few extracts from letters to his wife describe his occupation at the Congress, which involved too much "society" for his liking.

*August 4.*—The Congress began with great *éclat* yesterday, and the latter part of Paget's address was particularly fine. After, there was the lunch at the Pagets' with the two Royalties. After that, an address by Virchow. After that, dinner at Sanderson's, with a confused splutter of German to the neighbours on my right. After that a tremendous *soirée* at South Kensington, from which I escaped as soon as I could, and got home at midnight. There is a confounded Lord Mayor's dinner this evening ("the usual turtle and speeches to the infinite bewilderment and delight of the foreigners," August 6), and to-morrow a dinner at the Physiological Society. But I have got off the Kew party, and mean to go quietly down to the Spottiswoodes [*i.e.* at Sevenoaks] on Saturday afternoon, and get out of the way of everything except the College of Surgeons' *soirée*, till Tuesday. Commend me for my prudence.

On the 5th he was busy all day with Government Committees, only returning to correct proofs of his address before the social functions of the evening. Next morning he writes:—

I have been toiling at my address this morning. It is all printed, but I must turn it inside out, and make a speech of it if I am to make any impression on the audience in St. James' Hall. Confound all such bobberies.

*August 9.*—I got through my address to-day as well as I ever did anything. There was a large audience, as it was the final meeting of the Congress, and to my surprise I found myself in excellent voice and vigour. So there is life in the old dog yet. But I am greatly relieved it is over, as I have been getting rather shaky.

When the Medical Congress was over, he joined his family at Grasmere for the rest of August. In September he attended the British Association at York, where he read a paper on the "Rise and Progress of Paleontology," and ended the month with fishery business at Aberystwith and Carmarthen.

The above paper is to be found in *Collected Essays*, iv. p. 24. In it he concludes an historical survey of the views held about fossils by a comparison of the opposite hypotheses upon which the vast store of recently accumulated facts may be interpreted; and declaring for the hypothesis of evolution, repeats the remarkable words of the "Coming of Age of the Origin of Species," that "the paleontological discoveries of the last decade are so completely in accordance with the requirements of this hypothesis that, if it had not existed, the paleontologist would have had to invent it."

In February died Thomas Carlyle. Mention has already been made of the influence of his writings upon Huxley in strengthening and fixing once for all, at the very outset of his career, that hatred of shams and love of veracity, which were to be the chief principle of his whole life. It was an obligation he never forgot, and for this, if for nothing else, he was ready to join in a memorial to the man. In reply to a request for his support in so doing, he wrote to Lord Stanley of Alderley on March 9:—

Anything I can do to help in raising a memorial to Carlyle shall be most willingly done. Few men can have dissented more

strongly from his way of looking at things than I; but I should not yield to the most devoted of his followers in gratitude for the bracing wholesome influence of his writings when, as a very young man, I was essaying without rudder or compass to strike out a course for myself.

Mention has already been made (p. 31) of his ill-health at the end of the year, which was perhaps a premonition of the breakdown of 1883. An indication of the same kind may be found in the following letter to Mrs. Tyndall, who had forwarded a document which Dr. Tyndall had meant to send himself with an explanatory note.

4 MARLBOROUGH PLACE, *March 25, 1881.*

MY DEAR MRS. TYNDALL—But where is his last note to me? That is the question on which I have been anxiously hoping for light since I received yours and the inclosure, which contains such a very sensible proposition that I should like to know how it came into existence, abiogenetically or otherwise.

As I am by way of forgetting everything myself just now, it is a comfort to me to believe that Tyndall has forgotten he forgot to send the letter of which he forgot the inclosure. The force of disremembering could no further go.—In affectionate bewilderment, ever yours,

T. H. HUXLEY.

His general view of his health, however, was much more optimistic, as appears from a letter to Mrs. May (wife of the friend of his boyhood) about her son, whose strength had been sapped by typhoid fever, and who had gone out to the Cape to recruit.

4 MARLBOROUGH PLACE, *June 10, 1881.*

MY DEAR MRS. MAY—I promised your daughter the other day that I would send you the Bishop of Natal's letter to me. Unfortunately I had mislaid it, and it only turned up just now when I was making one of my periodical clearances in the chaos of papers that accumulates on my table.

You will be pleased to see how fully the good Bishop appreciates Stuart's excellent qualities, and as to the physical part of the business, though it is sad enough that a young man should be impeded in this way, I think you should be hopeful. Delicate young people often turn out strong old people—I was a thread

paper of a boy myself, and now I am an extremely tough old personage. . . .

With our united kind regards to Mr. May and yourself—  
Ever yours very faithfully,

T. H. HUXLEY.

Perhaps if he had been able each year to carry out the wish expressed in the following letter, which covered an introduction to Dr. Tyndall at his house on the Bel Alp, the breakdown of 1883 might have been averted.

4 MARLBOROUGH PLACE, LONDON, N.W.,  
*July 5 (1881?)*

MY DEAR SKELTON—It is a great deal more than I would say for everybody, but I am sure Tyndall will be very much obliged to me for making you known to him; and if you, insignificant male creature, how very much more for the opportunity of knowing Mrs. Skelton!

For which last pretty speech I hope the lady will make a prettier curtsy. So go boldly across the Aletsch, and if they have a knocker (which I doubt), knock and it shall be opened unto you.

I wish I were going to be there too; but Royal Commissions are a kind of endemic in my constitution, and I have a very bad one just now.\*

With kind remembrances to Mrs. Skelton—Ever yours very faithfully,

T. H. HUXLEY.

The ecclesiastical sound of his new title of Dean of the College of Science afforded him a good deal of amusement. He writes from Grasmere, where he had joined his family for the summer vacation:—

*Aug. 18, 1881.*

MY DEAR DONNELLY—I am astonished that you don't know that a letter to a Dean ought to be addressed "The Very Revd. I don't generally stand much upon etiquette, but when my sacred character is touched I draw the line.

We had athletics here yesterday, and as it was a lovely day all Cumberland and Westmoreland sent contingents to see the fun. . . .

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\* *The Medical Acts Commission, 1881-2.*



This would be a grand place if it were drier, but the rain it raineth every day—yesterday being the only really fine day since our arrival.

However, we all thrive, so I suppose we are adapting ourselves to the medium, and shall be scaly and finny before long.

Haven't you done with Babylon yet? It is high time you were out of it.—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER III

1882

THE year 1882 was a dark year for English science. It was marked by the death of both Charles Darwin and of Francis Balfour, the young investigator, of whom Huxley once said, "He is the only man who can carry out my work." The one was the inevitable end of a great career, in the fulness of time; the other was one of those losses which are the more deplorable as they seem unnecessary, the result of a chance slip, in all the vigour of youth. I remember his coming to our house just before setting out on his fatal visit to Switzerland, and my mother begging him to be careful about risking so valuable a life as his in dangerous ascents. He laughingly replied that he only wanted to conquer one little peak on Mont Blanc. A few days later came the news of his fatal fall upon the precipices of the Aiguille Blanche. Since the death of Edward Forbes, no loss outside the circle of his family had affected my father so deeply. For three days he was utterly prostrated, and was scarcely able either to eat or sleep.

There was indeed a subtle affinity between the two men. My mother, who was greatly attached to Francis Balfour, said once to Sir M. Foster, "He has not got the dash and verve, but otherwise he reminds me curiously of what my husband was in his 'Rattlesnake' days." "How strange," replied Sir Michael, "when he first came to the front, Lankester wrote asking me, 'Who is this man Balfour you are always talking about?' and I answered, 'Well, I can only describe him by saying he is a younger Huxley.'"

Writing to Dr. Dohrn on September 24, Huxley says:—

Heavy blows have fallen upon me this year in losing Darwin and Balfour, the best of the old and the best of the young. I am beginning to feel older than my age myself, and if Balfour had lived I should have cleared out of the way as soon as possible, feeling that the future of Zoological Science in this country was very safe in his hands. As it is, I am afraid I may still be of use for some years, and shall be unable to sing my "Nunc dimittis" with a good conscience.

Darwin was in correspondence with him till quite near the end; having received the volume *Science and Culture*, he wrote on January 12, 1882:—

With respect to automatism,\* I wish that you could review yourself in the old, and, of course, forgotten, trenchant style, and then you would have [to] answer yourself with equal incisiveness; and thus, by Jove, you might go on *ad infinitum* to the joy and instruction of the world.

And again on March 27:—

Your most kind letter has been a real cordial to me. . . . Once again accept my cordial thanks, my dear old friend. I wish to God there were more automata in the world like you.

Darwin died on April 19, and a brief notice being required for the forthcoming number of *Nature* on the 27th, Huxley made shift to write a brief article, which is printed in the *Collected Essays*, ii. p. 244. But as neither he nor Sir Joseph Hooker could at the moment undertake a regular obituary notice, this was entrusted to Professor Romanes, to whom the following letters were written.

4 MARLBOROUGH PLACE, *April 26, 1882.*

MY DEAR ROMANES—Thank you for your hearty letter. I spent many hours over the few paragraphs I sent to *Nature*, in trying to express what all who thoroughly knew and therefore loved Darwin, must feel in language which should be absolutely free from rhetoric or exaggeration.

I have done my best, and the sad thing is that I cannot look for those cheery notes he used to send me in old times, when I had written anything that pleased him.

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\* The allusion is to the 1874 address on "Animals as Automata," which was reprinted in *Science and Culture*.

In case we should miss one another to-day, let me say that it is impossible for me to undertake the obituary in *Nature*. I have a conglomeration of business of various kinds upon my hands just now. I am sure it will be very safe in your hands.—Ever yours very faithfully,

T. H. HUXLEY.

Pray do what you will with what I have written in *Nature*.

4 MARLBOROUGH PLACE, *May 9, 1882.*

MY DEAR ROMANES—I feel it very difficult to offer any useful criticism on what you have written about Darwin, because, although it does not quite please me, I cannot exactly say how I think it might be improved. My own way is to write and re-write things, until by some sort of instinctive process they acquire the condensation and symmetry which satisfies me. And I really could not say how my original drafts are improved until they somehow improve themselves.

Two things however strike me. I think there is too much of the letter about Henslow. I should be disposed to quote only the most characteristic passages.

The other point is that I think strength would be given to your panegyric by a little pruning here and there.

I am not likely to take a low view of Darwin's position in the history of science, but I am disposed to think that Buffon and Lamarck would run him hard in both genius and fertility. In breadth of view and in extent of knowledge these two men were giants, though we are apt to forget their services. Von Bär was another man of the same stamp; Cuvier, in a somewhat lower rank, another; and J. Müller another.

"Colossal" does not seem to me to be the right epithet for Darwin's intellect. He had a clear rapid intelligence, a great memory, a vivid imagination, and what made his greatness was the strict subordination of all these to his love of truth.

But you will be tired of my carping, and you had much better write what seems right and just to yourself.—Ever yours very faithfully,

T. H. HUXLEY.

Two scientific papers published this year were on subjects connected with his work on the fisheries, one "A contribution to the Pathology of the Epidemic known as the 'Salmon Disease'" read before the Royal Society on the occasion of the Prince of Wales being admitted a Fellow (February 21; *Proc. Roy. Soc.* xxxiii. pp. 381-389); the

other on "Saprolegnia in relation to the Salmon Disease" (*Quarterly Journal of Microscopical Science*, xii. pp. 311-333). A third, at the Zoological Society, was on the "Respiratory Organs of Aptyryx" (*Proc. Z. S.* 1882, pp. 560-569). He delivered an address before the Liverpool Institution on "Science and Art in Relation to Education" (*Coll. Ess.* iii. p. 160), and was busy with the Medical Acts Commission, which reported this year.

The aim of this Commission \* was to level up the varying qualifications bestowed by nearly a score of different licensing bodies in the United Kingdom, and to establish some central control by the State over the licensing of medical practitioners.

The report recommended the establishments of Boards in each division of the United Kingdom containing representatives of all the medical bodies in the division. These boards would register students, and admit to a final examination those who had passed the preliminary and minor examinations at the various universities and other bodies already granting degrees and qualifications. Candidates who passed this final examination would be licensed by the General Medical Council, a body to be elected no longer by the separate bodies interested in medical education, but by the Divisional Boards.

The report rejected a scheme for joint examination by the existing bodies, assisted by outside examiners appointed by a central authority, on the ground of difficulty and expense, as well as one for a separate State examination. It also provided for compensation from the fees to be paid by the candidates to existing bodies whose revenues might suffer from the new scheme.

To this majority report, six of the eleven Commissioners appended separate reports, suggesting other methods for carrying out the desired end. Among the latter was Huxley, who gave his reasons for dissenting from the principle assumed by his colleagues, though he had signed the main

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\* For a fuller account of this Commission and the part played in it by Huxley, see his "State and Medical Education" (*Coll. Ess.* iii. 323), published 1884.

report as embodying the best means of carrying out a reform, that principle being granted.

“The State examination,” he thought, “was ideally best, but for many reasons impossible.” But the “conjoint scheme” recommended in the report appeared to punish the efficient medical authorities for the abuses of the inefficient. Moreover, if the examiners of the Divisional Board did not affiliate themselves to any medical authority, the compensation to be provided would be very heavy; if they did, “either they will affiliate without further examination, which will give them the pretence of a further qualification, without any corresponding reality, or they will affiliate in examination, in which case the new examination deprecated by the general voice of the profession will be added, and any real difference between the plan proposed and the ‘State examination’ scheme will vanish.”

The compensation proposed, too, would chiefly fall to the discredited bodies, who had neglected their duties.

The scheme (he writes in his report), which I ventured to suggest is of extreme simplicity; and while I cannot but think that it would prove thoroughly efficient, it interferes with no fair vested interest in such a manner as to give a claim for compensation, and it inflicts no burden either in the way of taxation or extra examination on the medical profession.

This proposal is, that if any examining body satisfies the Medical Council (or other State authority), that it requires full and efficient instruction and examination in the three branches of medicine, surgery, and midwifery; and if it admits a certain number of coadjutor examiners appointed by the State authority, the certificate of that authority shall give admission to the Medical Register.

I submit that while the adopting this proposal would secure a practically uniform minimum standard of examination, it would leave free play to the individuality of the various existing or future universities and medical corporations; that the revenues of such bodies derived from medical examinations would thenceforth increase or diminish in the ratio of their deserts; that a really efficient inspection of the examinations would be secured, and that no one could come upon the register without a complete qualification.

That there was no difficulty in this scheme was shown by the experience of the Scotch Universities; and the expense would be less than the proposed compensation tax.

The chief part of the summer vacation Huxley spent at Lynton, on the north coast of Devonshire. "The Happy Family," he writes to Dr. Dohrn, "has been spending its vacation in this pretty place, eighteen miles of up hill and down dale from any railway." It was a country made for the long rambles he delighted in after the morning's due allowance of writing. And although he generally preferred complete quiet on his holidays, with perfect freedom from all social exigencies, these weeks of rest were rendered all the pleasanter by the unstudied and unexacting friendliness of the family party which centred around Mr. and Mrs. F. Bailey of Lee Abbey hard by—Lady Tenterden, the Julius, and the Henry Pollocks, the latter old friends of ours.

Though his holiday was curtailed at either end, he was greatly set up by it, and writes to chaff his son-in-law for taking too little rest—

I was glad to hear that F. had stood his fortnight's holiday so well; three weeks might have knocked him up!

On the same day, September 26, he wrote the letter to Dr. Dohrn, mentioned above, answering two inquiries—one as to arrangements for exhibiting at the Fisheries Exhibition to be held in London the following year, the other as to whether England would follow the example of Germany and Italy in sending naval officers to the Zoological Station at Naples to be instructed in catching and preserving marine animals for the purposes of scientific research.

With respect to question No. 2, I am afraid my answer must be less hopeful. So far as the British Admiralty is represented by the ordinary British admiral, the only reply to such a proposition as you make that I should expect would be that he (the British admiral, to wit) would see you d—d first. However, I will speak of the matter to the Hydrographer, who really is interested in science, at the first opportunity.

For many years before this, and until the end of his life, there was another side to his correspondence which deserves mention.

I wish that more of the queer letters, which arrived in never-failing streams, had been preserved. A favourite type was the anonymous letter. It prayed fervently, over four pages, that the Almighty would send him down quick into the pit, and was usually signed simply "A Lady." Others came from cranks of every species: the man who demonstrated that the world was flat, or that the atmosphere had no weight—an easy proof, for you weigh a bottle full of air; then break it to pieces, so that it holds nothing; weigh the pieces, and they are the same weight as the whole bottle full of air! Or, again, that the optical law of equality between the angle of incidence and the angle of reflection is a delusion, whence it follows that all our established latitudes are incorrect, and the difference of temperature between Labrador and Ireland, nominally on the same parallel, is easily accounted for. Then came the suggestions of little pieces of work that might so easily be undertaken by a man of Huxley's capacity, learning, and energy. Enormous manuscripts were sent him with a request that he would write a careful criticism of them, and arrange for their publication in the proceedings of some learned society or first-rate magazine. One of the most delightful came this year. A doctor in India, having just read *John Inglesant*, begged Professor Huxley to do for Science what Mr. Shorthouse had done for the Church of England. As for the material difficulties in the way of getting such a book written in the midst of other work, the ingenious doctor suggested the use of a phonograph driven by a gas-engine. The great thoughts dictated into it from the comfort of an armchair, could easily be worked up into novel shape by a collaborator.

India, again, provided the following application of 1885, made in all seriousness by a youthful Punjaabee with scientific aspirations, who feared to be forced into the law. After an intimate account of his life, he modestly appeals for a post in some scientific institution, where he may get his food, do experiments three or four hours a day, and learn English. Latterly his mental activity had been very great:—"I have been contemplating," he says, "to give a



new system of Political Economy to the world. I have questioned, perhaps with success, the validity of some of the fundamental doctrines of H. Spencer's synthetic philosophy," and so on.

Another remarkable communication is a reply-paid telegram from the States, in 1892, which ran as follows:—

Unless all reason and all nature have deceived me, I have found the truth. It is my intention to cross the ocean to consult with those who have helped me most to find it. Shall I be welcome? Please answer at my expense, and God grant we all meet in life on earth.

Another, of British origin this time, was from a man who had to read a paper before a local Literary Society on the momentous question, "Where are we?" so he sent round a circular to various authorities to reinforce his own opinions on the six heads into which he proposed to divide his discourse, viz. :

Where are we in	Space?
„	„ Science?
„	„ Politics?
„	„ Commerce?
„	„ Sociology?
„	„ Theology?

The writer received an answer, and a mild one :

Any adequate reply to your inquiry would be of the nature of a treatise, and that, I regret, I cannot undertake to write.

Two letters of this year touch on Irish affairs, in which he was always interested, having withal a certain first-hand knowledge of the people and the country they lived in, from his visits there, both as a Fishery Commissioner and on other occasions. He writes warmly to the historian who treated of Ireland without prejudice or rancour.

4 MARLBOROUGH PLACE, *April* 16, 1882.

MY DEAR LECKY—Accept my best thanks for your two volumes, which I found on my return from Scotland yesterday.

I can give no better evidence of my appreciation of their contents than by the confession that they have caused me to

neglect my proper business all yesterday evening and all to-day.

The section devoted to Irish affairs is a model of lucidity, and bears on its face the stamp of justice and fair dealing. It is a most worthy continuation of the chapter on the same subject in the first volume, and that is giving high praise.

You see I write as if I knew something about the subject, but you are responsible for creating the delusion.

With kindest remembrances to Mrs. Lecky—Ever yours very faithfully,  
T. H. HUXLEY.

A few weeks later, the murder of Lord Frederick Cavendish sent a thrill of horror throughout England. Huxley was as deeply moved as any, but wrote calmly of the situation.

#### TO HIS ELDEST SON

4 MARLBOROUGH PLACE, *May 9, 1882.*

MY DEAR LEONARD—Best thanks for your good wishes.\* Notwithstanding the disease of A.D., which always proves mortal sooner or later, I am in excellent case. . . .

I knew both Lord F. Cavendish and his wife and Mr. Burke. I have never been able to get poor Lady Frederick out of my head since the news arrived.

The public mind has been more stirred than by anything since the Indian Mutiny. But if the Government keep their heads cool, great good may come out of the evil, horrible as it is. The Fenians have reckoned on creating an irreparable breach between England and Ireland. It should be our business to disappoint them first and extirpate them afterwards. But the newspaper writers make me sick, especially the *Times*.—Ever your affectionate father,  
T. H. HUXLEY.

It is interesting, also, to see how he appeared about this time to one of a younger generation, acute, indeed, and discriminating, but predisposed by circumstances and upbringing to regard him at first with curiosity rather than sympathy. For this account I am indebted to one who has the habit, so laudable in good hands, of keeping a journal of events and conversations. I have every confidence in the substantial accuracy of so well trained a reporter.

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\* For his birthday, May 4.

## EXTRACT FROM JOURNAL

Nov. 25, 1882.

In the evening we dined at the ——'s, chiefly a family party with the addition of Professor Huxley and his wife and ourselves. Much lively conversation, after dinner, begun among the ladies, but continued after the gentlemen appeared, on the subjects of Truth, Education, and Women's Rights, or, more strictly speaking, women's capabilities. Our hostess (Lady ——) was, if possible, more vehement and paradoxical than her wont, and vigorously maintained that *truth* was no virtue in itself, but must be inculcated for expediency's sake. The opposite view found a champion in Professor Huxley, who described himself as "almost a fanatic for the sanctity of truth." Lady —— urged that truth was often a very selfish virtue, and that a man of noble and unselfish character might lie for the sake of a friend, to which some one replied that after a course of this unselfish lying the noble character was pretty sure to deteriorate, while the Professor laughingly suggested that the owner had a good chance of finding himself landed ultimately in Botany Bay.

The celebrated instance of John Inglesant's perjury for the sake of Charles I. was then brought forward, and it was this which led Professor Huxley to say that in his judgment no one had the right passively to submit to a false accusation, and that "moral suicide" was as blameworthy as physical suicide. "He may refuse to commit another, but he ought not to allow himself to be believed worse than he actually is. It is a loss to the world of *moral force*, which cannot be afforded."

. . . Then as regards women's powers. The Professor said he did not believe in their ever succeeding in a competition with men. Then he went on:—"I can't help looking at women with something of the eye of a physiologist. Twenty years ago I thought the womanhood of England was going to the dogs," but now, he said, he observed a wonderful change for the better. We asked to what he attributed it. Was it to lawn tennis and the greater variety of bodily exercises? "Partly," he answered, "but much more to their having more *pursuits*—more to interest them and to occupy their thoughts and time."

The following letter bears upon the question of employing retired engineer officers in administrative posts in the Science and Art Department:—

THE ROOKERY, LYNTON, *Sept.* 19, 1882.

MY DEAR DONNELLY—Your letter seems to have arrived her the very day I left for Whitby, whither I had to betake myself to inspect a weir, so I did not get it until my return last night.

I am extremely sorry to hear of the possibility of Martin's giving up his post. He took so much interest in the work and was so very pleasant to deal with, that I do not think we shall easily find any one to replace him.

If you will find another R.E. at all like him, in Heaven's name catch him and put him in, job or no job.

The objection to a small clerk is that we want somebody who knows how to deal with men, and especially young men on the one hand, and especially cantankerous (more or less) old scientific buffers on the other.

The objection to a man of science is that (1) we want a man of business and not a m.s., and (2) that no man scientifically worth having that I know of is likely to take such an office.

"As at present advised" I am all for an R.E., so I cannot have the pleasure even of trying to convert you.

With our united kindest regards—Ever yours very faithfully,  
T. H. HUXLEY.

I return next Monday.

Two letters of thanks follow, one at the beginning of the year to Mr. Herbert Spencer for the gift of a very fine photograph of himself; the other, at the end of the year, to Mr. (afterwards Sir John) Skelton, for his book on *Mary Queen of Scots and the Casket Letters*.

As to the former, it must be premised that Mr. Spence abhorred exaggeration and inexact talk, and would ruthlessly prick the airy bubbles which endued the conversation of the daughters of the house with more buoyancy than strict logic, a gift which, he averred, was denied to woman.

4 MARLBOROUGH PLACE, *Jan.* 25, 1882.

MY DEAR SPENCER—Best thanks for the photograph. It is very good, though there is just a touch of severity in the eye. We shall hang it up in the dining-room, and if anybody is guilty of exaggerated expressions or bad logic (five women kind habitually sit round that table), I trust they will feel that that eye is upon them.—Ever yours very faithfully,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., *Dec. 31, 1882.*

MY DEAR SKELTON—If I may not thank you for the book you have been kind enough to send me, I may at anyrate wish you and Mrs. Skelton a happy New Year and many on 'em.

I am going to read your vindication of Mary Stuart as soon as I can. Hitherto I am sorry to say I have classed her with Eve, Helen, Cleopatra, Delilah, and sundry other glorious —s who have lured men to their destruction.

But I am open to conviction, and ready to believe that she blew up her husband only a little more thoroughly than other women do, by reason of her keener perception of logic.—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER IV

1883

THE pressure of official work, which had been constantly growing since 1880, reached its highest point in 1883. Only one scientific memoir\* was published by him this year, and then no more for the next four years. The intervals of lecturing and examining were chiefly filled by fishery business, from which, according to his usual custom when immersed in any investigation, he chose the subject, "Oysters and the Oyster Question," both for his Friday evening discourse at the Royal Institution on May 11, and for his course to Working Men between Jan. 8 and Feb. 12.

There are the usual notes of all seasons at all parts of England. A deserted hotel at Cromer in January was uninviting.

My windows look out on a wintry sea, and it is bitter cold. Notwithstanding, a large number of the aquatic gentlemen to whom I shall have the pleasure of listening, by and by, are loafing against the railings opposite, as only fishermen can loaf.

In April he had been ill, and his wife begged him to put off some business which had to be done at York. But unless absolutely ordered to bed by his doctor, nothing would induce him to put personal convenience before public duty. However, he took his son to look after him.

I am none the worse for my journey (he writes from York), rather the better; so Clark is justified, and I should have failed

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\* Contributions to Morphology, Ichthyopsida, No. 2. On the Oviducts of *Osmerus*; with remarks on the relations of the Teleostean with the Ganoid Fishes (*Proc. Zool. Soc.* 1883, pp. 132-139).

in my duty if I had not come. H. looks after me almost as well as you could do.

To make amends, fishery business in the west country during a fine summer had "a good deal of holiday in it," though a cross journey at the beginning of August from Abergavenny to Totness made him write:—

If ever (except to-morrow, by the way) I travel within measurable distance of a Bank Holiday by the Great Western, may jacksasses sit on my grandmother's grave.

As the business connected with the Inspectorship had been enlarged in the preceding years by exhibitions at Norwich and Edinburgh, so it was enlarged this year, and to a still greater extent, by the Fisheries Exhibition in London. This involved upon him as Commissioner, not only the organisation of the Conference on Fish Diseases and the paper on the Diseases of Fish already mentioned, but administration, committee meetings, and more—a speech on behalf of the Commissioners in reply to the welcome given them by the Prince of Wales at the opening of the exhibition. On the following day he expressed his feelings at this mode of spending his time in a letter to Sir M. Foster.

I am dog-tired with yesterday's function. Had to be at the Exhibition in full fig at 10 A.M., and did not get home from the Fishmongers' dinner till 1.20 this morning.

Will you tell me what all this has to do with my business in life, and why the last fragments of a misspent life that are left to me are to be frittered away in all this drivel?—Yours savagely,  
T. H. H.

Later in the year, also, he had to serve on another Fishery Commission much against his will, though on the understanding that, in view of his other engagements, he need not attend all the sittings.

A more satisfactory result of the Exhibition was that he found himself brought into close contact with several of the great city companies, whose enormous resources he had long been trying, not without some success, to enlist on behalf of technical and scientific education.

Among these may be noted the Fishmongers, the Mercers, who had already interested themselves in technical education, and gave their hall for the meetings of the City and Guilds Council, of which Huxley was an active member; the Clothworkers, in whose schools he distributed the prizes this year; and, not least, the Salters, who presented him with their freedom on November 13. Their master, Mr. J. W. Clark, writing in August, after Huxley had accepted their proposal, says: "I think you must admit that the City Companies have yielded liberally to the gentle compression you have exercised on them. So far from helping you to act the traitor, we propose to legitimise your claim for education, which several of us shall be willing to unite with you in promoting" (see vol. i, p. 508).

The crowning addition, however, to Huxley's official work was the Presidency of the Royal Society. He had resigned the Secretaryship in 1880, after holding office for nine years under three Presidents — Airy, Hooker, and Spottiswoode. Spottiswoode, like Hooker, was a member of the *x* Club, and was regarded with great affection and respect by Huxley, who in 1887 wrote of him to Mr. John Morley:—

It is quite absurd you don't know Spottiswoode, and I shall do both him and you a good turn by bringing you together. He is one of my best friends, and comes under the A1 class of "people with whom you may go tiger-hunting."

On June 7, writing to Professor (afterwards Sir E.) Frankland, he says:—

You will have heard that Spottiswoode is seriously ill. The physicians suspect typhoid, but are not quite certain. I called this morning, and hear that he remains much as he has been for the last two or three days. So many of our friends have dropped away in the course of the last two years that I am perhaps morbidly anxious about Spottiswoode, but there is no question that his condition is such as to cause grave anxiety.

But by the end of the month his fears were realised. Consequently it devolved upon the Council of the Royal Society to elect one of their own body to hold office until



the St. Andrew's Day following, when a regular President would be elected at a general meeting of the Society.

Huxley himself had no wish to stand. He writes to Sir M. Foster on June 27, announcing Spottiswoode's death, which had taken place that morning:—

It is very grievous in all ways. Only the other day he and I were talking of the almost miraculous way in which the *x* Club had held together without a break for some 18 years, and little did either of us suspect that he would be the first to go.

A heavy responsibility falls on you in the Royal Society. It strikes me you will have to call another meeting of the Council before the recess for the consideration of the question of the Presidency. It is hateful to talk of these things, but I want you to form some notion of what had best be done as you come up to-morrow.

— is a possibility, but none of the other officers I think.

Indeed, he wished to diminish his official distractions rather than to increase them. His health was unlikely to stand any additional strain, and he longed to devote the remainder of his working years to his unfinished scientific researches. But he felt very strongly that the President of the Royal Society ought to be chosen for his eminence in science, not on account of social position, or of wealth, even though the wealth might have been acquired through the applications of science. The acknowledgment of this principle had led some years back to the great revolution from within, which succeeded in making the Society the living centre and representative of science for the whole country, and he was above all things anxious that the principle should be maintained. He was assured, however, from several quarters that unless he allowed himself to be put forward, there was danger lest the principle should be disregarded.

Moved by these considerations of public necessity, he unwillingly consented to be nominated, but only to fill the vacancy till the general meeting, when the whole Society could make a new choice. Yet even this limitation seemed difficult to maintain in the face of the widely expressed desire that he would then stand for the usual period of five

years. "The worst of it is," he wrote to Sir M. Foster on July 2, "that I see myself gravitating towards the Presidency *en permanence*, that is to say, for the ordinary period. And that is what I by no means desired. — has been at me (as a sort of deputation, he told me, from a lot of the younger men) to stand. However, I suppose there is no need to come to any decision yet."

The following letters, in reply to congratulations on his election, illustrate his attitude of mind in the affair:—

#### TO THE WARDEN OF MERTON

HINDHEAD, *July 8, 1883.*

MY DEAR BRODRICK—I do not get so many pleasant letters that I can afford to leave the senders of such things unthanked.

I am very much obliged for your congratulations, and I may say that I accepted the office *inter alia* for the purpose of getting people to believe that such places may be properly held by people who have neither riches nor station—who want nothing that statesmen can give—and who care for nothing except upholding the dignity and the freedom of science.—Ever yours very faithfully,

T. H. HUXLEY.

#### TO SIR W. H. FLOWER, F.R.S.

4 MARLBOROUGH PLACE, *July 7, 1883.*

MY DEAR FLOWER—I am overwhelmed by the kind letters I get from all sides, and I need hardly say that I particularly value yours.

A month ago I said that I ought not, could not, and would not take the Presidency under any circumstances whatever. My wife was dead against it, and you know how hen-pecked I am.

Even when I was asked to take the Presidency to the end of the year and agreed, I stipulated for my freedom next St. Andrew's Day.

But such strong representations were made to me by some of the younger men about the dangers of the situation, that at the last moment almost I changed my mind.

However, I wanted it to be clearly understood that the Council and the Society are, so far as I am concerned, perfectly free to put somebody else in my place next November. All I stipulate for is that my successor shall be a man of science.

I will not, if I can help it, allow the chair of the Royal So-

ciety to become the apanage of rich men, or have the noble old Society exploited by enterprising commercial gents who make their profit out of the application of science.

Mrs. President was *not* pleased—quite the contrary—but she is mollified by the kindly expressions, public and private, which have received the election.

And there are none which we both value more than yours. (I see I said that before, but I can't say it too often.)—Ever yours very faithfully,  
T. H. HUXLEY.

HINDHEAD, *July 8, 1883.*

MY DEAR FLOWER—Many thanks for your comforting letter. When I am fairly committed to anything I generally have a cold fit—and your judgment that I have done right is “grateful and comforting” like Epps’ Cocoa. It is not so much work as distraction that is involved; and though it may put a stop to my purely scientific work for a while, I don’t know that I could be better employed in the interests of science than in trying to keep the Royal Society straight.

My wife was very much against it at first—and indeed when I was first spoken to I declared that I would not go on after next St. Andrew’s Day. But a good deal of pressure was brought to bear by some of my friends, and if the Fellows don’t turn me out I shall say with MacMahon, “J’y suis et j’y reste.”—Ever yours very faithfully,  
T. H. HUXLEY.

We have run down here for a day, but are back to-morrow.

4 MARLBOROUGH PLACE, *July 10, 1883.*

MY DEAR SPENCER—What an agreeable surprise your letter has been. I have been expecting the most awful scolding for taking more work, and behold as sweetly congratulatory an epistle as a man could wish.

Three weeks ago I swore by all my gods that I would not take the offer at any price, but I suppose the infusion of Theism was too homœopathic for the oath to bind.

Go on sleeping, my dear friend. If you are so amiable with three nights, what will you be with three weeks?

What a shame no rain is sent you. You will be speaking about Providence as I heard of a Yankee doing the other day—“Wal, sir, I guess he’s good; but he’s careless.”

I think there is a good deal in that view of the government of the world.—Ever yours very faithfully,

T. H. HUXLEY.

## TO HIS ELDEST DAUGHTER

4 MARLBOROUGH PLACE, *July 14, 1883.*

DEAREST JESS—I am not sure either whether my accession to the Presidency is a matter for congratulation. Honour and glory are all very fine, but on the whole I prefer peace and quietness, and three weeks ago I declared I would have nothing to do with it.

But there are a good many circumstances in the present state of affairs which weighed heavily in the scale, and so I made up my mind to try the experiment.

If I don't suit the office or the office don't suit me, there is a way out every 30th of November.

There was more work connected with the Secretaryship—but there is more trouble and responsibility and distraction in the Presidency.

I am amused with your account of your way of governing your headstrong boy. I find the way of governing headstrong men to be very similar, and I believe it is by practising the method that I get the measure of success with which people credit me.

But they are often very fractious, and it is a bother for a man who was meant for a student.

Poor Spottiswoode's death was a great blow to me. Never was a better man, and I hoped he would stop where he was for the next ten years. . . .—Ever your loving father,

T. H. HUXLEY.

He finally decided that the question of standing again in November must depend on whether this course was likely to cause division in the ranks of the Society. He earnestly desired to avoid anything like a contest for scientific honours; \* he was almost morbidly anxious that the temporary choice of himself should not be interpreted as binding the electors in any way.

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\* As he wrote a little later:—"I have never competed in the way of honour in my life, and I cannot allow myself to be even thought of as in such a position now, where, with all respect to the honour and glory, they do not appear to me to be in any way equivalent to the burden. And I am not at all sure that I may not be able to serve the right cause outside the Chair rather than in it."

I give the following letters to show his sensitiveness on every question of honour and of public advantage:—

BRECHIN CASTLE, BRECHIN, N.B.,  
*Sept.* 19, 1883.

MY DEAR FOSTER—We got here yesterday. The Commission does not meet till next week, so like the historical donkey of Jeshurun I have nothing to do but to wax fat and kick in this excellent pasture.

At odd times lately my mind has been a good deal exercised about the Royal Society. I am quite willing to go on in the chair if the Council and the Society wish it. But it is quite possible that the Council who chose me when the choice was limited to their own body, might be disposed to select some one else when the range of choice is extended to the whole body of the Society. And I am very anxious that the Council should be made to understand, when the question comes forward for discussion after the recess, that the fact of present tenancy constitutes no claim in my eyes.

The difficulty is, how is this to be done? I cannot ask the Council to do as they please, without reference to me, because I am bound to assume that that is what they will do, and it would be an impertinence to assume the contrary.

On the other hand, I should at once decline to be put in nomination again, if it could be said that by doing so I had practically forced myself either upon the Council or upon the Society.

Heaven be praised I have not many enemies, but the two or three with whom I have to reckon don't stick at trifles, and I should not like by any inadvertence to give them a handle.

I have had some thought of writing a letter to Evans,\* such as he could read to the Council at the first meeting in October, at which I need not be present.

The subject could then be freely discussed, without any voting or resolution on the minutes, and the officers could let me know whether in their judgment it is expedient I should be nominated or not.

In the last case I should withdraw on the ground of my other occupations—which, in fact, is a very real obstacle, and one which looms large in my fits of blue-devils, which have been more frequent of late than they should be in holiday time.

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\* Sir John Evans, K.C.B., then Treasurer of the Royal Society.

Now, will you turn all this over in your mind? Perhaps you might talk it over with Stokes.

Of course I am very sensible of the honour of being P.R.S., but I should be much more sensible of the dishonour of being in that place by a fluke, or in any other way, than by the free choice of the Council and Society.

In fact I am inclined to think that I am morbidly sensitive on the last point; and so, instead of acting on my own impulse, as I have been tempted to do, I submit myself to your worship's wisdom.

I am not sure that I should not have been wiser if I had stuck to my original intention of holding office only till St. Andrew's Day.—Ever yours very faithfully,

T. H. HUXLEY.

SECRETARY OF STATE, HOME DEPARTMENT,  
Oct. 3, 1883.

MY DEAR FOSTER—There was an Irish bricklayer who once bet a hodman he would not carry him up to the top of an exceeding high ladder in his hod. The hodman did it, but Paddy said, "I had great hopes, now, ye'd let me fall just about six rounds from the top."

I told the story before when I was up for the School Board, but it is so applicable to the present case that I can't help coming out with it again.

If you, dear good hodman, would have but let me fall!

However, as the thing is to be, it is very pleasant to find Evans and Williamson and you so hearty in the process of elevation, and in spite of blue-devils I will do my best to "do my duty in the state of life I'm called to."

But I believe you never had the advantage of learning the Church Catechism.

If there is any good in what is done you certainly deserve the credit of it, for nothing but your letter stopped me from kicking over the traces at once. Do you see how Evolution is getting made into a bolus and oiled outside for the ecclesiastical swallow? \*—Ever thine,

THOMAS, P.R.S.

The same feeling appears in his anxiety as President to avoid the slightest appearance of committing the Society to

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\* This refers to papers read before the Church Congress that year by Messrs. W. H. Flower and Legros Clarke.

debatable opinions which he supported as a private individual. Thus, although he had "personally, politically, and philosophically" no liking for Charles Bradlaugh, he objected on general grounds to the exclusion of Mrs. Besant and Miss Bradlaugh from the classes at University College, and had signed a memorial in their favour. On the other hand, he did not wish it to be asserted that the Royal Society, through its President, had thrown its influence into what was really a social and political, not a scientific question. He writes to Sir M. Foster on July 18:—

It is very unlucky for me that I signed the memorial requesting the Council of University College to reconsider their decision about Mrs. Besant and Miss Bradlaugh when I was quite innocent of my possibility of holding the P.R.S.

I must go to the meeting of members to-day and define my position in the matter with more care, under the circumstances.

Mrs. Besant was a student in my teacher's class here last year, and a very well-conducted lady-like person; but I have never been able to get hold of the "Fruits of Philosophy," and do not know to what doctrine she has committed herself.

They seem to have excluded Miss Bradlaugh simply on the *noscitur a sociis* principle.

It will need all the dexterity I possess to stand up for the principle of religious and philosophical freedom, without giving other people a hold for saying that I have identified myself with Bradlaugh.

It was the same a little later with the Sunday Society, which had offered him its presidency. He writes to the Hon. Sec. on Feb. 11, 1884:—

I regret that it is impossible for me to accept the office which the Sunday Society honours me by offering.

It is not merely a disinclination to add to the work which already falls to my share which leads me to say this. So long as I am President of the Royal Society, I shall feel bound to abstain from taking any prominent part in public movements as to the propriety of which the opinions of the Fellows of the Society differ widely.

My own opinions on the Sunday question are exactly what they were five-and-twenty years ago. They had not been hid under a bushel, and I should not have accepted my present office

if I had felt that so doing debarred me from reiterating them whenever it may be necessary to do so.

But that is a different matter from taking a step which would, in the eyes of the public, commit the Royal Society, through its President, to one side of the controversy in which you are engaged, and in which I, personally, hope you may succeed as warmly as ever I did.

One other piece of work during the first half of the year remains to be mentioned, namely, the Rede Lecture, delivered at Cambridge on June 12. This was a discourse on Evolution, based upon the consideration of the Pearly Nautilus.

He first traced the evolution of the individual from the ovum, and replied to the three usual objections raised to evolution, that it is impossible, immoral, and contrary to the argument of design, by replying to the first, that it does occur in every individual; to the second, that the morality which opposes itself to truth commits suicide; and to the third that Paley—the most interesting Sunday reading allowed him when a boy—had long since answered this objection.

Then he proceeded to discuss the evolution of the 100 species, all extinct but two, of Nautilus. The alternative theory of new construction, a hundred times over, is opposed alike to tradition and to sane science. On the other hand, evolution, tested by paleontology, proves a sound hypothesis. The great difficulty of science is in tracing every event to those causes which are in present operation; the hypothesis of evolution is analogous to what is going on now.

The summer was passed at Milford, near Godalming, in a house at the very edge of the heather country which from there stretches unbroken past Hindhead and into Wolmer Forest. So well did he like the place that he took it again the following year. But his holiday was like to have been spoilt at the beginning by the strain of an absurd misadventure which involved much fatigue and more anxiety.

I came back only last night (he writes to Sir M. Foster on August 1) from Paris, where I sped on Sunday night, in a horrid



state of alarm from a cursed blundering telegram which led me to believe that Leonard (you know he got his first class to our great joy) who had left for the continent on Saturday, was ill or had had an accident.

It was indeed a hurried journey. On receipt of the telegram, he rushed to Victoria only to miss the night mail. The booking-clerk suggested that he should drive to London Bridge, take train to Lewes, and thence take a fly to Newhaven, where he ought to catch a later boat. The problem was to catch the London Bridge train. There was barely a quarter of an hour, but thanks to a good horse and the Sunday absence of traffic, the thing was done, establishing, I believe, what the modern mind delights in, a record in cab-driving. Happily the anxiety at not finding his son in Paris was soon allayed by another telegram from home, where his son-in-law, the innocent sender of the original message, had meanwhile arrived. He writes to Sir M. Foster:—

Judging by my scrawl, which is worse than usual, I should say the anxiety had left its mark, but I am none the worse otherwise.

This was indeed the case. Other letters to Sir M. Foster show that he was unusually well, perhaps because he was really making holiday to some extent. Thus on August 16, he writes:—

This is a lovely country, and I have been reading novels and walking about for the last four days. I must be all right, wind and limb, for I walked over twenty miles the day before yesterday, and except a blister on one heel, was none the worse.

And again on September 12:—

Have been very lazy lately, which means that I have done a great many things that I need not have done, and have left undone those which I ought to have done. Nowadays that seems to me to be the real definition of a holiday.

For once he was not doing very much holiday work, though he was filing at the Rede Lecture to get it into shape for publication. The examinations for the Science and Art

Department were over, and indeed he writes to Sir M. Foster:—

Don't bother your head about the balance—now or hereafter. To tell you the truth I do so little in the Examiner business that I am getting ashamed of taking even the retaining fee, and you will do me a favour if you will ease my conscience.

A week of fishery business in South Wales and Devon had “a good deal of holiday in it.” For the rest—

I have just been put on Senate of University of London [a Crown nomination]. I tried hard to get Lord Granville to let me off—in fact I told him I could not attend the meetings except now and then, but there was no escape. I must have a talk with you about what is to be done there.

*Item.*—There is a new Fishery Commission that I also strongly objected to, but had to cave in so far as I agreed to attend some meetings in latter half of September.

On this occasion Lord Granville had written back:—

11 CARLTON HOUSE TERRACE, *July 28, 1883.*

MY DEAR PROFESSOR HUXLEY—Clay, the great whist player, once made a mistake and said to his partner, “My brain is softening,” the latter answered, “Never mind, I will give you £10,000 down for it, just as it is.”

On that principle and backed up by Paget I shall write to Harcourt on Monday.—Yours sincerely,  
GRANVILLE.

The Commission of course cut short the stay at Milford, and on September 12, he writes:—

We shall leave this on Friday as my wife has some fal-lals to look after before we start for the north on Monday.

The worst of it is that it is not at all certain that the Commission will meet and do any work. However I am pledged to go and I daresay that Brechin Castle is a very pleasant place to stay in.

Lastly, he was thinking over the obituary notice of Darwin which he had undertaken to write for the Royal Society—though it did not appear till 1888—that on F. Balfour being written by Sir M. Foster.

HIGHCROFT HOUSE, MILFORD, GODALMING,  
*Aug. 27, 1883.*

MY DEAR FOSTER—I do not see anything to add or alter to what you have said about Balfour, except to get rid of that terrible word “urinogenital,” which he invented, and I believe I once adopted, out of mere sympathy I suppose.

Darwin is on my mind, and I will see what can be done here by and by. Up to the present I have been filing away at the Rede Lecture. I believe that getting things into shape takes me more and more trouble as I get older—whether it is a loss of faculty or an increase of fastidiousness I can’t say—but at any rate it costs me more time and trouble to get things finished—and when they are done I should prefer burning to publishing them.

Haven’t you any suggestions to offer for Anniversary address? I think the Secretaries ought to draw it up, like a Queen’s speech.

Mind we have a talk some day about University of London. I suppose you want an English Sorbonne. I have thought of it at times, but the Philistines are strong.

Weather jolly, but altogether too hot for anything but lying on the grass “under the tegmination of the patulous fage,” as the poet observes.—Ever yours very faithfully,

T. H. HUXLEY.

The remaining letters of this year are for the most part on Royal Society business, some of which, touching the anniversary dinner, may be quoted:—

4 MARLBOROUGH PLACE, *Nov. 10, 1883.*

MY DEAR FOSTER— . . . I have been trying to get some political and other swells to come to the dinner. Lord Mayor is coming—thought I would ask him on account of City and Guilds business—Lord Chancellor, probably, Courtney, M.P., promised, and I made the greatest blunder I ever made in all my life by thoughtlessly writing to ask Chamberlain (!!!) utterly forgetting the row with Tyndall.\*

By the mercy of Providence he can’t come this year, though I must ask him next (if I am not kicked out for my sins before that), as he is anxious to come. Science ought to be in league with the Radicals. . . . Ever yours,  
 T. H. HUXLEY.

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\* Concerning the Lighthouses.

He had made prompt confession as soon as he discovered his mistake, to Tyndall himself, who ultimately came to the dinner and proposed the health of his old friend Hirst.

4 MARLBOROUGH PLACE, Nov. 9, 1883.

MY DEAR TYNDALL—I have been going to write to you for two or three days to ask you to propose Hirst's health as Royal Medallist on the 30th November. I am sure your doing so would give an extra value to the medal to him.

But now I realise the position of those poor devils I have seen in lunatic asylums and who believed they have committed the unforgivable sin. It came upon me suddenly in Waterloo Place this evening, that I had done so; and I went straight to the Royal Institution to make confession, and if possible get absolution. But I heard you had gone to Hindhead, and so I write.

Yesterday I was sending some invitations to the dinner on the 30th, and thinking to please the Society I made a shot at some ministers. The only two I know much about are Harcourt and Chamberlain, and the devil (in whom I now firmly believe) put it into my head to write to both.

The enormous stupidity of which I had been guilty in asking Chamberlain under the circumstances, and the sort of construction you and others might put upon it, never entered my head till this afternoon. It really made me ill, and I went straight to find you. If Providence is good to me the letter will miscarry and he won't come. But anyhow I want you to know that I have been idiotically stupid, and that I wish the Presidency and the dinner and everything connected with it at the bottom of the sea, if you are as much disgusted with me as you have a perfect right to be.—Ever yours faithfully,

T. H. HUXLEY.

The following refers to a newly-founded society at Newcastle, which had invited him to become one of its vice-presidents:—

4 MARLBOROUGH PLACE, N.W., Dec. 30, 1883.

MY DEAR MORLEY—The Newcastle people wrote to me some time ago telling me that Sir W. Armstrong was going to be their President. Armstrong is an old friend of mine, so I wrote to him to make inquiries. He told me that he was not going to be President, and knew nothing about the people who were

getting up the Society. So I declined to have anything to do with it.

However, the case is altered now that you are in the swim. You have no gods to swear by, unfortunately; but if you will affirm, in the name of X, that under no circumstances shall I be called upon to do anything, they may have my name among the V.-P.'s and much good may it do them.

All our good wishes to you and yours. The great thing one has to wish for as time goes on is vigour as long as one lives, and death as soon as vigour flags.

It is a curious thing that I find my dislike to the thought of extinction increasing as I get older and nearer the goal.

It flashes across me at all sorts of times with a sort of horror that in 1900 I shall probably know no more of what is going on than I did in 1800. I had sooner be in hell a good deal—at any rate in one of the upper circles, where the climate and company are not too trying. I wonder if you are plagued in this way.—Ever yours,

T. H. H.

The following letters, to his family or to intimate friends, are in lighter vein. The first is to Sir M. Foster; the concluding item of information in reply to several enquiries. The Royal Society wished some borings made in Egypt to determine the depth of the stratum of Nile mud:—

The Egyptian exploration society is wholly archæological—at least from the cut of it I have no doubt it is so—and they want all their money to find out the pawnbrokers' shops which Israel kept in Pithom and Rameses—and then went off with the pledges.

This is the real reason why Pharaoh and his host pursued them; and then Moses and Aaron bribed the post-boys to take out the lynch-pins.

That is the real story of the Exodus—as detailed in a recently discovered papyrus which neither Brugsch nor Maspero have as yet got hold of.

#### TO HIS YOUNGEST DAUGHTER

4 MARLBOROUGH PLACE, N.W., *April 12, 1883.*

DEAREST PABELUNZA—I was quite overcome to-day to find that you had vanished without a parting embrace to your “faded

but fascinating" \* parent. I clean forgot you were going to leave this peaceful village for the whirl of Gloucester dissipation this morning—and the traces of weeping on your visage, which should have reminded me of our imminent parting, were absent.

My dear, I should like to have given you some good counsel. You are but a simple village maiden—don't be taken by the appearance of anybody. Consult your father—in-closing photograph and measurement (in inches)—in any case of difficulty.

Also give my love to the matron your sister, and tell her to look sharp after you. Treat her with more respect than you do your venerable P.—whose life will be gloom hidden by a film of heartless jests till you return.

*Item.*—Kisses to Ria and Co.—Your desolated Pater.

### TO HIS ELDEST DAUGHTER

4 MARLBOROUGH PLACE, *May 6, 1883.*

DEAREST JESS—Best thanks for your good wishes—considering all things I am a hale old gentleman. But I had to speak last night at the Academy dinner, and either that or the quantity of cigars I smoked, following the bad example of our friend "Wales," has left me rather shaky to-day. It was trying, because Jack's capital portrait was hanging just behind me—and somebody remarked that it was a better likeness of me than I was. If you begin to think of that it is rather confusing.

I am grieved to have such accounts of Ethel, and have lectured her accordingly. She threatens reprisals on you—and altogether is in a more saucy and irrepressible state than when she left.

M— is still in bed, though better—I am afraid she won't be able to go to Court next week. You see we are getting grand.

I hear great accounts of the children (Ria and Buzzer) and mean to cut out T'other Governor when you bring them up.

As we did not see Fred the other day, the family is inclined to think that the salmon disagreed with him!—Ever your loving father,

T. H. HUXLEY.

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\* A fragment of feminine conversation overheard at the Dublin meeting of the British Association, 1878. "Oh, there comes Professor Huxley: faded, but still fascinating."

4 MARLBOROUGH PLACE, *May 10, 1883.*

MY DEAR MRS. TYNDALL — If you will give me a bit of mutton at one o'clock I shall be very much your debtor, but as I have business to attend to afterwards at the Home Office I must stipulate that my intellect be not imperilled by those seductive evil genii who are apt to make their appearance at your lunch table.\*

M. is getting better, but I cannot let her be out at night yet. She thinks she is to be allowed to go to the International Exhibition business on Saturday; but if the temperature does not rise very considerably I shall have two words to say to that.—  
Ever yours very sincerely, T. H. HUXLEY.

I shall be alone. Do you think that I am “subdued to that I work in,” and like an oyster, carry my brood about beneath my mantle?

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\* This is accompanied by a sketch of a champagne bottle in the character of a demon.

## CHAPTER V

1884

FROM this time forward the burden of ill-health grew slowly and steadily. Dyspepsia and the hypochondriacal depression which follows in its train, again attacked Huxley as they had attacked him twelve years before, though this time the physical misery was perhaps less. His energy was sapped; when his official work was over, he could hardly bring himself to renew the investigations in which he had always delighted. To stoop over the microscope was a physical discomfort; he began to devote himself more exclusively to the reading of philosophy and critical theology. This was the time of which Sir M. Foster writes that "there was something working in him which made his hand, when turned to anatomical science, so heavy that he could not lift it. Not even that which was so strong within him, the duty of fulfilling a promise, could bring him to the work."

Up to the beginning of October, he went on with his official work, the lectures at South Kensington, the business as President of the Royal Society, and *ex officio* Trustee of the British Museum; the duties connected with the Inspectorship of Fisheries, the City and Guilds Technical Education Committee, and the University of London, and delivered the opening address at the London Hospital Medical School, on "The State and the Medical Profession" (*Coll. Ess.* iii. 323), his health meanwhile growing less and less satisfactory. He dropped minor offices, such as the Presidency of the National Association of Science Teach-



ers, which, he considered, needed more careful supervision than he was able to give, and meditated retiring from part at least of his main duties, when he was ordered abroad at a moment's notice for first one, then another, and yet a third period of two months. But he did not definitely retire until this rest had proved ineffectual to fit him again for active work.

The President of the Royal Society is, as mentioned above, an *ex officio* Trustee of the British Museum, so that now, as again in 1888, circumstances at length brought about the state of affairs which Huxley had once indicated—half-jestingly—to Robert Lowe, who inquired of him what would be the best course to adopt with respect to the Natural History collections of the British Museum:—"Make me a Trustee and Flower director." At this moment, the question of an official residence for the Director of the Natural History Museum was under discussion with the Treasury, and he writes:—

*Feb. 29, 1884.*

MY DEAR FLOWER—I am particularly glad to hear your news. "Ville qui parle et femme qui écoute se rendent," says the wicked proverb—and it is true of Chancellors of the Exchequer.—Ever yours very faithfully,

T. H. HUXLEY.

A pendent to this is a letter of congratulation to Sir Henry Roscoe on his knighthood:—

SCIENCE AND ART DEPARTMENT, S.K.,

*July 7, 1884.*

MY DEAR ROSCOE—I am very glad to see that the Government has had the grace to make some acknowledgment of their obligation to you, and I wish you and "my lady" long enjoyment of your honours. I don't know if you are gazetted yet, so I don't indicate them outside.—Ever yours very faithfully,

T. H. HUXLEY.

P.S.—I wrote some weeks ago to the Secretary of the National Association of Science Teachers to say that I must give up the Presidency. I had come to the conclusion that the Association wants sharp looking after, and that I can't undertake that business.

*P.S. 2.*—Shall I tell you what your great affliction henceforward will be? It will be to hear yourself called Sr'enary Roscoe by the flunkies who announce you.

Her Ladyship will please take note of this crumpled rose leaf—I am sure of its annoying her.

The following letter, with its comparison of life to a whirlpool and its acknowledgment of the widespread tendency in mankind to make idols, was written in answer to some enquiries from Lady Welby:—

*April 8, 1884.*

Your letter requires consideration, and I have had very little leisure lately. Whether motion disintegrates or integrates is, I apprehend, a question of conditions. A whirlpool in a stream may remain in the same spot for any imaginable time. Yet it is the effect of the motion of the particles of the water in that spot which continually integrate themselves into the whirlpool and disintegrate themselves from it. The whirlpool is permanent while the conditions last, though its constituents incessantly change. Living bodies are just such whirlpools. Matter sets into them in the shape of food,—sets out of them in the shape of waste products. Their individuality lies in the constant maintenance of a characteristic form, not in the preservation of material identity. I do not know anything about “vitality” except as a name for certain phenomena like “electricity” or “gravitation.” As you get deeper into scientific questions you will find that “Name ist Schall und Rauch” even more emphatically than Faust says it is in Theology. Most of us are idolators, and ascribe divine powers to the abstractions “Force,” “Gravity,” “Vitality,” which our own brains have created. I do not know anything about “inert” things in nature. If we reduce the world to matter and motion, the matter is not “inert,” inasmuch as the same amount of motion affects different kinds of matter in different ways. To go back to my own illustration. The fabric of the watch is not inert, every particle of it is in violent and rapid motion, and the winding-up simply perturbs the whole infinitely complicated system in a particular fashion. Equilibrium means death, because life is a succession of changes, while a changing equilibrium is a contradiction in terms. I am not at all clear that a living being is comparable to a machine running down. On this side of the question the whirlpool affords a better parallel than the watch. If you dam the stream above or below, the whirlpool dies; just as the living

being does if you cut off its food, or choke it with its own waste products. And if you alter the sides or bottom of the stream you may kill the whirlpool, just as you kill the animal by interfering with its structure. Heat and oxidation as a source of heat appear to supply energy to the living machine, the molecular structure of the germ furnishing the "sides and bottom of the stream," that is, determining the results which the energy supplied shall produce.

Mr. Ashby writes like a man who knows what he is talking about. His exposition appears to me to be essentially sound and extremely well put. I wish there were more sanitary officers of the same stamp. Mr. Spencer is a very admirable writer, and I set great store by his works. But we are very old friends, and he has endured me as a sort of "devil's-advocate" for thirty-odd years. He thinks that if I can pick no holes in what he says he is safe. But I pick a great many holes, and we agree to differ.

Between April and September, Fishery business took him out of London for no less than forty-three days, first to Cornwall, then in May to Brixham, in June to Cumberland and Yorkshire, in July to Chester, and in September to South Devon, Cornwall, and Wales. A few extracts from his letters home may be given. Just before starting, he writes from Marlborough Place to Rogate, where his wife and one of his daughters were staying:—

April 8.—The weather turned wonderfully muggy here this morning, and turned me into wet paper. But I contrived to make a "neat and appropriate" in presenting old Hird with his testimonial. Fayrer and I were students under him forty years ago, and as we stood together it was a question which was the greyest old chap.

April 14.—I have almost given up reading the Egyptian news, I am so disgusted with the whole business. I saw several pieces of land to let for building purposes about Falmouth, but did not buy any. (This was to twit his wife with her constant desire that he should buy a bit of land in the country to settle upon in their old age.)

April 18.—You don't say when you go back, so I direct this to Rogate. I shall expect to see you quite set up. We must begin to think seriously about getting out of the hurly-burly a

year or two hence, and having an Indian summer together in peace and quietness.

April 15, *Sunday, Falmouth*.—I went out at ten o'clock this morning, and did not get back till near seven. But I got a cup of tea and some bread and butter in a country village, and by the help of that and many pipes supported nature. There was a bitter east wind blowing, but the day was lovely otherwise, and by judicious dodging in coves and creeks and sandy bays, I escaped the wind and absorbed a prodigious quantity of sunshine.

I took a volume of the *Decline and Fall of the Roman Empire* with me. I had not read the famous 15th and 16th chapters for ages, and I lay on the sands and enjoyed them properly. A lady came and spoke to me as I returned, who knew L. at Oxford very well—can't recollect her name—and her father and mother are here, and I have just been spending an hour with them. Also a man who sat by me at dinner knew me from Jack's portrait. So my incognito is not very good. I feel quite set up by my day's wanderings.

May 11, *Torquay*.—We went over to Brixham yesterday to hold an inquiry, getting back here to an eight-o'clock or nearer nine dinner. . . . Dalhousie has discovered that the officer now in command of the *Britannia* is somebody whom he does *not* know, so he gave up going to Dartmouth and agreed to have a lazy day here. It is the most exquisite summer weather you can imagine, and I have been basking in the sun all the morning and dreamily looking over the view of the lovely bay which is looking its best—but take it all round it does not come up to Lynton. Dalhousie is more likeable than ever, and I am just going out for a stroll with him.

June 24.—I left Keswick this morning for Cockermouth, took the chair at my meeting punctually at twelve, sat six mortal hours listening to evidence, nine-tenths of which was superfluous—and turning my lawyer faculty to account in sifting the grains of fact out of the other tenth.

June 25, *Leeds*.— . . . We had a long drive to a village called Harewood on the Wharfe. There is a big Lord lives there—Earl of Harewood—and he and his ancestors must have taken great care of their tenants, for the labourers' houses are the best I ever saw. . . . I cut out the enclosed from the *Standard* the other day to amuse you, but have forgotten to send it before.\*

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\* Apparently announcing that he was about to accept a title. I have not been able to trace the paragraph.

I think we will be "Markishes," the lower grades are getting common.

June 27.— . . . I had a long day's inspection of the Wharfe yesterday, attended a meeting of the landed proprietors at Ottery to tell them what they must do if they would get salmon up their river. . . .

I shall leave here to-morrow morning, go on to Skipton, whence seven or eight miles' drive will take me to Linton where there is an obstruction in the river I want to see. In the afternoon I shall come home from Skipton, but I don't know exactly by what train. As far as I see, I ought to be home by about 10.30, and you may have something light for supper, as the "course of true feeding is not likely to run smooth"—to-morrow.

In August he went again to the corner of Surrey which he had enjoyed so much the year before. Here, in the intervals of suffering under the hands of the dentist, he worked at preparing a new edition of the Elementary Physiology with Sir M. Foster, alternating with fresh studies in critical theology.

The following letters reflect his occupations at this time, together with his desire, strongly combated by his friend, of resigning the Presidency of the Royal Society immediately.

HIGHCROFT HOUSE, MILFORD,  
GODALMING, Aug. 9, 1884.

MY DEAR FOSTER—I had to go up to town on Friday, and yesterday I went and had all my remaining teeth out, and came down here again with a shrewd suspicion that I was really drunk and incapable, however respectable I might look outwardly. At present I can't eat at all, and *I can't smoke with any comfort*. For once I don't mind using italics.

Item.—I send the two cuts.

Heaven be praised! I had brought down no copy of Physiology with me, so could not attend to your proof. Got it yesterday, so I am now at your mercy.

But I have gone over the proofs now, and send you a deuce of a lot of suggestions.

Just think over additions to smell and taste to bring these into harmony.

The Saints salute you. I am principally occupied in studying the Gospels.—Ever yours,  
T. H. HUXLEY.

HIGHCROFT HOUSE, MILFORD,  
GODALMING, Aug. 26, 1884.

DEARLY BELOVED—I have been going over the ear chapter this morning, and, as you will see, have suggested some additions. Those about the lamina spiralis are certainly necessary—*illus.* substitution of trihedral for triangular.\* I want also very much to get into heads of students that in sensation it is all modes of motion up to and in sensorium, and that the generation of feeling is the specific reaction of a particle of the sensorium when stimulated, just as contraction, etc., is the specific reaction of a muscular fibre when stimulated by its nerve. The psychologists make the fools of themselves they do because they have never mastered this elementary fact. But I am not sure whether I have put it well, and I wish you would give your mind to it. As for me I have not had much mind to give lately—a fortnight's spoon-meat reduced me to inanity, and I am only just picking up again. However, I walked ten miles yesterday afternoon, so there is not much the matter.

I will see what I can do with the histology business.† I wanted to re-write it, but I am not sure yet whether I shall be able.

Between ourselves, I have pretty well made up my mind to clear out of everything next year, R.S. included. I loathe the thought of wasting any more of my life in endless distractions—and so long as I live in London there is no escape for me. I have half a mind to live abroad for six months in the year.—  
Ever yours, T. H. H.

I enclose letter from Deutsch lunatic to go before Council and be answered by Foreign Secretary.

HIGHCROFT HOUSE, MILFORD,  
GODALMING, Aug. 29, 1884.

DEARLY BELOVED—I enclose the proofs, having mustered up volition enough to go over them at once. I think the alterations will be great improvements. I see you interpret yourself about the movements of the larynx.

As to the histology, I shall have a shot at it, but if I do not

\* On Sept. 8, he writes :—"I have been laughing over my 'trihedron.' It is a regular bull."

† "Most of our examinees" (he writes on Sept. 5) "have not a notion of what histology means at present. I think it will be good for other folks to get it into their heads that it is not all sections and carmine."

send you MS. in a week's time, go ahead. I am perplexed about the illustrations, but I see nothing for it but to have new ones in all the cases which you have marked. Have you anybody in Cambridge who can draw the things from preparations?

You are like Trochu with your "plan," and I am anxious to learn it. But have you reflected, 1st, that I am getting deafer and deafer, and that I cannot hear what is said at the council table and in the Society's rooms half the time people are speaking? and 2nd, that so long as I am President, so long must I be at the beck and call of everything that turns up in relation to the interests of science. So long as I am in the chair, I cannot be a *fainéant* or refuse to do anything and everything incidental to the position.

My notion is to get away for six months, so as to break with the "world, the flesh, and the devil" of London, for all which I have conceived a perfect loathing. Six months is long enough for anybody to be forgotten twice over by everybody but personal friends.

I am contemplating a winter in Italy, but I shall keep on my house for Harry's sake and as a *pied à terre* in London, and in the summer come and look at you at Burlington House, as the old soap-boiler used to visit the factory. I shall feel like the man out of whom the legion of devils departed when he looked at the gambades of the two thousand pigs going at express speed for the waters of Tiberias.

By the way, did you ever read that preposterous and immoral story carefully? It is one of the best attested of the miracles. . . .

When I have retired from the chair (which I must not scandalise) I shall write a lay sermon on the text. It will be impressive.

My wife sends her love, and says she has her eye on you. She is all for retirement.—Ever yours.

I am very sorry to hear of poor Mangles' death, but I suppose there was no other chance. T. H. H.

In September he hails with delight some intermission of the constant depression under which he has been labouring, and writes:—

So long as I sit still and write or read I am all right, otherwise not good for much, which is odd, considering that I eat, drink, and sleep like a top. I suppose that everybody starts with

a certain capital of life-stuff, and that expensive habits have reduced mine.

And again:—

I have been very shaky for the last few weeks, but I am picking up again, and hope to come up smiling for the winter's punishment.

There was nothing to drink last night, so I had some tea! with my dinner—smoked a pipe or two—slept better than usual, and woke without blue devils for the first time for a week!!! Query, is that the effect of tea or baccy? I shall try them again. We are fearfully and wonderfully made, especially in the stomach—which is altogether past finding out.

Still, his humour would flash out in the midst of his troubles; he writes in answer to a string of semi-official enquiries from Sir J. Donnelly:—

HIGHCROFT HOUSE, MILFORD, GODALMING.

SIR—In reply to your letter of the 9th Aug. (666), I have the honour to state—

1. That I am here.
2. That I have (*a*) had all my teeth out; (*b*) partially sprained my right thumb; (*c*) am very hot; (*d*) can't smoke with comfort; whence I may leave even official intelligence to construct an answer to your second inquiry.
3. Your third question is already answered under *2a*. Not writing might be accounted for by *2b*, but unfortunately the sprain is not bad enough—and "laziness, sheer laziness" is the proper answer.

I am prepared to take a solemn affidavit that I told you and Macgregor where I was coming many times, and moreover that I distinctly formed the intention of leaving my address in writing—according to those official instructions which I always fulfil.

If the intention was not carried out, its blood be upon its own head—I wash my hands of it, as Pilate did.

4. As to the question whether I *want* my letters I can sincerely declare that I don't—would in fact much rather not see them. But I suppose for all that they had better be sent.
5. I hope Macgregor's question is not a hard one—spoon-meat does not carry you beyond words of one syllable.



On Friday I signalised my last dinner for the next three weeks by going to meet the G.O.M. I sat next him, and he was as lively as a bird.

Very sorry to hear about your house. You will have to set up a van with a brass knocker and anchor on our common.—  
Ever yours, T. H. HUXLEY.

By the beginning of September he had made up his mind that he ought before long to retire from active life. The first person to be told of his resolution was the head of the Science and Art Department, with whom he had worked so long at South Kensington.

HIGHCROFT HOUSE, MILFORD, GODALMING,  
Sept. 3, 1884.

MY DEAR DONNELLY—I was very glad to have news of you yesterday. I gather you are thriving, notwithstanding the appalling title of your place of refuge. I should have preferred “blow the cold” to “Cold blow”—but there is no accounting for tastes.

I have been going and going to write to you for a week past to tell you of a notion that has been maturing in my mind for some time, and that I ought to let you know of before anybody else. I find myself distinctly aged—tired out body and soul, and for the first time in my life fairly afraid of the work that lies before me in the next nine months. Physically, I have nothing much to complain of except weariness—and for purely mental work, I think I am good for something yet. I am morally and mentally sick of society and societies—committees, councils—bother about details and general worry and waste of time.

I feel as if more than another year of it would be the death of me. Next May I shall be sixty, and have been thirty-one mortal years in my present office in the School. Surely I may sing my *nunc dimittis* with a good conscience. I am strongly inclined to announce to the Royal Society in November that the chair will be vacant that day twelvemonth—to resign my Government posts at midsummer, and go away and spend the winter in Italy—so that I may be out of reach of all the turmoil of London.

The only thing I don't like is the notion of leaving you without such support as I can give in the School. No one knows better than I do how completely it is your work and how gallantly you have borne the trouble and responsibility connected

with it. But what am I to do? I must give up all or nothing—and I shall certainly come to grief if I do not have a long rest.

Pray tell me what you think about it all.

My wife has written to Mrs. Donnelly and told her the news.  
—Ever yours very faithfully, T. H. HUXLEY.

Read Hobbes if you want to get hard sense in good English.

HIGHCROFT HOUSE, MILFORD, GODALMING,  
*Sept. 10, 1884.*

MY DEAR DONNELLY—Many thanks for your kind letter. I feel rather like a deserter, and am glad of any crumbs of comfort.

Cartwright has done wonders for me, and I can already eat most things (I draw the line at tough crusts). I have not even my old enemy, dyspepsia—but eat, drink, and sleep like a top.

And withal I am as tired as if I were hard at work, and shirk walking.

So far as I can make out there is not the slightest sign of organic disease anywhere, but I will get Clark to overhaul me when I go back to town. Sometimes I am inclined to suspect that it is all sham and laziness—but then why the deuce should I want to sham and be lazy.

Somebody started a charming theory years ago—that as you get older and lose volition, primitive evil tendencies, heretofore mastered, come out and show themselves. A nice prospect for venerable old gentlemen!

Perhaps my crust of industry is denuded, and the primitive rock of sloth is cropping out.

But enough of this egotistical invalidism.

How wonderfully Gordon is holding his own. I should like to see him lick the Mahdi into fits before Wolseley gets up. You despise the Jews, but Gordon is more like one of the Maccabees of Bar-Kochba than any sort of modern man.

My wife sends love to both of you, and says you are (in feminine language) “a dear thing in friends.”—Ever yours very faithfully,  
T. H. HUXLEY.

HOME OFFICE, *Sept. 18, 1884.*

MY DEAR DONNELLY—We have struck our camp at Milford, and I am going down to Devonshire and Cornwall to-morrow—partly on Fishery business, partly to see if I can shake myself straighter by change of air. I am possessed by seven devils—not

only blue, but of the deepest indigo—and I shall try to transplant them into a herd of Cornish swine.

The only thing that comforts me is Gordon's telegrams. Did ever a poor devil of a Government have such a subordinate before? He is the most refreshing personality of this generation.

I shall be back by 30th September—and I hope in better condition for harness than now.—Ever yours very faithfully,

T. H. HUXLEY.

Replying to General Donnelly's arguments against his resigning all his official posts, he writes:—

DARTMOUTH, *Sept.* 21, 1884.

MY DEAR DONNELLY—Your letters, having made a journey to Penzance (where I told my wife I should go last Friday, but did not, and brought up here instead) turned up this morning.

I am glad to have seen Lord Carlingford's letter, and I am very much obliged to him for his kind expressions. Assuredly I will not decide hastily.

Now for your letter—I am all for letters in these matters. Not that we are either of us "impatient and irritable listeners"—oh dear, no! "I have my faults," as the miser said, "but *avarice* is not one of them"—and we have our faults too, but notoriously they lie in the direction of long-suffering and apathy.

Nevertheless there is a good deal to be said for writing. *Mine* is itself a discipline in patience for my correspondent.

*Imprimis*. I scorn all your chaff about Society. My great object for years has been to keep out of it, not to go into it. Just you wait till the Misses Donnelly grow up—I trust there may be five or ten of them—and see what will happen to you. But apart from this, so long as I live in London, so long will it be practically impossible for me to keep out of dining and giving of dinners—and you know that just as well as I do.

2nd. I mean to give up the Presidency, but don't see my way to doing so next St. Andrew's Day. I wish I could—but I must deal fairly by the Society.

3rd. The suggestion of the holiday at Christmas is the most sensible thing you have said. I could get six weeks under the new arrangement (*Botany*, January and half February) without interfering with my lectures at all. But then there is the blessed Home Office to consider. There might be civil war between the net men and the rod men in six weeks, all over the country, without my mild influence.

4th. I must give up my Inspectorship. The mere thought of having to occupy myself with the squabbles of these idiots of country squireens and poachers makes me sick—and is, I believe, the chief cause of the morbid state of my mucous membranes.

All this week shall I be occupied in hearing one Jackass contradict another Jackass about questions which are of no importance.

I would almost as soon be in the House of Commons.

Now see how reasonable I am. I agree with you (*a*) that I must get out of the hurly-burly of society; (*b*) that I must get out of the Presidency; (*c*) that I must get out of the Inspectorship, or rather I agree with myself on that matter, you having expressed no opinion.

That being so, it seems to me that I must, willy-nilly, give up S.K. For—and here is the point you had in your mind when you lamented your possible impatience about something I might say—I swear by all the gods that are not mine, nothing shall induce me to apply to the Treasury for anything but the pound of flesh to which I am entitled.

Nothing ever disgusted me more than being the subject of a battle with the Treasury over the H.O. appointment—which I should have thrown up if I could have done so with decency to Harcourt.

It's just as well for me I couldn't, but it left a nasty taste.

I don't want to leave the School, and should be very glad to remain as Dean, for many reasons. But what I don't see is how I am to do that and make my escape from the thousand and one entanglements—which seem to me to come upon me quite irrespectively of any office I hold—or how I am to go on living in London as a (financially) decayed philosopher.

I really see nothing for it but to take my pension and go and spend the winter of 1885-86 in Italy. I hear one can be a regular swell there on £1000 a year.

Six months' absence is oblivion, and I shall take to a new line of work, and one which will greatly meet your approval.

As to X—— I am not a-going to—not being given to hopeless enterprises. That rough customer at Dublin is the only man who occurs to me. I can't think of his name, but that is part of my general unfitness.

. . . . I suppose I shall chaff somebody on my death-bed. But I am out of heart to think of the end of the lunches in the sacred corner.—Ever yours,

T. H. HUXLEY.

On the 21st he writes home about the steps he had begun to take with respect to giving up part of his official work.

I have had a long letter from Donnelly. He had told Lord Carlingford of my plans, and incloses a letter from Lord Carlingford to him, trusting I will not hastily decide, and with some pretty phrases about "support and honour" I give to the School. Donnelly is very anxious I should hold on to the School, if only as Dean, and wants me in any case to take two months' holiday at Christmas. Of course he looks on the R.S. as the root of all evil. Foster *per contra* looks on the School as the deuce, but would have me stick by the Royal Society like grim death.

The only moral obligation that weighs with me is that which I feel under, to deal fairly by Donnelly and the School. You must not argue against this, as rightly or wrongly I am certain that if I deserted the School hastily, or if I did not do all that I can to requite Donnelly for the plucky way in which he has stood by it and me for the last dozen years, I should never shake off the feeling that I had behaved badly. And as I am much given to brooding over my misdeeds, I don't want you to increase the number of my hell-hounds. You must help me in this . . . and if I am Quixotic, play Sancho for the nonce.

## CHAPTER VI

1884-85

TOWARDS the end of September he went to the West country to try to improve his health before the session began again in London. Thus he writes, on Sept. 26, to Mr. W. F. Collier, who had invited him to Horrabridge, and on the 27th to Sir M. Foster:—

FOWEY, *Sept.* 26, 1884.

Many thanks for the kind offer in your letter, which has followed me here. But I have not been on the track you might naturally have supposed I had followed. I have been trying to combine hygiene with business, and betook myself, in the first place, to Dartmouth, afterwards to Totnes, and then came on here. From this base of operations I could easily reach all my places of meeting. To-morrow I have to go to Bodmin, but I shall return here, and if the weather is fine (raining cats and dogs at present), I may remain a day or two to take in stock of fresh air before commencing the London campaign.

I am very glad to hear that your health has improved so much. You must feel quite proud to be such an interesting "case." If I set a good example myself I would venture to warn you against spending five shillings' worth of strength on the ground of improvement to the extent of half-a-crown.

I am not quite clear as to the extent to which my children have colonised Woodtown at present. But it seems to me that there must be three or four Huxleys (free or in combination, as the chemists say) about the premises. Please give them the paternal benediction; and with very kind remembrances to Mrs. Collier, etc.

FOWEY HOTEL, FOWEY, CORNWALL,

*Sept.* 27, 1884.

MY DEAR FOSTER—I return your proof, with a few trifling suggestions here and there. . . .

I fancy we may regard the award as practically settled, and a very good award it will be.

The address is beginning to loom in the distance. I have half a mind to devote some part of it to a sketch of the recent novelties in histology touching the nucleus question and molecular physiology.

My wife sent me your letter. By all means let us have a confabulation as soon as I get back and settle what is to be done with the "aged P."

I am not sure that I shall be at home before the end of the week. My lectures do not begin till next week, and the faithful Howes can start the practical work without me, so that if I find myself picking up any good in these parts, I shall probably linger here or hereabouts. But a good deal will depend on the weather—inside as well as outside. I am convinced that the prophet Jeremiah (whose works I have been studying) must have been a flatulent dyspeptic—there is so much agreement between his views and mine.—Ever yours,

T. H. HUXLEY.

But the net result of this holiday is summed up in a note, of October 5, to Sir M. Foster:—

I got better while I was in Cornwall and Wales, and, at present, I don't think there is anything the matter with me except a profound disinclination to work. I never before knew the proper sense of the term "vis inertix."

And writing in the same strain to Sir J. Evans, he adds:—

But I have a notion that if I do not take a long spell of absolute rest before long I shall come to grief. However, getting into harness again may prove a tonic—it often does, *e.g.* in the case of cab-horses.

Three days later he found himself ordered to leave England immediately, under pain of a hopeless breakdown.

4 MARLBOROUGH PLACE, Oct. 8, 1884.

MY DEAR FOSTER—We shall be very glad to see you on Friday. I came to the conclusion that I had better put myself in Clark's hands again, and he has been here this evening overhauling me for an hour.

He says there is nothing wrong except a slight affection of the liver and general nervous depression, but that if I go on the

latter will get steadily worse and become troublesome. He insists on my going away to the South and doing nothing but amuse myself for three or four months.

This is the devil to pay, but I cannot honestly say that I think he is wrong. Moreover, I promised the wife to abide by his decision.

We will talk over what is to be done.—Ever yours,

T. H. HUXLEY.

ATHENÆUM CLUB, Oct. 13, 1884.

MY DEAR MORLEY—I heartily wish I could be with you on the 25th, but it is *aliter visum* to somebody, whether Dis or Diabolis, I can't say.

The fact is, the day after I saw you I had to put myself in Clark's hands, and he ordered me to knock off work and go and amuse myself for three or four months, under penalties of an unpleasant kind.

So I am off to Venice next Wednesday. It is the only tolerably warm place accessible to any one whose wife will not let him go within reach of cholera just at present.

If I am a good boy I am to come back all sound, as there is nothing organic the matter; but I have had enough of the world, the flesh, and the devil, and shall extricate myself from that Trinity as soon as may be. Perhaps I may get within measurable distance of Berkeley (*English Men of Letters*, ed. J.M.) before I die!—Ever yours very faithfully,

T. H. HUXLEY.

ATHENÆUM CLUB, October 18, 1884.

MY DEAR FOSTER—Best thanks for your letter and route. I am giving you a frightful quantity of trouble; but, as the old woman (Irish) said to my wife, when she gave her a pair of my old trousers for her husband, "I hope it may be made up to ye in a better world."

She is clear, and I am clear, that there is no reason on my part for not holding on if the Society really wishes I should. But, of course, I must make it easy for the Council to get rid of a *fainéant* President, if they prefer that course.

I wrote to Evans an unofficial letter two days ago, and have had a very kind, straightforward letter from him. He is quite against my resignation. I shall see him this afternoon here. I had to go to my office (Fishery).



Clark's course of physic is lightening my abdominal troubles, but I am preposterously weak with a kind of shabby broken-down indifference to everything.—Ever yours,

T. H. H.

The "Indian summer"\* to which he looked forward was not to be reached without passing through a season of more than equinoctial storms and tempests. His career had reached its highest point only to be threatened with a speedy close. He himself did not expect more than two or three years' longer lease of life, and went by easy stages to Venice, where he spent eight days. "No place," he writes, "could be better fitted for a poor devil as sick in body and mind as I was when I got there."

Venice itself (he writes to Dr. Foster) just suited me. I chartered a capital gondolier, and spent most of my time exploring the Lagoons. Especially I paid a daily visit to the Lido, and filled my lungs with the sea air, and rejoiced in the absence of stinks. For Venice is like her population (at least the male part of it), handsome but odorous. Did you notice how handsome the young men are and how little beauty there is among the women?

I stayed eight days in Venice and then returned by easy stages first to Padua, where I wanted to see Giotto's work, then to Verona, and then here (Lugano). Verona delighted me more than anything I have seen, and we will spend two other days there as we go back.

As for myself, I really have no positive complaint now. I eat well and I sleep well, and I should begin to think I was malingering, if it were not for a sort of weariness and deadness that hangs about me, accompanied by a curious nervous irritability.

I expect that this is the upshot of the terrible anxiety I have had about my daughter M——.

I would give a great deal to be able to escape facing the wedding, for my nervous system is in the condition of that of a frog under opium.

But my R. must not go off without the paternal benediction.

For the first three weeks he was alone, his wife staying to make preparations for the third daughter's wedding on

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\* See page 74.

November 6th, for which occasion he was to return, afterwards taking her abroad with him. Unfortunately, just as he started, news was brought him at the railway station that his second daughter, whose brilliant gifts and happy marriage seemed to promise everything for her future, had been stricken by the beginnings of an insidious and, as he too truly feared, hopeless disease. Nothing could have more retarded his own recovery. It was a bitter grief, referred to only in his most intimate letters, and, indeed, for a time kept secret even from the other members of the family. Nothing was to throw a shade over the brightness of the approaching wedding.

But on his way home, he writes of that journey:—

I had to bear my incubus, not knowing what might come next, until I reached Luzern, when I telegraphed for intelligence, and had my mind set at ease as to the measures which were being adopted.

I am a tough subject, and have learned to bear a good deal without crying out; but those four-and-twenty hours between London and Luzern have taught me that I have yet a good deal to learn in the way of "grinning and bearing."

And although he writes, "I would give a good deal not to face a lot of people next week," . . . "I have the feelings of a wounded wild beast and hate the sight of all but my best friends," he hid away his feelings, and made this the occasion for a very witty speech, of which, alas! I remember nothing but a delightfully mixed polyglot exordium in French, German, and Italian, the result, he declared, of his recent excursion to foreign parts, which had obliterated the recollection of his native speech.

During his second absence he appointed his youngest daughter secretary to look after necessary correspondence, about which he forwarded instructions from time to time.

The chief matters of interest in the letters of this period are accounts of health and travel, sometimes serious, more often jesting, for the letters were generally written in the bright intervals between his dark days: business of the Royal Society, and the publication of the new edition of

the *Lessons in Elementary Physiology*, upon which he and Dr. Foster had been at work during the autumn. But the four months abroad were not productive of very great good; the weather was unpropitious for an invalid—"as usual, a quite unusual season"—while his mind was oppressed by the reports of his daughter's illness. Under these circumstances recovery was slow and travel comfortless; all the Englishman's love of home breaks out in his letter of April 8, when he set foot again on English soil.

HOTEL DE LONDRES, VERONA, *Nov. 18, 1884.*

DEAREST BABS—I. Why, indeed, do they ask for more? Wait till they send a letter of explanation, and then say that I am out of the country and not expected back for several years.

2. I wholly decline to send in any name to Athenæum. But don't mention it.

3. Society of Arts be bothered, also—.

4. Write to Science and Art Club to engage three of the prettiest girls as partners for the evening. They will look very nice as wallflowers.

5. Penny dinners? declined with thanks.

6. Ask the meeting of Herts N.H. Society to come here after next Thursday, when we shall be in Bologna.

Business first, my sweet girl secretary with the curly front; and now for private affairs, though as your mother is covering reams with them, I can only mention a few of the more important which she will forget.

The first is that she has a habit of hiding my shirts so that I am unable to find them when we go away, and the chambermaid comes rushing after us with the garment shamefully displayed.

The second is that she will cover all the room with her things, and I am obliged to establish a military frontier on the table.

The third is that she insists on my buying an Italian cloak. So you will see your venerable pater equipped in this wise.\* Except in these two particulars, she behaves fairly well to me.

In point of climate, so far, Italy has turned out a fraud. We dare not face Venice, and Mr. Fenili will weep over my defection; but that is better than that we should cough over his satisfaction.

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\* Sketch of a cloaked figure like a brigand of melodrama.

I am quite pleased to hear of the theological turn of the family. It must be a drop of blood from one of your eight great-grandfathers, for none of your ancestors that I have known would have developed in this way.

. . . Best love to Nettie and Harry. Tell the former that cabbages do *not* cost 5s. apiece, and the latter that 11 P.M. is the *clôture*.—Ever your affectionate  
PATER.

HOTEL BRITANNIQUE, NAPLES, *Nov. 30, 1884.*

MY DEAR FOSTER—Which being St. Andrew's Day, I think the expatriated P. ought to give you some account of himself.

We had a prosperous journey to Locarno, but there plumped into bitter cold weather, and got chilled to the bone as the only guests in the big hotel, though they did their best to make us comfortable. I made a shot at bronchitis, but happily failed, and got all right again.

Pallanza was as bad. At Milan temperature at noon 39° F., freezing at night. Verona much the same. Under these circumstances, we concluded to give up Venice and made for Bologna. There found it rather colder. Next Ravenna, where it snowed. However, we made ourselves comfortable in the queer hotel, and rejoiced in the mosaics of that sepulchral marsh.

At Bologna I had assurances that the Sicilian quarantine was going to be taken off at once, and as the reports of the railway travelling and hotels in Calabria were not encouraging, I determined to make for Naples, or rather, by way of extra caution, for Castellamare. All the way to Ancona the Apennines were covered with snow, and much of the plain also. Twenty miles north of Ancona, however, the weather changed to warm summer, and we rejoiced accordingly. At Foggia I found that the one decent hotel that used to exist was non-extant, so we went on to Naples.

Arriving at 10.30 very tired, got humbugged by a lying Neapolitan, who palmed himself off as the commissaire of the Hotel Bristol, and took us into an omnibus belonging to another hotel, that of the British being, as he said, "broke." After a drive of three miles or so got to the Bristol and found it shut up! After a series of adventures and a good deal of strong language on my part, knocked up the people here, who took us in, though the hotel was in reality shut up like most of those in Naples.\*

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\* Owing to the cholera and consequent dearth of travellers.

As usual the weather is "unusual"—hot in the sun, cold round the corner and at night. Moreover, I found by yesterday's paper that the beastly Sicilians won't give up their ten days' quarantine. So all chance of getting to Catania or Palermo is gone. I am not sure whether we shall stay here for some time or go to Rome, but at any rate we shall be here a week.

Dohrn is away getting subsidies in Germany for his new ship. We inspected the Aquarium this morning. Eisig and Mayer are in charge. Madame is a good deal altered in the course of the twelve years that have elapsed since I saw her, but says she is much better than she was.

As for myself, I got very much better when in North Italy in spite of the piercing cold. But the fatigue of the journey from Ancona here, and the worry at the end of it, did me no good, and I have been seedy for a day or two. However, I am picking up.

I see one has to be very careful here. We had a lovely drive yesterday out Pausilippo, but the wife got chilled and was shaky this morning. However, we got very good news of our daughter this evening, and that has set us both up.

My blessing for to-morrow will reach you after date. Let us hear how everything went off.

Your return in May project is really impracticable on account of the Fishery Report. I cannot be so long absent from the Home Office whatever I might manage with S.K.

With our love to Mrs. Foster and you—Ever yours very faithfully,  
T. H. HUXLEY.

This letter, as he says a week later, was written when he "was rather down in the mouth from the wretched old weather, and the wife being laid up with a bad cold," besides his own ailments.

I find I have to be very careful about night air, but nothing does me so much good as six or seven miles' walk between breakfast and lunch—at a good sharp pace. So I conclude that here cannot be much the matter, and yet I am always on the edge, so to speak, of that infernal hypochondria.

We have settled down here very comfortably, and I do not think we shall care to go any further south. Madame Dohrn and all the people at the stazione are very kind, and want to do all sorts of things for us. The other day we went in the launch to Capri, intending next day to go to Amalfi. But it threatened bad weather, so we returned in the evening. The journey

knocked us both up, and we had to get out of another projected excursion to Ischia to-day. The fact is, I get infinitely tired with talking to people and can't stand any deviation from regular and extremely lazy habits. Fancy my being always in bed by ten o'clock and breakfasting at nine!

On the 10th, writing to Sir John Evans, who as Vice-President, was acting in his stead at the Royal Society, he says:—

In spite of snow on the ground we had three or four days at Ravenna—which is the most interesting deadly lively sepulchre of a place I was ever in in my life. The evolution of modern from ancient art is all there in a nutshell. . . .

I lead an altogether animal life, except that I have renewed my old love for Italian. At present I am rejoicing in the Autobiography of that delightful sinner, Benvenuto Cellini. I have some notion that there is such a thing as science somewhere. In fact I am fitting myself for Neapolitan nobility.

#### TO HIS YOUNGEST DAUGHTER

HOTEL BRITANNIQUE, NAPLES, *Dec. 22, 1884.*

But we have had no letters from home for a week. . . . Moreover, if we don't hear to-day or to-morrow we shall begin to speculate on the probability of an earthquake having swallowed up 4 M. P. "with all the young barbarians at play—And I their sire trying to get a Roman holiday" (Byron). For we are going to Rome to-morrow, having had enough of Naples, the general effect of which city is such as would be produced by the sight of a beautiful woman who had not washed or dressed her hair for a month. Climate, on the whole, more variable than that of London.

We had a lovely drive three days ago to Cumae, a perfect summer's day; since then sunshine, heat, cold wind, calms all durcheinander, with thunder and lightning last night to complete the variety.

The thermometer and barometer are not fixed to the walls here, as they would be jerked off by the sudden changes. At first, it is odd to see them dancing about the hall. But you soon get used to it, and the porter sees that they don't break themselves.

With love to Nettie and Harry, and hopes that the pudding will be good—Ever your loving father, T. H. HUXLEY.

In January 1885 he went to Rome, whence he writes:—

HOTEL VICTORIA, VIA DEI DUE MACELLI,  
ROME, *Jan. 8, 1885.*

MY DEAR FOSTER—We have been here a fortnight very well lodged—south aspect, fireplace, and all the rest of the essentials except sunshine. Of this last there is not much more than in England, and the grey skies day after day are worthy of our native land. Sometimes it rains cats and dogs all day by way of a change—as on Christmas Day—but it is not cold. “Quite exceptional weather,” they tell us, but that seems to be the rule everywhere. We have done a respectable amount of gallery-laying, and I have been amusing myself by picking up the topography of ancient Rome. I was going to say Pagan Rome, but the inappropriateness of the distinction strikes me, papal Rome being much more stupidly and childishly pagan than imperial. I never saw a sadder sight than the kissing a wretched edified doll of a Bambino that went on in the Ara Coeli on Twelfth day. Your puritan soul would have longed to arise and slay. . . .

As to myself, though it is a very unsatisfactory subject and now I am very tired of bothering my friends about, I am like the farmer at the rent-dinner, and don't find myself much “forwarder.” That is to say, I am well for a few days and then all drift, and have to put myself right by dosing with Clark's pills, which are really invaluable. They will make me believe in those pills I saw advertised in my youth, and which among other things were warranted to cure “the indecision of juries.” I really can't make out my own condition. I walked seven or eight miles this morning over Monte Mario and out on the Campagna without any particular fatigue, and yesterday I was as miserable as an owl in sunshine. Something perhaps must be put down to the relapse which our poor girl had a week ago, and which became known to us in a terrible way. She had apparently quite recovered, and arrangements were made for their going abroad, and now everything is upset. I warned her husband that this was very likely, but did not sufficiently take the warning to myself.

You are taking a world of trouble for me, and Donnelly writes I am to do as I like so far as they are concerned. I have heard nothing from the Home Office, and I suppose it would be proper for me to write if I want any more leave. I really hardly know what to do. I can't say I feel very fit for the hurly-burly

of London just now, but I am not sure that the wholesomest thing for me would not be at all costs to get back to some engrossing work. If my poor girl were well, I could perhaps make something of the *dolce far niente*, but at present one's mind runs to her when it is not busy in something else.

I expect we shall be here a week or ten days more—at any rate, this address is safe—afterwards to Florence.

What am I to do in the Riviera? Here and at Florence there is always some distraction. You see the problem is complex.

My wife, who is very lively, thanks you for your letter (which I have answered) and joins with me in love to Mrs. Foster and yourself.—Ever yours,  
T. H. H.

Writing on the same day to Sir J. Evans, he proposed a considerable alteration in the duties of the Assistant Secretary of the Royal Society.

You know that I served a seven years' apprenticeship as Secretary, and that experience gave me very solid grounds for the conviction that, with the present arrangements, a great deal of the time of the Secretaries is wasted over the almost mechanical drudgery of proof-reading.

He suggests new arrangements, and proceeds:—

At the same time it would be very important to adopt some arrangements by which the *Transactions* papers can be printed independently of one another.

Why should not the papers be paged independently and be numbered for each year? Thus—"Huxley. Idleness and Incapacity in Italy. *Phil. Trans.* 1885. VI."

People grumble at the delay in publication, and are quite right in doing so, though it is impossible under the present system to be more expeditious, and it is not every senior secretary who would slave at the work as Stokes does. . . .

But it is carrying coals to Newcastle to talk of such business arrangements as these to you.

The only thing I am strong about, is the folly of going on cutting blocks with our Secretarial razors any longer.

I am afraid I cannot give a very good account of myself.

The truth of the answer to Mallock's question "Is life worth living?"—that depends on the liver—is being strongly enforced upon me in the hepatic sense of liver, and I must confess myself fit for very little. A week hence we shall migrate to Florence



and try the effect of the more bracing air. The Pincio is the only part of Rome that is fit to live in, and unfortunately the Government does not offer to build me a house there.

However, I have got a great deal of enjoyment out of ancient Rome—papal Rome is too brutally pagan (and in the worst possible taste too) for me.

### TO HIS DAUGHTER, MRS. ROLLER

*Jan. 11, 1885.*

We have now had nearly three weeks in Rome. I am sick of churches, galleries, and museums, and meanly make M—— go and see them and tell me about them. As we are one flesh, it is just the same as if I had seen them.

Since the time of Constantine there has been nothing but tawdry rubbish in the shape of architecture\*—the hopeless bad taste of the Papists is a source of continual gratification to me as a good Protestant (and something more). As for the skies, they are as changeable as those of England—the only advantage is the absence of frost and snow—(raining cats and dogs this Sunday morning).

But down to the time of Constantine, Rome is endlessly interesting, and if I were well I should like to spend some months in exploring it. As it is, I do very little, though I have contrived to pick up all I want to know about Pagan Rome and the Catacombs, which last are my especial weakness.

My master and physician is bothered a good deal with eczema—otherwise very lively. All the chief collections in Rome are provided with a pair of her spectacles, which she leaves behind. Several new opticians' shops are set up on the strength of the purchases in this line she is necessitated to make.

I want to be back at work, but I am horribly afraid I should be no good yet. We are thinking of going to Florence at the end of this week to see what the drier and colder air there will do.

With our dear love to you all—we are wae for a sight of you.—Ever your loving father,

T. H. HUXLEY.

HOTEL VICTORIA, VIA DEI DUE MACELLI,

*Jan. 16, 1885.*

MY DEAR FOSTER—It seems to me that I am giving my friends a word of trouble. . . .

I have had a bad week of it, and the night before last was

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\* For his appreciation of the great dome of the Pantheon, see p. 134.

under the impression that I was about to succumb shortly to a complication of maladies, and moreover, that a wooden box that my wife had just had made would cost thousands of pounds in the way of payment for extra luggage before we reached home. I do not know which hypochondriacal possession was the most depressing. I can laugh at it now, but I really was extraordinarily weak and ill.

We had made up our minds to bolt from Rome to Florence at once, when I suddenly got better, and to-day am all right. So as we hear of snow at Florence we shall stop where we are. It has been raining cats and dogs here, and the Tiber rose 40 feet and inundated the low grounds. But "*cantabit elevatus*"; it can't touch us, and at any rate the streets are washed clean.

The climate is mild here. We have a capital room and all the sunshine that is to be had, plus a good fire when needful, and at worst one can always get a breezy walk on the Pincio hard by.

However, about the leave. Am I to do anything or nothing? I am dying to get back to steady occupation and English food, and the sort of regimen one can maintain in one's own house. On the other hand, I stand in fear of the bitter cold of February and early March, and still more of the thousand and one worries of London outside one's work. So I suppose it will be better if I keep away till Easter, or at any rate to the end of March. But I must hear something definite from the H.O. I have written to Donnelly to the same effect. My poor Marian's relapse did not do us any good, for all that I expected it. However, the last accounts are very favourable.

I wrote to Evans the other day about a re-arrangement of the duties of the Secretary and Assistant Secretary. I thought it was better to write to him than to you on that subject, and I begged him to discuss the matter with the officers. It is quite absurd that Stokes and you should waste your time in press drudgery.

We are very prudent here, and the climate suits us both, especially my wife, who is so vigorous that I depute her to go and see the Palazzi, and tell me all about them when she comes back. Old Rome is endlessly interesting to me, and I can always potter about and find occupation. I think I shall turn antiquary—it's just the occupation for a decayed naturalist, though you need not tell the Treasurer I say so.

With our love to Mrs. Foster and yourself—Ever yours,  
T. H. H.

HOTEL VICTORIA, ROME, VIA DEI DUE MACELLI,  
Jan. 18, 1885.

MY DEAR DONNELLY — Official sentence of exile for two months more (up to May 12) arrived yesterday. So if my lords will be so kind as to concur I shall be able to disport myself with a clear conscience. I hope their lordships won't think that I am taking things too easy in not making a regular application, and I will do so if you think it better. But if it had rested with me I think I should have got back in February and taken my chance. That energetic woman that owns me, and Michael Foster, however, have taken the game out of my hands, and I have nothing to do but to submit.

On the whole I feel it is wise. I shall have more chance if I escape not only the cold but the bother of London for a couple of months more.

I was very bad a week ago, but I have taken to dosing myself with quinine, and either that or something else has given me a spurt for the last two days, so that I have been more myself than any time since I left, and begin to think that there is life in the old dog yet. If one could only have some fine weather! To-day there is the first real sunshine we have been favoured with for a week.

We are just back from a great function at St. Peter's. It is the festa of St. Peter's chair, and the ex-dragoon Cardinal Howard has been fogleman in the devout adorations addressed to that venerable article of furniture, which, as you ought to know, but probably don't, is inclosed in a bronze double and perched up in a shrine of the worst possible taste in the Tribuna of St. Peter's. The display of man-millinery and lace was enough to fill the lightest-minded woman with envy, and a general concert—some of the music very good—prevented us from feeling dull, while the *ci-devant* guardsman—big, burly, and bullet-headed—made God and then eat him.\* I must have a strong strain of Puritan blood in me somewhere, for I am possessed with a desire to arise and slay the whole brood of idolators whenever I assist at one of these ceremonies. You will observe that I am decidedly better, and have a capacity for a good hatred still.

The last news about Gordon is delightful. The chances are he will rescue Wolseley yet.

With our love—Ever yours,

T. H. HUNLEY.

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\* A reminiscence of Browning in "The Bishop Orders his Tomb":—

And then how I shall lie through centuries,  
And hear the blessed mutter of the mass,  
And see God made and eaten all day long.

## TO HIS ELDEST SON

ROME, *Jan. 20, 1885.*

I need hardly tell you that I find Rome wonderfully interesting, and the attraction increases the longer one stays. I am obliged to take care of myself and do but little in the way of sight-seeing, but by directing one's attention to particular objects one can learn a great deal without much trouble. I begin to understand Old Rome pretty well, and I am quite learned in the Catacombs, which suit me, as a kind of Christian fossils out of which one can reconstruct the body of the primitive Church. She was a simple maiden enough and vastly more attractive than the bedizened old harridan of the modern Papacy, so smothered under the old clothes of Paganism which she has been appropriating for the last fifteen centuries that Jesus of Nazareth would not know her if he met her.

I have been to several great papistical functions—among others to the festa of the Cathedra Petri in St. Peter's last Sunday, and I confess I am unable to understand how grown men can lend themselves to such elaborate tomfooleries—nothing but mere fetish worship—in forms of execrably bad taste, devised, one would think, by a college of ecclesiastical man-milliners for the delectation of school-girls. It is curious to notice that intellectual and æsthetic degradation go hand in hand. You have only to go from the Pantheon to St. Peter's to understand the great abyss which lies between the Roman of paganism and the Roman of the papacy. I have seen nothing grander than Agrippa's work—the popes have stripped it to adorn their own petrified lies, but in its nakedness it has a dignity with which there is nothing to compare in the ill-proportioned, worse decorated tawdry stone mountain on the Vatican.

The best thing, from an æsthetic point of view, that could be done with Rome would be to destroy everything except St. Paolo fuor le Mure, of later date than the fourth century.

But you will have had enough of my scrawl, and your mother wants to add something. She is in great force, and is gone prospecting to some Palazzo or other to tell me if it is worth seeing.—Ever your loving father,  
T. H. HUXLEY.

HOTEL VICTORIA, ROME, VIA DEI DUE MACELLI,  
*Jan. 25, 1885.*

MY DEAR DONNELLY—Best thanks for the telegram which arrived the day before yesterday and set my mind at ease.

I have been screwing up the old machine which I inhabit, first with quinine and now with a form of strychnia (which Clark told me to take) for the last week, and I have improved a good deal whether *post hoc* or *propter hoc* in the present uncertainty of medical science I decline to give any opinion.

The weather is very cold for Rome—ice an eighth of an inch thick in the Ludovisi Garden the other morning, and every night it freezes, but mostly fine sunshine in the day. (This is a remarkable sentence in point of grammar, but never mind.) The day before yesterday we came out on the Campagna, and it then was as fresh and bracing a breeze as you could get in North-umberland.

We are very comfortable and quiet here, and I hold on—till it gets warmer. I am told that Florence is detestable at present. As for London, our accounts make us shiver and cough.

News about the dynamiting gentry just arrived. A little more mischief and there will be an Irish massacre in some of our great towns. If an Irish Parnellite member were to be shot for every explosion I believe the thing would soon stop. It would be quite just, as they are practically accessories.

I think — would do it if he were Prime Minister. Nothing like a thorough Radical for arbitrary acts of power!

I must be getting better, as my disgust at science has ceased, and I have begun to potter about Roman geology and prehistoric work. You may be glad to learn that there is no evidence that the prehistoric Romans had Roman noses. But as I cannot find any particular prevalence of [them] among the modern—or ancient except for Cæsar—Romani, the fact is not so interesting as it might appear, and I would not advise you to tell — of it.

Behold a Goak—feeble, but promising of better things.

My wife unites with me with love to Mrs. Donnelly and yourself.—Ever yours,

T. H. HUXLEY.

The following letter refers to the fourth edition of the *Lessons in Elementary Physiology*, in the preparation of which Dr. Foster had been helping during the summer:—

HOTEL VICTORIA, ROME, VIA DEI DUE MACELLI,  
Feb. 1, 1885.

MY DEAR FOSTER—Anything more disgraceful than the way in which I have left your letter of more than a fortnight ago unanswered, I don't know. I thought the wife had written about the leave (and she thought I had, as she has told you) but I

knew I had not answered the questions about the title, still less considered the awful incubus ( $\times 10,000$  dinners by hepatic deep objection) of the preface.

There is such a thing as justice in this world—not much of it, but still some—and it is partly on that ground and partly because I want you, in view of future eventualities, to have a copyright in the book, that I proposed we should join our names.

Of course, if you would really rather not, for any good reason you may have, I have nothing further to say. But I don't think that the sentimental reason is a good one, and unless you have a better, I wish you would let the original proposal stand.

However, having stated the case afresh I leave it for you to say yes or no, and shall abide by your decision without further discussion.

As to the Preface. If I am to write it, please send me the old Preface. I think the book was published in 1864, or was it 1866? \* and it ought to be come of age or nearly so.

You might send me the histological chapter, not that I am going to alter anything, but I should like to see how it looks. I will knock the preface off at once, as soon as I hear from you.

The fact is, I have been much better in the course of the last few days. The weather has been very sunshiny but cool and bracing, and I have taken to quinine. Tried Clark's strychnine, but it did not answer so well.

I am in hopes that I have taken a turn for the better, and that there may yet be the making of something better than a growling hypochondriacal old invalid about me. But I am most sincerely glad that I am not obliged to be back 10 days hence—there is not much capital accumulated yet.

I find that the Italians have been doing an immense deal in prehistoric archæology of late years, and far more valuable work than I imagined. But it is very difficult to get at, and as Loescher's head man told me the other day when I asked for an Italian book published in Rome, "Well, you see it is so difficult to get Roman books in Rome."

I am ashamed to be here two months without paying my respects to the Lincei, and I am going to-day. The unaccountable creatures meet at 1 o'clock—lunch time!

Best love from my wife and self to Mrs. Foster and yourself.  
—Ever yours,

T. H. HUXLEY.

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\* In 1866.

ROME, Feb. 14, 1885.

MY DEAR FOSTER—*Voilà* the preface—a work of great labour! and which you may polish and alter as you like, *all but the last paragraph*. You see I have caved in. I like your asking to have your own way “for once.” My wife takes the same line, does whatever she pleases, and then declares I leave her no initiative.

If I talk of public affairs, I shall simply fall a-blaspheming. I see the *Times* holds out about Gordon, and does not believe he is killed. Poor fellow! I wish I could believe that his own conviction (as he told me) is true, and that death only means a larger government for him to administer. Anyhow, it is better to wind up that way than to go growling out one’s existence as a ventose hypochondriac, dependent upon the condition of a few square inches of mucous membrane for one’s heaven or hell.

As to private affairs, I think I am getting solidly, but very slowly, better. In fact, I can’t say there is much the matter with me, except that I am weaker than I ought to be, and that a sort of weary indolence hangs about me like a fog. M—— is wonderfully better, and her husband has taken a house for them at Norwood. If I could be rejoiced at anything, I should be at that; but it seems to me as if since that awful journey when I first left England, “the springs was broke,” as that vagabond tout said at Naples.

It has turned very cold here, and we are uncertain when to leave for Florence, but probably next week. The Carnival is the most entirely childish bosh I have ever met with among grown people. Want to finish this now for post, but will write again speedily. Moseley’s proposition is entirely to my mind, and I have often talked of it. The R.S. rooms ought to be house-of-call and quasi-club for all F.R.S. in London.

Wife is bonny, barring a cold. It is as much as I can do to prevent her sporting a mask and domino!

With best love—Ever yours,

T. H. H.

HOTEL VICTORIA, ROME, VIA DEI DUE MACELLI,  
Feb. 16, 1885.

MY DEAR DONNELLY—I have had it on my mind to write to you for the last week—ever since the hideous news about Gordon reached us. But partly from a faint hope that his wonderful fortune might yet have stood him in good stead, and partly because there is no great satisfaction in howling with rage, I have abstained.

Poor fellow! I wonder if he has entered upon the "larger sphere of action" which he told me was reserved for him in case of such a trifling accident as death. Of all the people whom I have met with in my life, he and Darwin are the two in whom I have found something bigger than ordinary humanity—an unequalled simplicity and directness of purpose—a sublime unselfishness.

Horrible as it is to us, I imagine that the manner of his death was not unwelcome to himself. Better wear out than rust out, and better break than wear out. The pity is that he could not know the feeling of his countrymen about him.

I shall be curious to see what defence the superingenious Premier has to offer for himself in Parliament. I suppose, as usual, the question will drift into a brutal party fight, when the furious imbecility of the Tories will lead them to spoil their case. That is where we are; on the one side, timid imbecility "waiting for instructions from the constituencies"; furious imbecility on the other, looking out for party advantage. Oh! for a few months of William Pitt.

I see you think there may be some hope that Gordon has escaped yet. I am afraid the last telegram from Wolseley was decisive. We have been watching the news with the greatest anxiety, and it has seemed only to get blacker and blacker.

[Touching a determined effort to alter the management of certain Technical Education business.]

I trust he may succeed, and that the unfitness of these people to be trusted with anything may be demonstrated. I regret I am not able to help in the good work. Get the thing out of their hands as fast as possible. The prospect of being revenged for all the beastly dinners I sat out and all the weary discussions I attended to on purpose, really puts a little life into me. Apropos of that, I am better in various ways, but curiously weak and washed out; and I am afraid that not even the prospect of a fight would screw me up for long. I don't understand it, unless I have some organic disease of which nobody can find any trace (and in which I do not believe myself), or unless the terrible trouble we have had has accelerated the advent of old age. I rather suspect that the last speculation is nearest the truth. You will be glad to hear that my poor girl is wonderfully better, and, indeed, to all appearance quite well. They are living quietly at Norwood.

I shall be back certainly by the 12th April, probably before.



We have found very good quarters here, and have waited for the weather to get warmer before moving; but at last we have made up our minds to begin nomadising again next Friday. We go to Florence, taking Siena, and probably Pisa, on our way, and reaching Florence some time next week. Address—Hotel Milano, Via Cerretani.

For the last week the Carnival has been going on. It strikes me as the most elaborate and dreariest tomfoolery I have ever seen, but I doubt if I am in the humour to judge it fairly. It is only just to say that it entertains my vigorous wife immensely. I have been expecting to see her in mask and domino, but happily this is the last day, and there is no sign of any yet. I have never seen any one so much benefited by rest and change as she is, and that is a good thing for both of us.

After Florence we shall probably make our way to Venice, and come home by the Lago di Garda and Germany. But I will let you know when our plans are settled.

With best love from we two to you two—Ever yours,

T. H. HUXLEY.

#### TO HIS YOUNGEST DAUGHTER

SIENA, *Feb.* 23, 1885.

DEAREST ETHEL—The cutting you sent me contains one of the numerous “goaks” of a Yankee performing donkey who is allowed to disport himself in one of the New York papers. I confess it is difficult to see the point of the joke, but there is one if you look close. I don’t think you need trouble to enlighten the simple inquirer. He probably only wanted the indignant autograph which he won’t get.

The Parker Museum must take care of itself. The public ought to support it, not the men of science.

As a grandfather, I am ashamed of my friends who are of the same standing; but I think they would take it as a liberty if, in accordance with your wish, I were to write to expostulate.

After your mother had exhausted the joys of the Carnival, she permitted me to leave Rome for this place, where we arrived last Friday evening. My impression is that if we had stayed in Rome much longer we should never have left. There is something idle and afternoony about the air which whittles away one’s resolution.

The change here is wonderfully to the good. We are perched more than a thousand feet above the sea, looking over

the Tuscan hills for twenty or thirty miles every way. It is warm enough to sit with the window wide open and yet the air is purer and more bracing than in any place we have visited. Moreover, the hotel (*Grande Albergo*) is very comfortable.

Then there is one of the most wonderful cathedrals to be seen in all North Italy—free from all the gaudy finery and atrocious bad taste which have afflicted me all over South Italy. The town is the quaintest place imaginable—built of narrow streets on several steep hills to start with, and then apparently stirred up with a poker to prevent monotony of effect.

Moreover, there is Catherine of Siena, of whom I am reading a delightful Catholic life by an Italian father of the Oratory. She died 500 years ago, but she was one of twenty-five children, and I think some of them must have settled in Kent and allied themselves with the Heathorns. Otherwise, I don't see why her method of writing to the Pope should have been so much like the way my daughters (especially the youngest) write to their holy father.

I wish she had not had the stigmata—I am afraid there must have been a *leetle* humbug about the business—otherwise she was a very remarkable person, and you need not be ashamed of the relationship.

I suppose we shall get to Florence some time this week; the address was sent to you before we left Rome—Hotel Milano, Via Cerretti. But I am loth to leave this lovely air in which, I do believe, I am going to pick up at last. The misfortune is that we did not intend to stay here more than three days, and so had letters sent to Florence. Everybody told us it would be very cold, and, as usual, everybody told taradiddles.

M. unites in fondest love to you all.—Ever your loving father,  
T. H. HUXLEY.

### TO HIS SON

SIENA, *Feb.* 25, 1885.

. . . If you had taken to physical science it would have been delightful to me for us to have worked together, and I am half inclined to take to history that I may earn that pleasure. I could give you some capital wrinkles about the physical geography and prehistoric history (excuse bull) of Italy for a Roman History primer! Joking apart, I believe that history might be, and ought to be, taught in a new fashion so as to make the meaning of it as a process of evolution—intelligible to the young. The Italians have been doing wonders in the last twenty years in

prehistoric archæology, and I have been greatly interested in acquainting myself with the general results of their work.

We moved here last Friday, and only regret that the reports of the weather prevented us from coming sooner. More than 1000 ft. above the sea, in the midst of a beautiful hill country, and with the clearest and purest air we have met with in Italy, Siena is perfectly charming. The window is wide open and I look out upon a vast panorama, something like that of the Surrey hills, only on a larger scale—"Raw Siena," "Burnt Siena," in the foreground, where the colour of the soil is not hidden by the sage green olive foliage, purple mountains in the distance.

The old town itself is a marvel of picturesque crookedness, and the cathedral a marvel. M. and I have been devoting ourselves this morning to St. Catarina and Sodoma's pictures.

I am reading a very interesting life of her by Capeceletro, and, if my liver continues out of order, may yet turn Dominican.

However, the place seems to be doing me good, and I may yet, like another person, decline to be a monk.

#### TO HIS DAUGHTER, MRS. ROLLER

*March 8.*

The great merit of Rome is that you have never seen the end of it. M. and I have not worked very hard at our galleries and churches, but I have got so far as a commencing dislike for the fine arts generally. Perhaps after a week or two I shall take to science out of sheer weariness.

HOTEL DE MILANO, FLORENCE, *March 12, 1885.*

MY DEAR FOSTER—My wife and I send you our hearty good wishes (antedated by four days). I am not sure we ought not to offer our best thanks to your mother for providing us with as staunch a friend as people ever were blessed with. It is possible that she did not consider that point nine and forty years ago; but we are just as grateful as if she had gone through it all on our own account.

We start on our way homeward to-morrow or next day, by Bologna to Venice, and then to England by the way we came—taking it easy. The Brenner is a long way round and I hear very cold. I think we may stay a few days at Lugano, which I liked very much when there before. Florence is very charming, but there is not much to be said for the climate. My wife has been bothered with sore throat, to which she is especially liable,

ever since we have been here. Old residents console her with the remark that Florentine sore throat is a regular thing in the spring. The alternations of heat and cold are detestable. So we stand thus—*Naples*, bad for both—*Rome*, good for her, bad for me—*Florence*, bad for her, baddish for me. Venice has to be tried, but stinks and mosquitoes are sure to render it impossible as soon as the weather is warm. Siena is the only place that suited both of us, and I don't think that would exactly answer to live in. Nothing like foreign travel for making one content with home.

I shall have to find a country lot suited to my fortunes when I am paid off. Couldn't you let us have your gardener's cottage? My wife understands poultry and I shall probably have sufficient strength to open the gate and touch my hat to the Dons as they drive up. I am afraid E. is not steady enough for waiting-maid or I would offer her services.

. . . I am rejoiced to hear that the lessons and the questions are launched. They loom large to me as gigantic undertakings, in which a dim and speculative memory suggests I once took part, but probably it is a solar myth, and I am too sluggish to feel much compunction for the extra trouble you have had.

Perhaps I shall revive when my foot is on my native heath in the shady groves of the Evangelist.\*

My wife is out photograph hunting—nothing diminishes her activity—otherwise she would join in love and good wishes to Mrs. Foster and yourself.—Ever yours, T. H. HUXLEY.

The two worst and most depressing periods of this vain pilgrimage in pursuit of health, were the stay at Rome and at Florence. At the latter town he was inexpressibly ill and weak; but his daily life was brightened by the sympathy and active kindness of Sir Spencer Walpole, who would take him out for short walks, talking as little as possible, and shield him from the well-meant but tactless attentions of visitors who would try to "rouse him and do him good" by long talks on scientific questions.

His physical condition, indeed, was little improved.

As for my unsatisfactory carcase (he writes on March 6, to Sir J. Donnelly), there seems nothing the matter with it now except that the brute objects to work. I eat well, drink well,

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\* St. John's Wood.

sleep well, and have no earthly ache, pain or discomfort. I can walk for a couple of hours or more without fatigue. But half an hour's talking wearies me inexpressibly, and "saying a few words," would finish me for the day. For all that, I do not mean to confess myself finally beaten till I have had another try.

That is to say, he was still bent upon delivering his regular course of lectures at South Kensington as soon as he returned, in spite of the remonstrances of his wife and his friends.

In the same letter he contrasts Florence with Siena and its "fresh, elastic air," its "lovely country that reminds one of a magnified version of the Surrey weald." The Florentine climate was trying.\* "And then there is the awful burden of those miles of 'treasures of art.'" He had been to the Uffizii; "and there is the Pitti staring me in the face like drear fate. Why can't I have the moral courage to come back and say I haven't seen it? I should be the most distinguished of men."

There is another reference to Gordon:—

What an awful muddle you are all in in the bright little, tight little island. I hate the sight of the English papers. The only good thing that has met my eye lately is a proposal to raise a memorial to Gordon. I want to join in whatever is done, and unless it will be time enough when I return, I shall be glad if you will put me down for £5 to whatever is the right scheme.

The following to his daughter, Mrs. Roller, describes the stay in Florence.

HOTEL DE MILANO, FLORENCE, *March 7, 1885.*

We have been here more than a week and have discovered two things, first that the wonderful "art treasures," of which

\* A week later he writes to Sir J. Evans—"I begin to look forward with great satisfaction to the equability of English weather—to that dear little island where doors and windows shut close—where fires warm without suffocating—where the chief business of the population in the streets is something else than expectoration—and where I shall never see fowl with salad again.

"You perceive I am getting better by this prolonged growl. . . . But half an hour's talking knocks me up, and I am such an effete creature that I think of writing myself p. R. S. with a small p."

all the world has heard, are a sore burden to the conscience if you don't go to see them, and an awful trial to the back and legs if you do; and thirdly, that the climate is productive of a peculiar kind of relaxed throat. M.'s throat discovered it, but on enquiry, it proved to be a law of nature, at least, so the oldest inhabitants say. We called on them to-day.

But it is a lovely place for all that, far better than Rome as a place to live in, and full of interesting things. We had a morning at the Uffizii the other day, and came back with minds enlarged and backs broken. To-morrow we contemplate attacking the Pitti, and doubt not the result will be similar. By the end of the week our minds will probably [be] so large, and the small of the back so small that we should probably break if we stayed any longer, so think it prudent to be off to Venice. Which Friday is the day we go, reaching Venice Saturday or Sunday. Pension Suisse, Canal Grande, as before. And mind we have letters waiting for us there, or your affectionate Pater will emulate the historical "cocky."

I got much better at Siena, probably the result of the medicinal nature of the city, the name of which, as a well-instructed girl like you knows, is derived from the senna, which grows wild there, and gives the soil its peculiar pigmentary character.

But unfortunately I forgot to bring any with me, and the effect went off during the first few days of our residence here, when I was, as the Italians say, "molto basso nel bocca." However I am picking up again now, and if people wouldn't call upon us, I feel there might be a chance for me.

I except from that remark altogether the dear Walpoles who are here and as nice as ever. Mrs. Walpole's mother and sister live here, and the W.'s are on a visit to them but leave on Wednesday. They go to Venice, but only for two or three days.

We shall probably stay about a fortnight in Venice, and then make our way back by easy stages to London. We are wae to see you all again.

Doctor M—— [Mrs. Huxley] has just been called in to a case of sore throat in the person of a young lady here, and is quite happy. The young lady probably will not be, when she finds herself converted into a sort of inverted mustard-pot, with the mustard outside! She is one of a very nice family of girls, who (by contrast) remind us of our own.—Ever your loving  
(to all) father,  
PATER.

Mrs. M—— has just insisted on seeing this letter.

## TO HIS YOUNGEST DAUGHTER

HOTEL BEAU SÉJOUR, SAN REMO, *March 30, 1885.*

DEAREST BABS—We could not stand “beautiful Venice the pride of the sea” any longer. It blew and rained and colded for eight-and-forty hours consecutively. Everybody said it was a most exceptional season, but that did not make us any warmer or prevent your mother from catching an awful cold. So as soon as she got better we packed up and betook ourselves here by way of Milan and Genoa. At Milan it was so like London on a wet day, that except for the want of smoke we might have been in our dear native land. At Genoa we arrived late one afternoon and were off early in the morning—but by dint of taking a tram after dinner (not a dram) and going there and back again we are able to say we have seen that city of palaces. The basements we saw through the tram windows by mixed light of gas and moon may in fact all have belonged to palaces. We are not in a position to say they did not.

The quick train from Genoa here is believed to go fully twenty-five miles an hour, but starts at 7 A.M., but the early morning air being bad for the health, we took the slow train at 9.30, and got here some time in the afternoon. But mind you it is a full eighty miles, and when we were at full speed between the stations—very few donkeys could have gone faster. But the coast scenery is very pretty, and we didn't mind.

Here we are very well off and as nearly warm as I expect to be before reaching England. You can sit out in the sun with satisfaction, though there is a little knife-edge of wind just to remind us of Florence. Everybody, however, tells us it is quite an exceptional season, and that it ought to be the most balmy air imaginable. Besides there are no end of date-palms and cactuses and aloes and odorous flowers in the garden—and the loveliest purple sea you can imagine.

Well, we shall stop some days and give San Remo a chance—at least a week, unless the weather turns bad.

As to your postcards which have been sent on from Venice and are really shabby, I am not going to any dinners whatsoever, either Middle Temple or Academy. Just write to both that “Mr. H. regrets he is unable to accept the invitation with which — have honoured him.”\*

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\* “It's like putting the shutters up,” he said sadly to his wife, when he felt unable to attend the Royal Academy dinner as he had done for many years.

I have really nothing the matter with me now—but my stock of strength is not great, and I can't afford to spend any on dinners.

The blessedest thing now will be to have done with the nomadic life of the last five months—and see your ugly faces (so like their dear father) again. I believe it will be the best possible tonic for me.

M—— has not got rid of her cold yet, but a few warm days here will, I hope, set her up.

I met Lady Whitworth on the esplanade to-day—she is here with Sir Joseph, and this afternoon we went to call on her. The poor old man is very feeble and greatly altered since I saw him last.

Write here on receiving this. We shall take easy stages home, but I don't know that I shall be able to give you any address.

M—— sends heaps of love to all (including Charles\*)—  
Ever your loving father, T. H. HUXLEY.

Tell the "Micropholis" man that it is a fossil lizard with an armour of small scales.

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\* The cat.



## CHAPTER VII

1885

ON April 8, he landed at Folkestone, and stayed there a day or two before going to London. Writing to Sir J. Donnelly, he remarks with great satisfaction at getting home:—

We got here this afternoon after a rather shady passage from Boulogne, with a strong north wind in our teeth all the way, and rain galore. For all that, it is the pleasantest journey I have made for a long time—so pleasant to see one's own dear native mud again. There is no foreign mud to come near it.

And on the same day he sums up to Sir M. Foster the amount of good he has gained from his expedition, and the amount of good any patient is likely to get from travel:—

As for myself I have nothing very satisfactory to say. By the oddest chance we met Andrew Clark in the boat, and he says I am a very bad colour—which I take it is the outward and visible sign of the inward and carnal state. I may sum that up by saying that there is nothing the matter but weakness and indisposition to do anything, together with a perfect genius for making mountains out of molehills.

After two or three fine days at Venice, we have had nothing but wet or cold—or hot and cold at the same time, as in that prodigious imposture the Riviera. Of course it was the same story everywhere, “perfectly unexampled season.”

*Moral.*—If you are perfectly well and strong, brave Italy—but in search of health stop at home.

It has been raining cats and dogs, and Folkestone is what

some people would call dreary. I could go and roll in the mud with satisfaction that it is English mud.

It will be jolly to see you again. Wife unites in love.—Ever yours,  
T. H. HUXLEY.

To return home was not only a great pleasure; it gave him a fillip for the time, and he writes to Sir M. Foster, April 12:—

It is very jolly to be home, and I feel better already. Clark has just been here overhauling me, and feels very confident that he shall screw me up.

I have renounced dining out and smoking (!!!) by way of preliminaries. God only knows whether I shall be permitted more than the smell of a mutton chop for dinner. But I have great faith in Andrew, who set me straight before when other "physicians' aid was vain."

But his energy was fitful; lassitude and depression again invaded him. He was warned by Sir Andrew Clark to lay aside all the burden of his work. Accordingly, early in May, just after his sixtieth birthday, he sent in his formal resignation of the Professorship of Biology, and the Inspectorship of Salmon Fisheries; while a few days later he laid his resignation of the Presidency before the Council of the Royal Society. By the latter he was begged to defer his final decision, but his health gave no promise of sufficient amendment before the decisive Council meeting in October.

He writes on May 27:—

I am convinced that what with my perennial weariness and my deafness I ought to go, whatever my kind friends may say.

A curious effect of his illness was that for the first time in his life he began to shrink involuntarily from assuming responsibilities and from appearing on public occasions; thus he writes on June 16:—

I am sorry to say that the perkiness of last week \* was only a spurt, and I have been in a disgusting state of blue devils lately. Can't make out what it is, for I really have nothing the matter,

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\* *i.e.* at the unveiling of the Darwin statue at South Kensington. See p. 120.

except a strong tendency to put the most evil construction upon everything.

I am fairly dreading to-morrow [*i.e.* receiving the D.C.L. degree at Oxford\*] but why I don't know—probably an attack of modesty come on late in life and consequently severe.

Very likely it will do me good and make me "fit" for Thursday [*i.e.* Council and ordinary meetings of Royal Society].

And a month later:—

I have been idling in the country for two or three days—but like the woman with the issue, "I am not better but rather worse"—blue devils and funk—funk and blue devils. Liver, I expect. [An ailment of which he says to Prof. Marsh, "I rather wish I had some respectable disease—it would be livelier."]

And again:—

Everybody tells me I look so much better, that I am really ashamed to go growling about, and confess that I am continually in a blue funk and hate the thought of any work—especially of scientific or anything requiring prolonged attention.

At the end of July he writes to Sir W. Flower—

4 MARLBOROUGH PLACE, July 27, 1885.

MY DEAR FLOWER—I am particularly glad to hear that things went right on Saturday, as my conscience rather pricked me for my desertion of the meeting.† But it was the only chance we had of seeing our young married couple before the vacation—and you will rapidly arrive at a comprehension of the cogency of *that* argument now.

I will think well of your kind words about the Presidency. If I could only get rid of my eternal hypochondria the work of the R.S. would seem little enough. At present, I am afraid of everything that involves responsibility to a degree that is simply ridiculous. I only wish I could shirk the inquiries I am going off to hold in Devonshire!

P.R.S. in a continual blue funk is not likely to be either dignified or useful; and unless I am in a better frame of mind in October I am afraid I shall have to go.—Ever yours very faithfully,

T. H. HUXLEY.

A few weeks at Filey in August did him some good at first; and he writes cheerfully of his lodgings in "a place

\* See p. 118.

† British Museum Trustees, July 25.

with the worst-fitting doors and windows, and the hardest chairs, sofas, and beds known to my experience."

He continues:—

I am decidedly picking up. The air here is wonderful, and as we can set good cookery against hard lying (I don't mean in the Munchausen line) the consequent appetite becomes a mild source of gratification. Also, I have not met with more than two people who knew me, and that in my present state is a negative gratification of the highest order.

Later on he tried Bournemouth; being no better, he thought of an entirely new remedy.

The only thing I am inclined to do is to write a book on Miracles. I think it might do good and unload my biliary system.

In this state of indecision, so unnatural to him, he writes to Sir M. Foster:—

I am anything but clear as to the course I had best take myself. While undoubtedly much better in general health, I am in a curious state of discouragement, and I should like nothing better than to remain buried here (Bournemouth) or anywhere else, out of the way of trouble and responsibility. It distresses me to think that I shall have to say something definite about the Presidency at the meeting of Council in October.

Finally on October 20, he writes:—

I think the lowest point of my curve of ups and downs is gradually rising—but I have by no means reached the point when I can cheerfully face anything. I got over the Board of Visitors (two hours and a half) better than I expected, but my deafness was a horrid nuisance.

I believe the strings of the old fiddle will tighten up a good deal, if I abstain from attempting to play upon the instrument at present—but that a few jigs now will probably ruin that chance.

But I will say my final word at our meeting next week. I would rather step down from the chair than dribble out of it. Even the devil is in the habit of departing with a "melodious twang," and I like the precedent.

So at the Anniversary meeting on November 30, he definitely announced in his last Presidential address his

resignation of that "honourable office" which he could no longer retain "with due regard to the interests of the Society, and perhaps, I may add, of self-preservation."

I am happy to say (he continued) that I have good reason to believe that, with prolonged rest—by which I do not mean idleness, but release from distraction and complete freedom from those lethal agencies which are commonly known as the pleasures of society—I may yet regain so much strength as is compatible with advancing years. But in order to do so, I must, for a long time yet, be content to lead a more or less anchoritic life. Now it is not fitting that your President should be a hermit, and it becomes me, who have received so much kindness and consideration from the Society, to be particularly careful that no sense of personal gratification should delude me into holding the office of its representative one moment after reason and conscience have pointed out my incapacity to discharge the serious duties which devolve upon the President, with some approach to efficiency.

I beg leave, therefore, with much gratitude for the crowning honour of my life which you have conferred upon me, to be permitted to vacate the chair of the Society as soon as the business of this meeting is at an end.

The settlement of the terms of the pension upon which, after thirty-one years of service under Government, he retired from his Professorship at South Kensington and the Inspectorship of Fisheries, took a considerable time. The chiefs of his own department, that of Education, wished him to retire upon full pay, £1500 (see p. 21). The Treasury were more economical. It was the middle of June before the pension they proposed of £1200 was promised; the end of July before he knew what conditions were attached to it.

On June 20, he writes to Mr. Mundella, Vice-President of the Council:—

MY DEAR MUNDELLA—Accept my warmest thanks for your good wishes, and for all the trouble you have taken on my behalf. I am quite ashamed to have been the occasion of so much negotiation.

Until I see the Treasury letter, I am unable to judge what

the £1200 may really mean,\* but whatever the result, I shall never forget the kindness with which my chiefs have fought my battle.—I am, yours very faithfully,  
T. H. HUXLEY.

On July 16, he writes to Sir M. Foster:—

The blessed Treasury can't make up their minds whether I am to be asked to stay on as Dean or not, and till they do, I can't shake off any of my fetters.

Early in the year he had written to Sir John Donnelly of the necessity of resigning:—

Nevertheless (he added), it will be a sad day for me when I find myself no longer entitled to take part in the work of the schools in which you and I have so long been interested.

But that "sad day" was not to come yet. His connection with the Royal College of Science was not entirely severed. He was asked to continue, as Honorary Dean, a general supervision of the work he had done so much to organise, and he kept the title of Professor of Biology, his successors in the practical work of the chair being designated Assistant Professors.

"I retain," he writes, "general superintendence as part of the great unpaid."

It is a comfort (he writes to his son), to have got the thing settled. My great desire at present is to be idle, and I am now idle with a good conscience.

Later in the year, however, a change of Ministry having taken place, he was offered a Civil List Pension of £300 a year by Lord Iddesleigh. He replied accepting it:—

4 MARLBOROUGH PLACE, *Nov.* 24, 1885.

MY DEAR LORD IDDESLEIGH—Your letters of the 20th November reached me only last night, and I hasten to thank you for both of them. I am particularly obliged for your kind reception of what I ventured to say about the deserts of my old friend Sir Joseph Hooker.

With respect to your Lordship's offer to submit my name to Her Majesty for a Civil List Pension, I can but accept a pro-

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\* *i.e.* whether he was to draw his salary of £200 as Dean or not.

posal which is in itself an honour, and which is rendered extremely gratifying to me by the great kindness of the expressions in which you have been pleased to embody it.

I am happy to say that I am getting steadily better at last, and under the regime of "peace with honour" that now seems to have fallen to my lot, I may fairly hope yet to do a good stroke of work or two.—I remain, my dear Lord Iddesleigh, faithfully yours,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Nov.* 24, 1885.

MY DEAR DONNELLY — I believe you have been at work again!

Lord Iddesleigh has written to me to ask if I will be recommended for a Civil List Pension of £300 a year, a very pretty letter, not at all like the Treasury masterpiece you admired so much.

Didn't see why I should not accept, and have accepted accordingly. When the announcement comes out the Liberals will say the Tory Govt. have paid me for attacking the G.O.M.! to a dead certainty.—Ever yours,  
T. H. HUXLEY.

Five days later he replies to the congratulations of Mr. Eckersley (whose son had married Huxley's third daughter):—

. . . Lord Iddesleigh's letter offering to submit my name for an honorary pension was a complete surprise.

My chiefs in the late Government wished to retire me on full pay, but the Treasury did not see their way to it, and cut off £300 a year. Naturally I am not sorry to have the loss made good, but the way the thing was done is perhaps the pleasantest part of it.

There was a certain grim appropriateness in his "official death" following hard upon his sixtieth birthday, for sixty was the age at which he had long declared that men of science ought to be strangled, lest age should harden them against the reception of new truths, and make them into clogs upon progress, the worse, in proportion to the influence they had deservedly won. This is the allusion in a birthday letter from Sir M. Foster:—

REVEREND SIR—So the "day of strangulation" has arrived at last, and with it the humble petition of your friends that you

may be induced to defer the "happy dispatch" for, say at least ten years, when the subject may again come up for consideration. For your petitioners are respectfully inclined to think that if your sixtyship may be induced so far to become an apostle as to give up the fishery business, and be led to leave the Black Board at S.K. to others, the t'other side sixty years, may after all be the best years of your life. In any case they would desire to bring under your notice the fact that *they feel they want you as much as ever they did.*—Ever thine,  
M. F.

Reference has been made to the fact that the honorary degree of D.C.L. was conferred this May upon Huxley by the University of Oxford. The Universities of the sister kingdoms had been the first thus to recognise his work; and after Aberdeen and Dublin, Cambridge, where natural science had earlier established a firm foothold, showed the way to Oxford. Indeed, it was not until his regular scientific career was at an end, that the University of Oxford opened its portals to him. So, as he wrote to Professor Bartholomew Price on May 20, in answer to the invitation, "It will be a sort of apotheosis coincident with my official death, which is imminent. In fact, I am dead already, only the Treasury Charon has not yet settled the conditions upon which I am to be ferried over to the other side."

Before leaving the subject of his connection with the Royal Society, it may be worth while to give a last example of the straightforward way in which he dealt with a delicate point whether to vote or not to vote for his friend Sir Andrew Clark who had been proposed for election to the Society. It occurred just after his return from abroad; he explains his action to Sir Joseph Hooker, who had urged caution on hearing a partial account of the proceedings.

SOUTH KENSINGTON, *April 25, 1885.*

MY DEAR HOOKER—I don't see very well how I could have been more cautious than I have been. I knew nothing of Clark's candidature until I saw his name in the list; and if he or his proposer had consulted me, I should have advised delay, because I knew very well there would be a great push made for — this year.

Being there, however, it seemed to me only just to say that



which is certainly true, namely, that Clark has just the same claim as half a dozen doctors who have been admitted without question, e.g. Gull, Jenner, Risdon Bennett, on the sole ground of standing in the profession. And I think that so long as that claim is admitted, it will be unjust not to admit Clark.

So I said what you heard; but I was so careful not to press unduly upon the Council, that I warned them of the possible prejudice arising from my own personal obligations to Clark's skill, and I went so far as not to put his name in the *first* list myself, a step which I now regret.

If this is not caution enough, I should like to know what is? As Clive said when he came back from India, "By God, sir, I am astonished at my own moderation!"

If it is not right to make a man a fellow because he holds a first-class place as a practitioner of medicine as the R.S. has done since I have known it, let us abolish the practice. But then let us also in justice refuse to recognise the half-and-half claims, those of the people who are third-rate as practitioners, and hang on to the skirts of science without doing anything in it.

Several of your and my younger scientific friends are bent on bringing in their chum —, and Clark's candidature is very inconvenient to them. Hence I suspect some of the "outspoken aversion" and criticism of Clark's claims you have heard.

I am quite willing to sacrifice my friend for a principle, but not for somebody else's friend, and I mean to vote for Clark; though I am not going to try to force my notion down any one else's throat.—Ever yours faithfully,

T. H. HUXLEY.

On the same subject he writes to Sir M. Foster:—

Obedience be hanged. It would not lie in my mouth, as the lawyers say, to object to anybody's getting his own way if he can.

If Clark had not been a personal friend of mine I should not have hesitated a moment about deciding in his favour. Under the circumstances it was quite clear what I should do if I were forced to decide, and I thought it would have been kindly and courteous to the President if he had been let off the necessity of making a decision which was obviously disagreeable to him.

If, on the other hand, it was wished to fix the responsibility of what happened on him, I am glad that he had the opportunity of accepting it. I never was more clear as to what was the right thing to do.

So also at other times; he writes in September to Sir M. Foster, the Secretary, with reference to evening gatherings at which smoking should be permitted.

BOURNEMOUTH, *Sept. 17, 1885.*

I am not at all sure that I can give my blessing to the "Tabagie." When I heard of it I had great doubts as to its being a wise move. It is not the question of "smoke" so much, as the principle of having meetings in the Society's rooms, which are not practically (whatever they may be theoretically), open to all the fellows, and which will certainly be regarded as the quasi-private parties of one of the officers. You will have all sorts of jealousies roused, and talk of a clique, etc.

When I was Secretary the one thing I was most careful to avoid was the appearance of desiring to exert any special influence. But there was a jealousy of the *x* Club, and only the other day, to my great amusement, I was talking to an influential member of the Royal Society Club about the possibility of fusing it with the Phil. Club, and he said, forgetting I was a member of the latter: "Oh! we don't want any of those wire-pullers!" Poor dear innocent dull-as-ditchwater Phil. Club!

Mention has already been made of the unveiling of the Darwin statue at South Kensington on June 9, when, as President of the Royal Society, Huxley delivered an address in the name of the Memorial Committee, on handing over the statue of Darwin to H.R.H. the Prince of Wales, as representative of the Trustees of the British Museum. The concluding words of the speech deserve quotation:—

We do not make this request [*i.e.* to accept the statue] for the mere sake of perpetuating a memory; for so long as men occupy themselves with the pursuit of truth, the name of Darwin runs no more risk of oblivion than does that of Copernicus, or that of Harvey.

Nor, most assuredly, do we ask you to preserve the statue in its cynosural position in this entrance hall of our National Museum of Natural History as evidence that Mr. Darwin's views have received your official sanction; for science does not recognise such sanctions, and commits suicide when it adopts a creed.

No, we beg you to cherish this memorial as a symbol by which, as generation after generation of students enter yonder

door, they shall be reminded of the ideal according to which they must shape their lives, if they would turn to the best account the opportunities offered by the great institution under your charge.

Nor was this his only word about Darwin. Somewhat later, Professor Mivart sent him the proofs of an article on Darwin, asking for his criticism, and received the following reply, which describes better than almost any other document, the nature of the tie which united Darwin and his friends, and incidentally touches the question of Galileo's recantation:—

*Nov. 12, 1885.*

MY DEAR MR. MIVART—I return your proof with many thanks for your courtesy in sending it. I fully appreciate the good feeling shown in what you have written, but as you ask my opinion, I had better say frankly that my experience of Darwin is widely different from yours as expressed in the passages marked with pencil. I have often remarked that I never knew any one of his intellectual rank who showed himself so tolerant to opponents, great and small, as Darwin did. Sensitive he was in the sense of being too ready to be depressed by adverse comment, but I never knew any one less easily hurt by fair criticism, or who less needed to be soothed by those who opposed him with good reason.

I am sure I tried his patience often enough, without ever eliciting more than a "Well there's a good deal in what you say; but—" and then followed something which nine times out of ten showed he had gone deeper into the business than I had.

I cannot agree with you, again, that the acceptance of Darwin's views was in any way influenced by the strong affection entertained for him by many of his friends. What that affection really did was to lead those of his friends who had seen good reason for his views to take much more trouble in his defence and support, and to strike out much harder at his adversary than they would otherwise have done. This is pardonable if not justifiable—that which you suggest would to my mind be neither.

I am so ignorant of what has been going on during the last twelvemonth, that I know nothing of your controversy with Romanes. If he is going to show the evolution of intellect from sense, he is the man for whom I have been waiting, as Kant says.

In your paper about scientific freedom, which I read some time ago with much interest, you alluded to a book or article by Father Roberts on the Galileo business. Will you kindly send me a postcard to say where and when it was published?

I looked into the matter when I was in Italy, and I arrived at the conclusion that the Pope and the College of Cardinals had rather the best of it. It would complete the paradox if Father Roberts should help me to see the error of my ways.—Ever yours very faithfully,

T. H. HUXLEY.

August and September, as said above, were spent in England, though with little good effect. Filey was not a success for either himself or his wife. Bournemouth, where they joined their eldest daughter and her family, offered a "temperature much more to the taste of both of us," and at least undid the mischief done by the wet and cold of the north.

The mean line of health was gradually rising; it was a great relief to be free at length from administrative distractions, while the retiring pensions removed the necessity of daily toil. By nature he was like the friend whom he described as "the man to become hipped to death without incessant activity of some sort or other. I am sure that the habit of incessant work into which we all drift is as bad in its way as dram-drinking. In time you cannot be comfortable without the stimulus." But the variety of interests which filled his mind prevented him from feeling the void of inaction after a busy life. And just as he was at the turning-point in health, he received a fillip which started him again into vigorous activity—the mental tonic bracing up his body and clearing away the depression and languor which had so long beset him.

The lively fillip came in the shape of an article in the November *Ninetcenth Century*, by Mr. Gladstone, in which he attacked the position taken up by Dr. Réville in his *Prolegomena to the History of Religions*, and in particular, attempted to show that the order of creation given in Genesis i., is supported by the evidence of science. This article, Huxley used humorously to say, so stirred his

bile as to set his liver right at once; and though he denied the soft impeachment that the ensuing fight was what had set him up, the marvellous curative effects of a Gladstonian dose, a remedy unknown to the pharmacopœia, became a household word among family and friends.

His own reply, "The Interpreters of Genesis and the Interpreters of Nature," appeared in the December number of the *Nineteenth Century* (*Collected Essays*, iv. p. 139). In January 1886 Mr. Gladstone responded with his "Proem to Genesis," which was met in February by "Mr. Gladstone and Genesis" (*Collected Essays*, iv. p. 164). Not only did he show that science offers no support to the "fourfold" or the "fivefold" or any other order obtained from Genesis by Mr. Gladstone, but in a note appended to his second article he gives what he takes to be the proper sense of the "Mosaic" narrative of the Creation (iv. p. 195), not allowing the succession of phenomena to represent an evolutionary notion, as suggested, of a progress from lower to higher in the scale of being, a notion assuredly not in the mind of the writer, but deducing this order from such ideas as, putting aside our present knowledge of nature, we may reasonably believe him to have held.

A vast subsidiary controversy sprang up in the *Times* on Biblical exegetics; where these touched him at all, as, for instance, when it was put to him whether the difference between the "Rehmes" of Genesis and "Sheh-retz" of Leviticus, both translated "creeping things," did not invalidate his argument as to the identity of such "creeping things," he had examined the point already, and surprised his interrogator, who appeared to have raised a very pretty dilemma, by promptly referring him to a well-known Hebrew commentator.

Several letters refer to this passage of arms. On December 4, he writes to Mr. Herbert Spencer:—

Do read my polishing off of the G.O.M. I am proud of it as a work of art, and as evidence that the volcano is not yet exhausted.

## TO LORD FARRER

4 MARLBOROUGH PLACE, *Dec.* 6, 1885.

MY DEAR FARRER—From a scientific point of view Gladstone's article was undoubtedly not worth powder and shot. But, on personal grounds, the perusal of it sent me blaspheming about the house with the first healthy expression of wrath known for a couple of years—to my wife's great alarm—and I should have "busted up" if I had not given vent to my indignation; and secondly, all orthodoxy was gloating over the slap in the face which the G.O.M. had administered to science in the person of Réville.

The ignorance of the so-called educated classes in this country is stupendous, and in the hands of people like Gladstone it is a political force. Since I became an official of the Royal Society, good taste seemed to me to dictate silence about matters on which there is "great division among us." But now I have recovered my freedom, and I am greatly minded to begin stirring the fire afresh.

Within the last month I have picked up wonderfully. If dear old Darwin were alive he would say it is because I have had a fight, but in truth the fight is consequence and not cause. I am infinitely relieved by getting rid of the eternal strain of the past thirty years, and hope to get some good work done yet before I die, so make ready for the part of the judicious bottle-holder which I have always found you.—Ever yours very faithfully,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Jan.* 13, 1886.

MY DEAR FARRER—My contribution to the next round was finished and sent to Knowles a week ago. I confess it to have been a work of supererogation; but the extreme shiftiness of my antagonist provoked me, and I was tempted to pin him and dissect him as an anatomico-psychological exercise. May it be accounted unto me for righteousness, though I laughed so much over the operation that I deserve no credit.

I think your notion is a very good one, and I am not sure that I shall not try to carry it out some day. In the meanwhile, however, I am bent upon an enterprise which I think still more important.

After I have done with the reconcilers, I will see whether theology cannot be told her place rather more plainly than she has yet been dealt with.

However, this between ourselves, I am seriously anxious to use what little stuff remains to me well, and I am not sure that I can do better service anywhere than in this line, though I don't mean to have any more controversy if I can help it.

(Don't laugh and repeat Darwin's wickedness.)—Ever yours very faithfully,  
T. H. HUXLEY.

However, this "contribution to the next round" seemed to the editor rather too pungent in tone. Accordingly Huxley revised it, the letters which follow describing the process:—

4 MARLBOROUGH PLACE, N.W., Jan. 15, 1886.

MY DEAR KNOWLES—I will be with you at 1.30. I spent three mortal hours this morning taming my wild cat. He is now castrated; his teeth are filed; his claws are cut; he is taught to swear like a "mieu"; and to spit like a cough; and when he is turned out of the bag you won't know him from a tame rabbit.—Ever yours,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., Jan. 20, 1886.

MY DEAR KNOWLES—Here is the debonnaire animal finally titivated, and I quite agree, much improved, though I mourn the loss of some of the spice. But it is an awful smash as it stands—worse than the first, I think.

I shall send you the MS. of the *Evolution of Theology* to-day or to-morrow. It will not do to divide it, as I want the reader to have an *aperçu* of the whole process from Samuel of Israel to Sammy of Oxford.

I am afraid it will make thirty or thirty-five pages, but it is really very interesting, though I say it as shouldn't.

Please have it set up in slip, though, as it is written after the manner of a judge's charge, the corrections will not be so extensive, nor the strength of language so well calculated to make a judicious editor's hair stand on end, as was the case with the enclosed (in its unregenerate state).—Ever yours very truly,  
T. H. HUXLEY.

Some time later, on September 14, 1890, writing to Mr. Hyde Clarke, the philologist, who was ten years his senior, he remarks on his object in undertaking this controversy:—

I am glad to see that you are as active-minded as ever. I have no doubt there is a great deal in what you say about the

origin of the myths in Genesis. But my sole point is to get the people who persist in regarding them as statements of fact to understand that they are fools.

The process is laborious, and not yet very fruitful of the desired conviction.

### TO SIR JOSEPH PRESTWICH

4 MARLBOROUGH PLACE, N.W., *January* 16, 1886.

MY DEAR PRESTWICH—Accept my best thanks for the volume of your *Geology*, which has just reached me.

I envy the vigour which has led you to tackle such a task, and I have no doubt that when I turn to your book for information I shall find reason for more envy in the thoroughness with which the task is done.

I see Mr. Gladstone has been trying to wrest your scripture to his own purposes, but it is no good. Neither the fourfold nor the fivefold nor the sixfold order will wash.—Ever yours very faithfully,

T. H. HUXLEY.

### TO PROFESSOR POULTON \*

4 MARLBOROUGH PLACE, *Feb.* 19, 1886.

DEAR MR. POULTON—I return herewith the number of the *Expositor* with many thanks. Canon Driver's article contains as clear and candid a statement as I could wish of the position of the Pentateuchal cosmogony from his point of view. If he more thoroughly understood the actual nature of paleontological succession—I mean the species by species replacement of old forms by new,—and if he more fully appreciated the great gulf fixed between the ideas of "creation" and of "evolution," I think he would see (1) that the Pentateuch and science are more hopelessly at variance than even he imagines, and (2) that the Pentateuchal cosmogony does not come so near the facts of the case as some other ancient cosmogonies, notably those of the old Greek philosophers.

Practically, Canon Driver, as a theologian and Hebrew scholar, gives up the physical truth of the Pentateuchal cosmogony altogether. All the more wonderful to me, therefore, is the way in which he holds on to it as embodying theological truth. So far as this question is concerned, on all points which

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\* Hope Professor of Zoology at Oxford.



can be tested, the Pentateuchal writer states that which is not true. What, therefore, is his authority on the matter—creation by a Deity—which cannot be tested? What sort of “inspiration” is that which leads to the promulgation of a fable as divine truth, which forces those who believe in that inspiration to hold on, like grim death, to the literal truth of the fable, which demoralises them in seeking for all sorts of sophistical shifts to bolster up the fable, and which finally is discredited and repudiated when the fable is finally proved to be a fable? If Satan had wished to devise the best means of discrediting “Revelation” he could not have done better.

Have you not forgotten to mention the leg of *Archæopteryx* as a characteristically bird-like structure? It is so, and it is to be recollected that at present we know nothing of the greater part of the skeletons of the older mesozoic mammals—only teeth and jaws. What the shoulder-girdle of *Stereognathus* might be like is uncertain.—Ever yours very faithfully,

T. H. HUXLEY.

The following letters have a curious interest as showing what, in the eyes of a supporter of educational progress, might and might not be done at Oxford to help on scientific education:—

4 MARLBOROUGH PLACE, *Dec.* 21, 1885.

MY DEAR MASTER\*—I have been talking to some of my friends about stimulating the Royal Society to address the Universities on the subject of giving greater weight to scientific acquirements, and if I find that there is a better prospect than I had hoped for of getting President and Council to move. But I am not quite sure about the course which it will be wisest for us to adopt, and I beg a little counsel on that matter.

I presume that we had better state our wishes in the form of a letter to the Vice-Chancellor, and that we may prudently ask for the substitution for modern languages (especially German) and elementary science for some of the subjects at present required in the literary part of the examinations of the scientific and medical faculties. If we could gain this much it would be a great step, not only in itself, but in its reaction on the schools.—Ever yours very faithfully,

T. H. HUXLEY.

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\* This is from the first draft of the letter. Huxley's letters to Jowett were destroyed by Jowett's orders, together with the rest of his correspondence.

4 MARLBOROUGH PLACE, *Dec. 26, 1885.*

MY DEAR FOSTER—Please read the enclosed letter from Jowett (confidentially). I had suggested the possibility of diminishing the Greek and Latin for the science and medical people, but that, you see, he won't have. But he is prepared to load the classical people with science by way of making things fair.

It may be worth our while to go in for this, and trust to time for the other. What say you?

Merry Christmas to you. The G.O.M. is going to reply, so I am likely to have a happy New Year! I expect some fun, and I mean to make it an occasion for some good earnest.—Ever yours very faithfully,

T. H. HUXLEY.

So ends 1885, and with it closes another definite period of Huxley's life. Free from official burdens and official restraints, he was at liberty to speak out on any subject; his strength for work was less indeed, but his time was his own; there was hope that he might still recover his health for a few more years. And though the ranks of his friends were beginning to thin, though he writes (May 20, to Professor Bartholomew Price):—

The "gaps" are terrible accompaniments of advancing life. It is only with age that one realises the full truth of Goethe's quatrain:—

*Eine Bruche ist ein jeder Tag, etc.*

And again:—

The *x* Club is going to smithereens, as if a charge of dynamite had been exploded in the midst of it. Busk is slowly fading away. Tyndall is, I fear, in a bad way, and I am very anxious about Hooker.

Still the club hung together for many years, and outside it were other devoted friends, who would have echoed Dr. Foster's good wishes on the last day of the year:—

A Happy New Year! and many of them, and may you more and more demonstrate the folly of strangling men at sixty.

## CHAPTER VIII

1886

THE controversy with Mr. Gladstone indicates the nature of the subject that Huxley took up for the employment of his newly obtained leisure. Chequered as this leisure was all through the year by constant illness, which drove him again and again to the warmth of Bournemouth or the brisk airs of the Yorkshire moors in default of the sovereign medicine of the Alps, he managed to write two more controversial articles this year, besides a long account of the "Progress of Science," for Mr. T. Humphry Ward's book on *The Reign of Queen Victoria*, which was to celebrate the Jubilee year 1887. Examinations—for the last time, however—the meetings of the Eton Governing Body, the business of the Science Schools, the Senate of the London University, the Marine Biological Association, the Council of the Royal Society, and a round dozen of subsidiary committees, all claimed his attention. Even when driven out of town by his bad health he would come up for a few days at a time to attend necessary meetings.

One of the few references of this period to biological research is contained in a letter to Professor Pelsener of Ghent, a student of the Mollusca, who afterwards completed for Huxley the long unfinished monograph on "Spirula" for the *Challenger* Report.

4 MARLBOROUGH PLACE, Jan. 8, 1886.

DEAR SIR—Accept my best thanks for the present of your publications. As you may imagine I find that on the cretaceous crustaceans very interesting. It was a rare chance to find the branchiae preserved.

I am glad to be able to send you a copy of my memoir on the morphology of the Mollusca. It shows signs of age outside, but I beg you to remember that it is 33 years old.

I am rejoiced to think you find it still worth consulting. It has always been my intention to return to the subject some day, and to try to justify my old conclusions—as I think they may be justified.

But it is very doubtful whether my intention will now ever be carried into effect.—I am yours very faithfully,

T. H. HUXLEY.

Mr. Gladstone's second article appeared in the January number of the *Nineteenth Century*. To this the following letter refers:—

4 MARLBOROUGH PLACE, N.W., *Jan. 21, 1886.*

MY DEAR SKELTON—Thanks for your capital bit of chaff. I took a thought and began to mend (as Burns' friend and *my* prototype (G.O.M.) is not yet recorded to have done) about a couple of months ago, and then Gladstone's first article caused such a flow of bile that I have been the better for it ever since.

I need not tell you I am entirely crushed by his reply—still the worm will turn and there is a faint squeak (as of a rat in the mouth of a terrier) about to be heard in the next *Nineteenth*.

But seriously, it is to me a grave thing that the destinies of this country should at present be seriously influenced by a man, who, whatever he may be in the affairs of which I am no judge—is nothing but a copious shuffler, in those which I do understand.—With best wishes to Mrs. Skelton and yourself, ever yours very faithfully,

T. H. HUXLEY.

With the article in the February number of the *Nineteenth Century*, he concluded his tilt with Mr. Gladstone upon the interpretation of Genesis. His supposed "unjaded appetite" for controversy was already satiated; and he begged leave to retire from "that 'atmosphere of contention' in which Mr. Gladstone has been able to live, alert and vigorous beyond the common race of men, as if it were purest mountain air," for the "Elysium" of scientific debate, which "suits my less robust constitution better." A vain hope. Little as he liked controversy at bottom, in spite of the skill—it must be allowed, at times, a pleasurable

skill—in using the weapons of debate, he was not to avoid it any more than he was to avoid the east wind when he went to Bournemouth from early in February till the end of March, of which he writes on February 23:—

The “English Naples” is rather Florentine so far as a bitter cold east wind rather below than above 0°C. goes, but from all I hear it is a deal better than London, and I am picking up in spite of it. I wish I were a *Holothuria*, and could get on without my viscera. I should do splendidly then.

Here he wrote a long article on the “Evolution of Theology” (*Collected Essays*, iv. 287) which appeared in the March and April numbers of the *Nineteenth Century*. It was a positive statement of the views he had arrived at, which underlay the very partial—and therefore misleading—exposition of them possible in controversy. He dealt with the subject, not with reference to the truth or falsehood of the notions under review, but purely as a question of anthropology, “a department of biology to which I have at various times given a good deal of attention.” Starting with the familiar ground of the Hebrew Scriptures, he thus explains the paleontological method he proposes to adopt:—

In the venerable record of ancient life, miscalled a book, when it is really a library comparable to a selection of works from English literature between the times of Beda and those of Milton, we have the stratified deposits (often confused and even with their natural order inverted) left by the stream of the intellectual and moral life of Israel during many centuries. And, embedded in these strata, there are numerous remains of forms of thought which once lived, and which, though often unfortunately mere fragments, are of priceless value to the anthropologist. Our task is to rescue these from their relatively unimportant surroundings, and by careful comparison with existing forms of theology to make the dead world which they record live again.

A subsequent letter to Professor Lewis Campbell, bears upon this essay. It was written in answer to an enquiry prompted by the comparison here drawn between the primitive spiritual theories of the books of Judges and Samuel, and the very similar development of ideas among the Ton-

gans, as described by Mariner, who lived many years among the natives.

HODESLEA, Oct. 10, 1894.

MY DEAR CAMPBELL—I took a good deal of trouble years ago to satisfy myself about the point you mention, and I came to the conclusion that Mariner was eminently trustworthy, and that Martin was not only an honest, but a shrewd and rather critical, reporter. The story he tells about testing Mariner's version of King Theebaw's oration shows his frame of mind (and is very interesting otherwise in relation to oral tradition).

I have a lot of books about Polynesia, but of all I possess and have read, Mariner is to my mind the most trustworthy.

The missionaries are apt to colour everything, and they never have the chance of knowing the interior life as Mariner knew it. It was this conviction that led me to make Mariner my *cheval de bataille* in "Evolution of Theology."

I am giving a great deal of trouble—ill for the last week, and at present with a sharp lumbago! so nice! With our love to Mrs. Campbell and yourself—Ever yours,  
T. H. H.

The circumstances under which the following letter was written are these. The activity of the Home Rulers and the lethargy of Unionists had caused one side only of the great question then agitating English politics, to be represented in the American press, with the result that the funds of the Nationalists were swelled by subscriptions from persons who might have acted otherwise if the arguments on the other side had been adequately laid before them.

Mr. Albert Grey, M.P., therefore had arranged for a series of clear, forcible pronouncements from strong representative Englishmen against a separate Parliament, to be cabled over to New York to a syndicate of influential newspapers, and his American advisers desired that the opening statement should be from Huxley.

Although it will be seen from the letter that he would not undertake this task, Mr. Grey showed the letter to one or two of the leading Liberal Unionists to strengthen their hands, and begged permission to publish it for the benefit of the whole party. Accordingly, it appeared in the *Times* of April 13, 1886.

CASALINI, W. BOURNEMOUTH, *March 21, 1886.*

DEAR MR. GREY—I am as much opposed to the Home Rule scheme as any one can possibly be, and if I were a political man I would fight against it as long as I had any breath left in me; but I have carefully kept out of the political field all my life, and it is too late for me now to think of entering it.

Anxious watching of the course of affairs for many years past has persuaded me that nothing short of some sharp and sweeping national misfortune will convince the majority of our countrymen that government by average opinion is merely a circuitous method of going to the devil; and that those who profess to lead but in fact slavishly follow this average opinion are simply the fastest runners and the loudest squeakers of the herd which is rushing blindly down to its destruction.

It is the electorate, and especially the Liberal electorate, which is responsible for the present state of things. It has no political education. It knows well enough that 2 and 2 won't make 5 in a ledger, and that sentimental stealing in private life is not to be tolerated; but it has not been taught the great lesson in history that there are like verities in national life, and hence it easily falls a prey to any clever and copious fallacy-monger who appeals to its great heart instead of reminding it of its weak head.

Politicians have gone on flattering and cajoling this chaos of political incompetence until the just penalty of believing their own fictions has befallen them, and the average member of Parliament is conscientiously convinced that it is his duty, not to act for his constituents to the best of his judgment, but to do exactly what they, or rather the small minority which drives them, tells him to do.

Have we a real statesman? a man of the calibre of Pitt or Burke, to say nothing of Strafford or Pym, who will stand up and tell his countrymen that this disruption of the union is nothing but a cowardly wickedness—an act bad in itself, fraught with immeasurable evil—especially to the people of Ireland; and that if it cost his political existence, or his head, for that matter, he is prepared to take any and every honest means of preventing the mischief?

I see no sign of any. And if such a man should come to the front what chance is there of his receiving loyal and continuous support from a majority of the House of Commons? I see no sign of any.

There was a time when the political madness of one party

was sure to be checked by the sanity, or at any rate the jealousy of the other. At the last election I should have voted for the Conservatives (for the first time in my life) had it not been for Lord Randolph Churchill; but I thought that by thus jumping out of the Gladstonian frying-pan into the Churchillian fire I should not mend matters, so I abstained altogether.

Mr. Parnell has great qualities. For the first time the Irish malcontents have a leader who is not eloquent, but who is honest; who knows what he wants and faces the risks involved in getting it. Our poor Right Honourable Rhetoricians are no match for this man who understands realities. I believe also that Mr. Parnell's success will destroy the English politicians who permit themselves to be his instruments, as soon as bitter experience of the consequences has brought Englishmen and Scotchmen (and I will add Irishmen) to their senses.

I suppose one ought not to be sorry for that result, but there are men among them over whose fall all will lament.—I am,  
yours very faithfully,  
T. H. HUXLEY.

Some of the newspapers took these concluding paragraphs to imply support of Parnell, so that at the end of June he writes:—

The *Tribune* man seems to have less intelligence than might be expected. I spoke approvingly of the way in which Parnell had carried out his policy, which is rather different from approving the policy itself.

But these newspaper scribes don't take the trouble to understand what they read.

While at Bournemouth he also finished and sent off to the *Youth's Companion*, an American paper, an article on the evolution of certain types of the house, called "From the Hut to the Pantheon." Beginning with a description of the Pantheon, that characteristically Roman work with its vast dome, so strongly built that it is the only great dome remaining without a flaw:—

For a long time (he says) I was perplexed to know what it was about the proportions of the interior of the Pantheon which gave me such a different feeling from that made by any other domed space I had ever entered.



The secret of this he finds in the broad and simple design peculiar to the building, and then shows in detail how

the round hut, the *Ædes Vestæ*, and the Pantheon are so many stages in a process of architectural evolution which was effected between the first beginnings of Roman history and the Augustan age.

The relation between the beehive hut, the *terremare*, and the pile-dwellings of Italy lead to many suggestive bits of early anthropology, which, it may be hoped, bore fruit in the minds of some of his youthful readers.

We find him also reading over proofs for Mr. Herbert Spencer, who, although he might hesitate to ask for his criticism with respect to a subject on which they had a "standing difference," still

concluded that to break through the long-standing usage, in pursuance of which I have habitually submitted my biological writing to your castigation, and so often profited by so doing, would seem like a distrust of your candour—a distrust which I cannot entertain.

So he wrote in January; and on March 19 he wrote again, with another set of proofs—

Toujours l'audace! More proofs to look over. Don't write a critical essay, only marginal notes. Perhaps you will say, like the Roman poet to the poetaster who asked him to erase any passages he did not like, and who replied, "One erasure will suffice"—perhaps you will say, "There needs only one marginal note."

To this he received answer:—

CASALINI, W. BOURNEMOUTH, *March 22, 1886.*

MY DEAR SPENCER—More power to your elbow! You will find my blessing at the end of the proof.

But please look very carefully at some comments which are not merely sceptical criticisms, but deal with matters of fact.

I see the difference between us on the speculative question lies in the conception of the primitive protoplasm. I conceive it as a mechanism set going by heat—as a sort of active crystal with the capacity of giving rise to a great number of pseudo-morphs; and I conceive that external conditions favour one or

the other pseudomorph, but leave the fundamental mechanism untouched.

You appear to me to suppose that external conditions modify the machinery, as if by transferring a flour-mill into a forest you could make it into a saw-mill. I am too much of a sceptic to deny the possibility of anything—especially as I am now so much occupied with theology—but I don't see my way to your conclusion.

And that is all the more reason why I don't want to stop you from working it out, or rather to make the "one erasure" you suggest. For as to stopping you, "ten on me might," as the navy said to the little special constable who threatened to take him into custody.—Ever yours very faithfully,

T. H. HUXLEY.

Warmth and sea-fogs here for a variety.

One more letter may be given from this time at Bournemouth—a letter to his eldest daughter on the loss of her infant son:—

CASALINI, W. BOURNEMOUTH, *March 2, 1886.*

It's very sad to lose your child just when he was beginning to bind himself to you, and I don't know that it is much consolation to reflect that the longer he had wound himself up in your heartstrings the worse the tear would have been, which seems to have been inevitable sooner or later. One does not weigh and measure these things while grief is fresh, and in my experience a deep plunge into the waters of sorrow is the hopefulest way of getting through them on to one's daily road of life again. No one can help another very much in these crises of life; but love and sympathy count for something, and you know, dear child, that you have these in fullest measure from us.

On coming up to London in April he was very busy, among other things, with a proposal that the Marine Biological Association, of which he was President, should urge the Government to appoint a scientific adviser to the Fishery Board. A letter of his on this subject had appeared in the *Times* for March 30. There seemed to him, with his practical experience of official work, insuperable objections to the status of such an officer. Above all, he would be a representative of science in name, without any responsibility to the body of scientific men in the country. Some of his

younger colleagues on the Council, who had not enjoyed the same experience, thought that he had set aside their expressions of opinion too brusquely, and begged Sir M. Foster, as at once a close friend of his, and one to whose opinion he paid great respect, to make representations to him on their behalf, which he did in writing, being kept at home by a cold. To this letter, in which his friend begged him not to be vexed at a very plain statement of the other point of view, but to make it possible for the younger men to continue to follow his lead, he replied:—

4 MARLBOROUGH PLACE, *April 5, 1886.*

MY DEAR FOSTER—Mrs. Foster is quite right in looking sharp after your colds, which is very generous of me to say, as I am down in the mouth and should have been cheered by a chat.

I am very glad to know what our younger friends are thinking about. I made up my mind to some such result of the action I have thought it necessary to take. But I have no ambition to lead, and no desire to drive them, and if we can't agree, the best way will be to go our ways separately. . . .

Heaven forbid that I should restrain anybody from expressing any opinion in the world. But it is so obvious to me that not one of our friends has the smallest notion of what administration in fishery questions means, or of the danger of creating a scientific Frankenstein in that which he is clamouring for, that I suppose I have been over-anxious to prevent mischief, and seemed domineering.

Well, I shall mend my ways. I must be getting to be an old savage if you think it risky to write anything to me.—Ever yours,  
T. H. HUXLEY.

But he did not stay long in London. By April 20 he was off to Ilkley, where he expected to stay “for a week or two, perhaps longer.” On the 24th he writes to Sir M. Foster:—

I was beginning to get wrong before we left Bournemouth, and went steadily down after our return to London, so that I had to call in a very shrewd fellow who attends my daughter M——. Last Monday he told me that more physicking was no good, and that I had better be off here, and see what exercise and the fresh air of the moors would do for me. So here I came, and mean to give the place a fair trial.

I do a minimum of ten miles per diem without fatigue, and as I eat, drink, and sleep well, there ought to be nothing the matter with me. Why, under these circumstances, I should never feel honestly cheerful, or know any other desire than that of running away and hiding myself, I don't know. No explanation is to be found even in Foster's *Physiology!* The only thing my demon can't stand is sharp walking, and I will give him a dose of that remedy when once I get into trim.

Indeed he was so much better even after a single day at Ilkley, that he writes home:—

It really seems to me that I am an impostor for running away, and I can hardly believe that I felt so ill and miserable four-and-twenty hours ago.

And on the 28th he writes to Sir M. Foster:—

I have been improving wonderfully in the last few days. Yesterday I walked to Bolton Abbey, the Strid, etc., and back, which is a matter of sixteen miles, without being particularly tired, though the afternoon sun was as hot as midsummer.

It is the old story—a case of candle-snuff—some infernal compound that won't get burnt up without more oxygenation than is to be had under ordinary conditions. . . .

I want to be back and doing something, and yet have a notion that I should be wiser if I stopped here a few weeks and burnt up my rubbish effectually. A good deal will depend upon whether I can get my wife to join me or not. She has had a world of worry lately.

As to his fortunate choice of an hotel, "I made up my mind," he writes, "to come to this hotel merely because Bradshaw said it was on the edge of the moor—but for once acting on an advertisement turned out well." The moor ran up six or seven hundred feet just outside the garden, and the hotel itself was well outside and above the town and the crowd of visitors. Here, with the exception of a day or two in May and a fortnight at the beginning of June, he stayed till July, living as far as possible an outdoor life, and getting through a fair amount of correspondence.

It was not to be expected that he should long remain

unknown, and he was sometimes touched, more often bored, by the forms which this recognition took. Thus two days after his arrival he writes home:—

Sitting opposite to me at the *table d'hôte* here is a nice old Scotch lady. People have found out my name here by this time, and yesterday she introduced herself to me, and expressed great gratitude for the advice I gave to a son of hers two or three years ago. I had great difficulty in recollecting anything at all about the matter, but it seems the youngster wanted to go to Africa, and I advised him not to, at anyrate at present. However, the poor fellow went, and died, and they seem to have found a minute account of his interview with me in his diary.

But all were not of this kind. On the 26th he writes:—

I took a three hours' walk over the moors this morning with nothing but grouse and peewits for company, and it was perfectly delicious. I am beginning to forget that I have a liver, and even feel mildly disposed to the two fools of women between whom I have to sit every meal.

27th.— . . . I wish you would come here if only for a few days—it would do you a world of good after your anxiety and wear and tear for the last week. And you say you are feeling weak. Please come and let me take care of you a bit; I am sure the lovely air here would set you up. I feel better than I have for months. . . .

The country is lovely, and in a few days more all the leaves will be out. You can almost hear them bursting. Now come down on Saturday and rejoice the “sair een” of your old husband who is wearying for you.

Another extract from the same correspondence expresses his detestation for a gross breach of confidence:—

April 22.— . . . I have given Mr. — a pretty smart setting down for sending me Ruskin's letter to him! It really is iniquitous that such things should be done. Ruskin has a right to say anything he likes in a private letter, and — must be a perfect cad to send it on to me.

The following letter on the ideal of a Paleontological Museum is a specialised and improved version of his earlier schemes on the same subject:—

4 MARLBOROUGH PLACE, *May* 3, 1886.

MY DEAR FOSTER—I cannot find Hughes' letter, and fancy I must have destroyed it. So I cannot satisfy Newton as to the exact terms of his question.

But I am quite clear that my answer was not meant to recommend any particular course for Cambridge, when I know nothing about the particular circumstances of the case, but referred to what I should like to do if I had *carte blanche*.

It is as plain as the nose on one's face (mine is said to be very plain) that Zoological and Botanical collections should illustrate (1) Morphology, (2) Geographical Distribution, (3) Geological Succession.

It is also obvious to me that the morphological series ought to contain examples of all the extinct types in their proper places. But I think it will be no less plain to any one who has had anything to do with Geology and Paleontology that the great mass of fossils is to be most conveniently arranged stratigraphically. The Jermyn St. Museum affords an example of the stratigraphical arrangement.

I do not know that there is anywhere a collection arranged according to Provinces of Geographical Distribution. It would be a great credit to Cambridge to set the example of having one.

If I had a free hand in Cambridge or anywhere else I should build (A) a Museum, open to the public, and containing three strictly limited and selected collections; one morphologically, one geographically, and one stratigraphically arranged; and (B) a series of annexes arranged for storage and working purposes to contain the material which is of no use to any but specialists. I am convinced that this is the only plan by which the wants of ordinary people can be supplied efficiently, while ample room is afforded for additions to any extent without large expense in building.

On the present plan or no plan, Museums are built at great cost, and in a few years are choked for want of room.

If you have the opportunity, I wish you would explain that I gave no opinion as to what might or might not be expedient under present circumstances at Cambridge. I do not want to seem meddlesome.—Ever yours very faithfully,

T. H. HUXLEY.

Don't forget Cayley.

*N.B.*—As my meaning seems to have been misunderstood I wish, if you have the chance, you would make it clear that I do not want three brick and mortar museums—but one public

museum—containing a threefold collection of typical forms, a biological Trinity in Unity in fact.

It might conciliate the clerics if you adopted this illustration. But as *your own*, mind. I should not like them to think me capable of it.

However, even Ilkley was not an infallible cure. Thus he writes to Sir M. Foster:—

*May 17.*—I am ashamed of myself for not going to town to attend the Gov. Grant Committee and Council, but I find I had better stop here till the end of the month, when I must return for a while anyhow.

I have improved very much here, and so long as I take heaps of exercise every day I have nothing to complain of beyond a fit of blue devils when I wake in the morning.

But I don't want to do any manner of work, still less any manner of play, such as is going on in London at this time of year, and I think I am wise to keep out of it as long as I can.

I wish I knew what is the matter with me. I feel always just on the verge of becoming an absurd old hypochondriac, and as if it only wanted a touch to send me over.

*May 27.*— . . . The blue devils worry me far less than they did. If there were any herd of swine here I might cast them out altogether, but I expect they would not go into blackfaced sheep.

I am disposed to stop not more than ten days in London, but to come back here and bring some work with me. In fact I do not know that I should return yet if it were not that I do not wish to miss our usual visit to Balliol, and that my Spanish daughter is coming home for a few months. . . .

I am overwhelmed at being taken at my word about scientific federation.\* “Something will transpire” as old Gutzlaff † said when he flogged plaintiff, defendant and witnesses in an obscure case.

*P.S.*—I have had an invitation from ——— to sign “without committing myself to details” an approbation of his grand scheme. ‡ A stupendous array of names appear thus committed

\* *i.e.* a federation between the Royal Society and scientific societies in the colonies.

† This worthy appears to have been an admiral on the China station about 1840.

‡ For the reorganisation of the Fisheries Department.

to the "principle of the Bill." I prefer to be the Hartington of the situation.

During this first stay in London he wrote twice to Mr. Herbert Spencer, from whom he had, according to custom, received some proofs to read. The first set were from his autobiography; after twice reading Huxley had merely marked a couple of paragraphs containing personal references which might possibly be objectionable "to the 'heirs, administrators and assigns,' if there are any, or to the people themselves if they are living still." He continues, June 1:—

You will be quite taken aback at getting a proof from me with so few criticisms, but even I am not so perverse as to think that I can improve your own story of your own life!

I notice a curious thing. If Ransom\* had not overworked himself, I should probably not be writing this letter.

For if he had worked less hard I might have been first and he second at the Examination at the University of London in 1845. In which case I should have obtained the Exhibition, should not have gone into the navy, and should have forsaken science for practice. . . .

Again on June 4:—

MY DEAR SPENCER—Here's a screed for you! I wish you well through it.

Mind, I have no *a priori* objection to the transmission of functional modifications whatever. In fact, as I told you, I should rather like it to be true.

But I argued against the assumption (with Darwin as I do with you) of the operation of a factor which, if you forgive me for saying so, seems as far off support by trustworthy evidence now as ever it was.—Ever yours very faithfully,

T. H. HUXLEY.

On the same day he wrote to Mr. (afterwards Sir John) Skelton:—

4 MARLBOROUGH PLACE, LONDON, N.W.,

June 4, 1886.

MY DEAR SKELTON—A civil question deserves a civil answer—Yes. I am sorry to say I know—nobody better—"what it is to be unfit for work." I have been trying to emerge from that

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\* Dr. Ransom of Nottingham.



condition, first at Bournemouth, and then at Ilkley, for the last five months, with such small success that I find a few days in London knocks me up, and I go back to the Yorkshire moors next week.

We have no water-hens there—nothing but peewits, larks, and occasional grouse—but the air and water are of the best, and the hills quite high enough to bring one's muscles into play.

I suppose that Nebuchadnezzar was quite happy so long as he was grazed and kept clear of Babylon; if so, I can hold him for my Scripture parallel.

I wish I could accept your moral No. 2, but there is amazingly little evidence of "reverential care for unoffending creation" in the arrangements of nature, that I can discover. If our ears were sharp enough to hear all the cries of pain that are uttered in the earth by men and beasts, we should be deafened by one continuous scream!

And yet the wealth of superfluous loveliness in the world condemns pessimism. It is a hopeless riddle.—Ever yours,

T. H. HUXLEY.

Please remember me to Mrs. Skelton.

The election of a new Headmaster at Eton, where he was a member of the Governing Body, was a matter of no small concern to him at this moment. Some parts of the existing system seemed impossible to alter, though a reform in the actual scheme and scope of teaching seemed to him both possible and necessary for the future well-being of the school. He writes to his eldest son on July 6, 1886:—

The whole system of paying the Eton masters by the profits of the boarding-houses they keep is detestable to my mind, but any attempt to alter it would be fatal.

. . . I look to the new appointment with great anxiety. It will make or mar Eton. If the new Headmaster has the capacity to grasp the fact that the world has altered a good deal since the Eton system was invented, and if he has the sense to adapt Eton to the new state of things, without letting go that which was good in the old system, Eton may become the finest public school in the country.

If on the contrary he is merely a vigorous representative of the old system pure and simple, the school will go to the dogs.

I think it is not unlikely that there may be a battle in the Governing Body over the business, and that I shall be on the

losing side. But I am used to that, and shall do what I think right nevertheless.

The same letter contains his reply to a suggestion that he should join a society whose object was to prevent a railway from being run right through the Lake district.

I am not much inclined to join the "Lake District Defence Society." I value natural beauty as much as most people—indeed I value it so much, and think so highly of its influence that I would make beautiful scenery accessible to all the world, if I could. If any engineering or mining work is projected, which will really destroy the beauty of the Lakes, I will certainly oppose it, but I am not disposed, as Goschen said, to "give a blank cheque" to a Defence Society, the force of which is pretty certain to be wielded by the most irrational fanatics among its members.

Only the other day I walked the whole length of Bassenthwaite from Keswick and back, and I cannot say that the little line of rails which runs along the lake, now coming into view and now disappearing, interfered with my keen enjoyment of the beauty of the lake any more than the macadamised road did. And if it had not been for that railway I should not have been able to make Keswick my headquarters, and I should have lost my day's delight.

People's sense of beauty should be more robust. I have had apocalyptic visions looking down Oxford Street at a sunset before now.—Ever, dear lad, your loving father,

T. H. HUXLEY.

After this he took his wife to Harrogate, "just like Clapham Common on a great scale," where she was ordered to drink the waters. For himself, it was as good as Ilkley, seeing that he needed "nothing but fresh air and exercise, and just as much work that interests me as will keep my mind from getting 'blue mouldy.'" The work in this case was the chapter in the Life of Charles Darwin, which he had promised Mr. F. Darwin to finish before going abroad.

On July 10, he writes to Sir M. Foster on the rejection of the Home Rule Bill:—

The smashing of the G.O.M. appears to be pretty complete, though he has unfortunately enough left to give him the means of playing an ugly game of obstruction in the next Parliament.

You have taken the shine out of my exultation at Lubbock's majority—though I confess I was disheartened to see so many educated men going in for the disruption policy. If it were not for Randolph I should turn Tory, but that fellow will some day oust Salisbury as Dizzy ousted old Derby, and sell his party to Parnell or anybody else who makes a good bid.

We are flourishing on the whole. Sulphide of wife joins with me in love.—Ever yours,  
T. H. H.

On the 21st he writes:—

The formation of Huxley sulphide will be brought to a sudden termination to-morrow when we return to London. The process has certainly done my wife a great deal of good and I wish it could have gone on a week or two longer, but our old arrangements are upset and we must start with the chicks for Switzerland on the 27th, that is next Tuesday.

## CHAPTER IX

1886

THE earlier start was decided upon for the sake of one of his daughters, who had been ill. He went first to Evolena, but the place did not suit him, and four days after his arrival went on to Arolla, whence he writes on August 3:—

We reached Evolena on Thursday last. . . . We had glorious weather Thursday and Friday, and the latter day (having both been told carefully to avoid over-exertion), the wife and I strolled, quite unintentionally, as far as the Glacier de Ferpècle and back again. Luckily the wife is none the worse, and indeed, I think I was the more tired of the two. But we saw at once that Evolena was a mistake for our purpose, and were confirmed in that opinion by a deluge of rain on Saturday. The hotel is down in a hole at the tail of a dirty Swiss village, and only redeemed by very good cooking. So, Sunday being fine, I, E. and H. started up here to prospect, 18 miles up and down, and 2000 feet to climb, and did it beautifully. It is just the place for us, at the tail of a glacier in the midst of a splendid amphitheatre of 11–12000 feet snow heights, and yet not bare and waste, any quantity of stone-pines growing about. . . . I rather long for the flesh-pots of Evolena—cooking here being decidedly rudimentary—otherwise we are very well off.

The keen air of six thousand feet above sea level worked wonders with the invalids. The lassitude of the last two years was swept away, and Huxley came home eager for active life. Here too it was that, for occupation, he took up the study of gentians; the beginning of that love of his garden which was so great a delight to him in his last years. On his return home he writes:—

4 MARLBOROUGH PLACE, *Sept. 10, 1886.*

MY DEAR FOSTER—We got back last evening after a very successful trip. Arolla suited us all to a T, and we are all in great force. As for me, I have not known of the existence of my liver, and except for the fact that I found fifteen or sixteen miles with a couple of thousand feet up and down quite enough, I could have deluded myself into the fond imagination that I was twenty years younger.

By way of amusement I bought a Swiss Flora in Lausanne and took to botanising—and my devotion to the gentians led the Bishop of Chichester—a dear old man, who paid us (that is the hotel) a visit—to declare that I sought the “Ur-gentian” as a kind of Holy Grail. The only interruption to our felicity was the death of a poor fellow, who was brought down on a guide’s back from an expedition he ought not to have undertaken, and whom I did my best to keep alive one night. But rapid pleuritic effusion finished him the next morning, in spite of (I hope not in consequence of) such medical treatment as I could give him.

I see you had a great meeting at Birmingham, but I know not details. The delegation to Sydney is not a bad idea, but why on earth have they arranged that it shall arrive in the middle of the hot weather? Speechifying with the thermometer at 90° in the shade will try the nerves of the delegates, I can tell them.

I shall remain quietly here and see whether I can stand London. I hope I may, for the oestrus of work is upon me—for the first time this couple of years. Let me have some news of you. With our love to your wife and you—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., *Sept. 14, 1886.*

MY DEAR DONNELLY—I hear that some of your alguazils were looking after me yesterday, so I had better give myself up at once—hoping it will be considered in the sentence.

The fact is I have been going to write to you ever since we came back last Thursday evening, but I had about fifty other letters to write and got sick of the operation.

We are all in great force, and as for me, I never expected a year ago to be as well as I am. I require to look in the glass and study the crows’ feet and the increasing snow cap on the summit of my Tête noire (as it once was), to convince myself I am not twenty years younger.

How long it will last I don't feel sure, but I am going to give London as little chance as possible.

I trust you have all been thriving to a like extent. Scott \* wrote to me the other day wanting to take his advanced flock (2—one, I believe, a ewe-lamb) to Kew. I told him I had no objection, but he had better consult you.

I have not been to S.K. yet—as I have a devil (botanical—) and must satisfy him before doing anything else. It's the greatest sign of amendment that I have gone in for science afresh. When I am ill (and consequently venomous), nothing satisfies me but gnawing at theology; it's a sort of crib-biting.

Our love to Mrs. Donnelly. I suppose G.H.† is by this time a kind of Daniel Lambert physically and Solomon mentally—my blessing to him.—Ever yours very faithfully,

T. H. HUXLEY.

As a sequel to the sad event mentioned in the former letter, the relations of the young man who had died so suddenly at Arolla wished to offer Huxley some gift in grateful recognition of the kindness he had shown to the poor fellow; but being unable to fix upon any suitable object, begged him to accept a considerable sum of money and expend it on any object he pleased as a memento. To this he replied, November 21, 1886:—

I am very much obliged for the kindly recognition of my unfortunately unavailing efforts to be of service to your brother-in-law which is contained in your letter.

But I and those who right willingly helped me did nothing more than our plain duty in such a case; and though I fully appreciate the motives which actuate Mrs. — and yourself and friends, and would gladly accept any trifle as a memento of my poor friend (I call him so, for we really struck up a great friendship in our twelve hours' acquaintance), I could not with any comfort use the very handsome cheque you offer.

Let me propose a compromise. As you will see by the enclosed paper, a colleague of mine has just died leaving widow and children in very poor circumstances. Contribute something to the fund which is being raised for their benefit, and I shall consider it as the most agreeable present you could possibly make to me.

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\* Assistant Professor of Botany at the Royal College of Science.

† Gordon Huxley Donnelly, Sir John's son.

And if you wish me to have a personal memento of our friend, send me a pipe that belonged to him. I am greatly devoted to tobacco, and will put it in a place of honour in my battery of pipes.

The bracing effects of Arolla enabled him to stay two months in town before again retiring to Ilkley to be "screwed up." He had on the stocks his Gentian Paper and the chapter for the Darwin Life, besides the chapter on the Progress of Science for the *Reign of Victoria*, all of which he finished off this autumn; he was busy with Technical Education, and the Egyptian borings which were being carried out under the superintendence of the Royal Society. Finally he was induced by a "diabolical plot" on the part of Mr. Spencer to read, and in consequence to answer, an article in the *Fortnightly* for November by Mr. Lilly on "Materialism and Morality." These are the chief points with which the following correspondence is concerned.

4 MARLBOROUGH PLACE, *Sept.* 16, 1886.

MY DEAR FOSTER—I enclose the Report\* and have nothing to suggest except a quibble at p. 4. If you take a stick in your hand you may feel lots of things and determine their form, etc., with the other end of it, but surely the stick is properly said to be insensible. D<sup>o</sup>. with the teeth. I feel very well with mine (which are paid for) but they are surely not sensible? Old Tomes once published the opinion that the contents of the dentine tubules were sensory nerves, on the ground of our feeling so distinctly through our teeth. He forgot the blind man's stick. Indeed the reference of sensation to the end of a stick is one of the most interesting of psychological facts.

It is extraordinary how those dogs of examinees return to their vomit. Almost all the obstinate fictions you mention are of a quarter of a century date. Only then they were dominant and epidemic—now they are sporadic.

I wish Pasteur or somebody would find some microbe with which the rising generation could be protected against them.

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\* The Annual Report of the Examiners in Physiology under the Science and Art Department, which, being still an Examiner, he had to sign.

We shall have to re-arrange the Examination business—this partner having made his fortune and retiring from firm. Think over what is to be done.—Ever yours,  
T. H. H.

You don't happen to grow gentians in your Alpine region, do you?

Of his formal responsibility for the examinations he had written earlier in the year:—

WELLS HOUSE, ILKLEY, *June 15, 1886.*

MY DEAR DONNELLY—I think it is just as well that you could not lay your hands on ink, for if you had you would only have blacked them. (*N.B.* This is a goak.)

You know we resolved that it was as well that I should go on as Examiner (unpaid) this year. But I rather repent me of it—for although I could be of use over the questions, I have had nothing to do with checking the results of the Examination except in honours, and I suspect that Foster's young Cambridge allies tend always to screw the standard up.

I am inclined to think that I had much better be out of it next year. The attempt to look over examination papers now would reduce the little brains I have left to mere pulp—and, on the other hand, if there is any row about results, it is not desirable that I should have to say that I have not seen the answers.

When I go you will probably get seven devils worse than the first—but that is not the fault of the first devil.

I am picking up here wonderfully in spite of the bad weather. It rained hard yesterday and blew ditto—to-day it is blowing dittoes—but there is sunshine between the rain and squalls.

I hope you are better off. What an outlandish name "Tetronila." I don't believe you have spelt it right. With best regards to Mrs. Donnelly and my godson.—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Sept. 16, 1886.*

MY DEAR HOOKER—I have sucked Grisebach's brains, looked up *Flora B. Americana*, and *F. Antarctica and New Zealand*, and picked about in other quarters. I found I knew as much as Grisebach had to tell me (and more) about *lutea*, *purpureo-punctata*, *acaulis*, *campestris*, and the *verna* lot, which are all I got hold of at Arolla. But he is very good in all but classification, which is logically "without form and void, and darkness on the face of it."



I shall have to verify lots of statements about gentians I have not seen, but at present the general results are very curious and interesting. The species fall into four groups, one *primary* least differentiated—three, specialised.

1. Lobes of corolla fringed. 2. Coronate. 3. Interlobate (*i.e.* not the "plica" between the proper petals).

Now the interesting point is that the Antarctic species are all primary and so are the great majority of the Andean forms. *Lutea* is the only old-world primary, unless the Himalayan *Moorcroftiana* belongs here. The Arctic forms are also primary, but the petals more extensively united.

The specialised types are all Arctogæal with the exception of half a dozen or so Andean species including *prostrata*.

There is a strange general parallelism with the cray-fishes! which also have their primary forms in Australia and New Zealand, avoid E. S. America and Africa, and become most differentiated in Arctogæa. But there are also differences in detail.

It strikes me that this is uncommonly interesting; but, of course, all the information about the structure of the flowers, etc., I get at second hand, wants verifying.

Have you done the gentians of your *Flora Indica* yet? Do look at them from this point of view.

I cannot make out what Grisebach means by his division of Chondrophylla. What is a "cartilaginous" margin to a leaf?—"Folia margine cartilaginea!" He has a lot of Indian sp. under this head.

I send you a rough scheme I have drawn up. Please let me have it back. Any annotations thankfully received. Shan't apologise for bothering you.

I hope the pension is settled at last.—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Sept. 22, 1886.*

MY DEAR HOOKER—I have written to Lubbock a long screed stating my views\* with unmistakable distinctness as politeful as may be, and asking him, if he thought well, to send them on to whomsoever it may concern. As old Gutzlaff † used to say when he wanted to get evidence from a Chinese—"Gif him four

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\* Referring to the relations between the S. K. department and the City and Guilds Committee on Technical Education.

† See p. 141.

dozen, something vill transpire." At any rate the Chinees transpired, and I hope some official will.

Here beginneth more gentian craze.

I have not examined *Moorcroft*. yet, but if the figure in Roxb. is trustworthy it's a primary and no mistake. I can't understand your admitting *Amarellae* without coronae. The presence of a corona is part of the definition of the *amarella* group, and an *amarella* without a corona is a primary *ipso facto*.

Taking the facts as I have got them in the rough, and subject to minor verifications, the contrast between the Andean, Himalayan, and Caucasian Gentian Florae is very striking.

	Simplices.	Ciliatae.	Coronatae.	Interlobatae.
Andes	27	0 (?)	15	2
Himalayas	1 ( <i>Moorcroft</i> .)	0	4	32
Caucasus Pyrenees (all one)	2 ( <i>lutea</i> <i>umbellata</i> )	2	5	21

I don't think *Ciliatae* worth anything as a division. I took it as it stood.

It is clear that migration helps nothing, as between the old-world and S. American Florae. It is the case of the Tapirs (Andean and Sino-Malayan) over again. Relics of a tertiary Flora which once extended from S. America to Eurasia through N. America (by the west, probably).

I see a book by Engler on the development of Floras since tertiary epoch. Probably the beggar has the idea.—Ever yours,

T. H. HUXLEY.

GODALMING, *Sept.* 25, 1886.

MY DEAR FOSTER—We are here till to-morrow on a visit to Leonard, seeing how the young folks keep house.

I brought the Egyptian report down with me. It is very important, and in itself justifies the expenditure. Any day next (that is to say this) week that you like I can see Col. Turner. If you and Evans can arrange a day I don't think we need mind the rest of the Committee. We must get at least two other borings ten or fifteen miles off, if possible on the same parallel, by hook or by crook. It will tell us more about the Nile valley than has ever been known. That Italian fellow who published sections must have lied considerably.

Touching gentians, I have not examined your specimen yet, but it certainly did not look like *Andrewsii*. You talk of having *acaulis* in your garden. That is one of the species I worked out

most carefully at Arolla, but its flowering time was almost over, and I only got two full-blown specimens to work at. If you have any in flower and don't mind sacrificing one with a bit of the rhizoma, and would put it in spirit for me, I could settle one or two points still wanting. Whisky will do, and you will be all the better for not drinking the whisky!

The distributional facts, when you work them in connection with morphology, are lovely. We put up with Donnelly on our way here. He has taken a cottage at Felday, eleven miles from hence, in lovely country—on lease. I shall have to set up a country residence some day, but as all my friends declare their own locality best, I find a decision hard. And it is a bore to be tied to one place.—Ever yours,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, Oct. 20, 1886.

MY DEAR HOOKER—I wish you would not mind the trouble of looking through the enclosed chapter which I have written at F. Darwin's request, and tell me what you think of it. F. D. thinks I am hard upon the "Quarterly Article," but I read it afresh and it is absolutely scandalous. The anonymous vilifiers of the present day will be none the worse for being reminded that they may yet hang in chains. I expect, from all I hear, that Gosse has had very hard measure, and you may see that Cotter Morison (who is a very good authority) says that the Reviewer is quite wrong about the Harrington business, of which he makes so much.

It occurs to me that it might be well to add a paragraph or two about the two chief objections made formerly and now to Darwin, the one, that it is introducing "chance" as a factor in nature, and the other that it is atheistic.

Both assertions are utter bosh. None but parsons believe in "chance"; and the philosophical difficulties of Theism now are neither greater nor less than they have been ever since Theism was invented.—Ever yours,  
T. H. H.

Old experience, indeed, made him sympathise so much with Mr. Edmund Gosse for his treatment in a celebrated literary controversy, that he wrote him the following letter:—

Oct. 22, 1886.

DEAR SIR—I beg leave to offer you my best thanks for your letter to the *Athenæum*, which I have just read, and to congratulate you on the force and completeness of your answer to your assailant.

It is rarely worth while to notice criticism, but when a good chance of exposing one of these anonymous libellers who disgrace literature occurs, it is a public duty to avail oneself of it.

Oddly enough, I have recently been performing a similar "haute œuvre." The most violent, base, and ignorant of all the attacks on Darwin at the time of the publication of the "Origin of Species" appeared in the *Quarterly Review* of that time; and I have built the reviewer a gibbet as high as Haman's.

All good men and true should combine to stop this system of literary moonlighting.—I am yours very faithfully,

T. H. HUXLEY.

As for the incitement to answer Mr. Lilly, Mr. Spencer writes from Brighton on November 3:—

I have no doubt your combative instincts have been stirred within you as you read Mr. Lilly's article, "Materialism and Morality," in which you and I are dealt with after the ordinary fashion popular with the theologians, who practically say, "You *shall* be materialists whether you like it or not." I should not be sorry if you yielded to those promptings of your combative instinct. Now that you are a man of leisure there is no reason why you should not undertake any amount of fighting, providing always that you can find foemen worthy of your steel. . . .

I remember that last year you found intellectual warfare good for your health, so I have no qualms of conscience in making the suggestion.

To this he replies on the 7th:—

Your stimulation of my combative instincts is downright wicked. I will not look at the *Fortnightly* article lest I succumb to temptation. At least not yet. The truth is that these cursed irons of mine, that have always given me so much trouble, will put themselves in the fire, when I am not thinking about them. There are three or four already.

On November 21 Mr. Spencer sends him more proofs of his autobiography, dealing with his early life:—

See what it is to be known as an omnivorous reader—you get no mercy shown you. A man who is ready for anything, from a fairy tale to a volume of metaphysics, is naturally one who will make nothing of a fragment of a friend's autobiography!

To this he replies on the 25th:—

4 MARLBOROUGH PLACE, *Nov.* 25, 1886.

MY DEAR SPENCER—In spite of all prohibition I must write to you about two things. First, as to the proof returned herewith—I really have no criticisms to make (miracles, after all, may not be incredible). I have read your account of your boyhood with great interest, and I find nothing there which does not contribute to the understanding of the man. No doubt about the truth of evolution in your own case.

Another point which has interested me immensely is the curious similarity to many recollections of my own boyish nature which I find, especially in the matter of demanding a reason for things and having no respect for authority.

But I was more docile, and could remember anything I had a mind to learn, whether it was rational or irrational, only in the latter case I hadn't the mind.

But you were infinitely better off than I in the matter of education. I had two years of a Pandemonium of a school (between 8 and 10) and after that neither help nor sympathy in any intellectual direction till I reached manhood. Good heavens! if I had had a father and uncle who troubled themselves about my education as yours did about your training, I might say as Bethell said of his possibilities had he come under Jowett, "There is no knowing to what eminence I might not have attained." Your account of them gives me the impression that they were remarkable persons. Men of that force of character, if they had been less wise and self-restrained, would have played the deuce with the abnormal chicken hatched among them.

The second matter is that your diabolical plot against Lilly has succeeded—*vide* the next number of the *Fortnightly*.\* I was fool enough to read his article, and the rest followed. But I do not think I should have troubled myself if the opportunity had not been good for clearing off a lot of old scores.

The bad weather for the last ten days has shown me that I want screwing up, and I am off to Ilkley on Saturday for a week or two. Ilkley Wells House will be my address. I should like to know that you are picking up again.—Ever yours very faithfully,

T. H. HUXLEY.

And again on December 13:—

I am very glad to have news of you which on the whole is not unsatisfactory. Your conclusion as to the doctors is one

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\* Science and Morals, *Coll. Ess.* ix. 117.

I don't mind telling you in confidence I arrived at some time ago. . . .

I am glad you liked my treatment of Mr. Lilly. . . . I quite agree with you that the thing was worth doing for the sake of the public.

I have in hand another bottle of the same vintage about Modern Realism and the abuse of the word Law, suggested by a report I read the other day of one of Liddon's sermons.\*

The nonsense these great divines talk when they venture to meddle with science is really appalling.

Don't be alarmed about the history of Victorian science.† I am happily limited to the length of a review article or thereabouts, and it is (I am happy to say it is nearly done) more of an essay on the history of science, bringing out the broad features of the contrast between past and present, than the history itself. It seemed to me that this was the only way of dealing with such a subject in a book intended for the general public.

The article "Science and Morals" was not only a satisfaction to himself, but a success with the readers of the *Fortnightly*. To his wife he writes:—

*December 2.*—Have you had the *Fortnightly*? How does my painting of the Lilly look?

*December 8.*—Harris . . . says that my article "simply made the December number," which pretty piece of gratitude means a lively sense of favours to come.

*December 13.*—I had a letter from Spencer yesterday chuckling over the success of his setting me on Lilly.

Ilkley had a wonderful effect upon him. "It is quite absurd," he writes after 24 hours there, "but I am wonderfully better already." His regimen was of the simplest, save perhaps on one point. "Clark told me," he says with the utmost gravity, "always to drink tea and eat hot cake at 4.30. I have persevered, however against my will, and last night had no dreams, but slept like a top." Two hours' writing in the morning were followed by two hours' sharp walking; in the afternoon he first took two hours' walking or strolling if the weather were decent; "then Clark's prescription diligently taken" (*i.e.* tea and a pipe) and a couple

\* "Pseudo-Scientific Realism," *Coll. Ess.* iv. 59.

† See p. 149.

of hours more writing; after dinner reading and to bed before eleven.

I am working away (he writes) in a leisurely comfortable manner at my chapter for Ward's Jubilee book, and have got the first few pages done, which is always my greatest trouble.

*December 8.*— . . . Canon Milman wrote to me to come to the opening of the New Buildings for Sion College, which the Prince is going to preside over on the 15th. I had half a mind to accept, if only for the drollery of finding myself among a solemn convocation of the city clergy. However, I thought it would be opening the floodgates, and I prudently declined.

One more letter may perhaps be quoted as illustrating the clearness of vision in administrative matters which made it impossible for him to sit quietly by and see a tactical blunder being committed, even though his formal position might not seem to warrant his interference. This is his *apologia* for such a step.

*Dec. 16, 1886.*

MY DEAR FOSTER—On thinking over this morning's Committee work,\* it strikes my conscience that being neither President or Chairman nor officer I took command of the boat in a way that was hardly justifiable.

But it occurred to me that our sagacious — for once was going astray and playing into —'s hands, without clearly seeing what he was doing, and I bethought me of "*salus Societatis suprema lex*," and made up my mind to stop the muddle we were getting into at all costs. I hope he was not disgusted nor you either. X. ought to have cut in, but he did not seem inclined to do so.

I am clearly convinced it was the right thing to do—anyhow.  
—Ever yours,  
T. H. H.

The chronicle of the year may fitly close with a letter from Ilkley to Dr. Dohrn, *apropos* of his recommendation of a candidate for a biological professorship. The "honest sixpence got by hard labour," refers to a tour in the Highlands which he had once taken with Dr. Dohrn, when, on a rough day, they were being rowed across Loch Leven to Mary Stuart's castle. The boatman, unable to make head

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\* Some Committee of the Royal Society.

single-handed against the wind, asked them each to take an oar; but when they landed and Huxley tendered the fare, the honest fellow gave him back two sixpences, saying, "I canna tak' it: you have wrocht as hard as I." Each took a coin; and Huxley remarked that this was the first sixpence he had earned by manual labour. Dr. Dohrn, I believe, still carries his sixpence in memory of the occasion.

WELLS HOUSE, ILKLEY, YORKSHIRE, Dec. 1, 1886.

MY DEAR DOHRN—You see by my address that I am *en retraite*, for a time. As good catholics withdraw from the world now and then for the sake of their souls—so I, for the sake of my body (and chiefly of my liver) have retired for a fortnight or so to the Yorkshire moors—the nearest place to London where I can find dry air 1500 feet above the sea, and the sort of uphill exercise which routs out all the unoxygenated crannies of my organism. Hard frost has set in, and I had a walk over the moorland which would have made all the blood of the Ostsee pirates—which I doubt not you have inherited—alive, and cleared off the fumes of that detestable Capua to which you are condemned. I should like to have seen the nose of one [of] your Neapolitan nobilissimes after half-an-hour's exposure to the north wind, clear and sharp as a razor, which very likely looked down on Loch Leven a few hours ago.

Ah well! "fuius"—I am amused at the difficulty you find in taking up the position of a "grave and reverend senior"; because I can by no means accustom myself to the like dignity. In spite of my grey hairs "age hath not cooled the Douglas blood" altogether, and I have a gratifying sense that (liver permitting) I am still capable of much folly. All this, however, has not much to do with poor Dr. — to whom, I am sorry to say, your letter could do no good, as it arrived after my colleagues and I had settled the business.

But there were a number of strong candidates who had not much chance. If it is open to me to serve him hereafter, however, your letter will be of use to him, for I know you do not recommend men lightly.

After some eighteen months of misery—the first thing that did me any good was coming here. But I was completely set up by six or seven weeks at Arolla in the Valais. The hotel was 6400 feet up, and the wife and daughters and I spent most of our time in scrambling about the 2000 feet between that and the



snow. Six months ago I had made up my mind to be an invalid, but at Arolla I walked as well as I did when you and I made pilgrimages—and earned the only honest sixpence (I, at any rate) ever got for hard labour. Three months in London brought me down again, so I came here to be “mended.”

You know English literature so well that perhaps you have read Wordsworth’s “White Doe of Rylstone.” I am in that country, within walk of Bolton Abbey.

Please remember me very kindly to the Signora—and thank her for copying the letter in such a charmingly legible hand. I wish mine were like it.

If I am alive we shall go to Arolla next summer. Could we not meet there? It is a fair half-way.—Ever yours,

T. H. HUXLEY.

## CHAPTER X

1887

THE first half of 1887, like that of the preceding year, was chequered by constant returns of ill-health. "As one gets older," he writes in a New Year's letter to Sir J. Donnelly, "hopes for oneself get more moderate, and I shall be content if next year is no worse than the last. Blessed are the poor in spirit!" The good effects of the visit to Arolla had not outlasted the winter, and from the end of February he was obliged to alternate between London and the Isle of Wight.

Nevertheless, he managed to attend to a good deal of business in the intervals between his periodic flights to the country, for he continued to serve on the Royal Society Council, to do some of the examining work at South Kensington, and to fight for the establishment of adequate Technical Education in England. He attended the Senate and various committees of the London University and of the Marine Biological Association.

Several letters refer to the proposal—it was the Jubilee year—to commemorate the occasion by the establishment of the Imperial Institute. To this he gladly gave his support; not indeed to the merely social side; but in the opportunity of organising the practical applications of science to industry he saw the key to success in the industrial war of the future. Seconding the resolution proposed by Lord Rothschild at the Mansion House meeting on January 12, he spoke of the relation of industry to science—the two great developments of this century. Formerly practical men looked askance at science, "but within the last thirty years, more particularly," continues the report in *Nature* (vol.

xxxiii. p. 265) "that state of things had entirely changed. There began in the first place a slight flirtation between science and industry, and that flirtation had grown into an intimacy, he might almost say courtship, until those who watched the signs of the times saw that it was high time that the young people married and set up an establishment for themselves. This great scheme, from his point of view, was the public and ceremonial marriage of science and industry."

Proceeding to speak of the contrast between militarism and industrialism, he asked whether, after all, modern industry was not war under the forms of peace. The difference was the difference between modern and ancient war, consisting in the use of scientific weapons, of organisation and information. The country, he concluded, had dropped astern in the race for want of special education which was obtained elsewhere by the artisan. The only possible chance for keeping the industry of England at the head of the world was through organisation.

Writing on January 18, to Mr. Herbert Spencer, who had sent him some proofs of his *Autobiography* to look through, he says:—

I see that your proofs have been in my hands longer than I thought for. But you may have seen that I have been "staring" at the Mansion House.

This was not exactly one of those bits of over-easiness to pressure with which you reproach me—but the resultant of a composition of pressures, one of which was the conviction that the "Institute" might be made into something very useful and greatly wanted—if only the projectors could be made to believe that they had always intended to do that which your humble servant wants done—that is the establishment of a sort of Royal Society for the improvement of industrial knowledge and an industrial university—by voluntary association.

I hope my virtue may be its own reward. For except being knocked up for a day or two by the unwonted effort, I doubt whether there will be any other. The thing has fallen flat as a pancake, and I greatly doubt whether any good will come of it. Except a fine in the shape of a subscription, I hope to escape further punishment for my efforts to be of use.

However, this was only the beginning of his campaign.

On January 27, a letter from him appeared in the *Times*, guarding against a wrong interpretation of his speech, in the general uncertainty as to the intentions of the proposers of the scheme.

I had no intention (he writes) of expressing any enthusiasm on behalf of the establishment of a vast permanent bazaar. I am not competent to estimate the real utility of these great shows. What I do see very clearly is that they involve difficulties of site, huge working expenses, the potentiality of endless squabbles, and apparently the cheapening of knighthood.

As for the site proposed at South Kensington, "the arguments used in its favour in the report would be conclusive if the dry light of reason were the sole guide of human action." But it would alienate other powerful and wealthy bodies, which were interested in the Central Institute of the City and Guilds Technical Institute, "which looks so portly outside and is so very much starved inside."

He wrote again to the *Times* on March 21:—

The Central Institute is undoubtedly a splendid monument of the munificence of the city. But munificence without method may arrive at results indistinguishably similar to those of stinginess. I have been blamed for saying that the Central Institute is "starved." Yet a man who has only half as much food as he needs is indubitably starved, even though his short rations consist of ortolans and are served upon gold plate.

Only half the plan of operations as drawn up by the Committee was, or could be, carried out on existing funds.

The later part of his letter was printed by the Committee as defining the functions of the new Institute:—

That with which I did intend to express my strong sympathy was the intention which I thought I discerned to establish something which should play the same part in regard to the advancement of industrial knowledge which has been played in regard to science and learning in general, in these realms, by the Royal Society and the Universities. . . . I pictured the Imperial Institute to myself as a house of call for all those who are concerned in the advancement of industry; as a place in which the home-keeping industrial could find out all he wants to know

about colonial industry and the colonist about home industry; as a sort of neutral ground on which the capitalist and the artisan would be equally welcome; as a centre of intercommunication in which they might enter into friendly discussion of the problems at issue between them, and, perchance, arrive at a friendly solution of them. I imagined it a place in which the fullest stores of industrial knowledge would be made accessible to the public; in which the higher questions of commerce and industry would be systematically studied and elucidated; and where, as in an industrial university, the whole technical education of the country might find its centre and crown. If I earnestly desire to see such an institution created, it is not because I think that or anything else will put an end to pauperism and want—as somebody has absurdly suggested,—but because I believe it will supply a foundation for that scientific organisation of our industries which the changed conditions of the times render indispensable to their prosperity. I do not think I am far wrong in assuming that we are entering, indeed, have already entered, upon the most serious struggle for existence to which this country has ever been committed. The latter years of the century promise to see us embarked in an industrial war of far more serious import than the military wars of its opening years. On the east, the most systematically instructed and best-informed people in Europe are our competitors; on the west, an energetic off-shoot of our own stock, grown bigger than its parent, enters upon the struggle possessed of natural resources to which we can make no pretension, and with every prospect of soon possessing that cheap labour by which they may be effectually utilised. Many circumstances tend to justify the hope that we may hold our own if we are careful to “organise victory.” But to those who reflect seriously on the prospects of the population of Lancashire and Yorkshire—should the time ever arrive when the goods which are produced by their labour and their skill are to be had cheaper elsewhere—to those who remember the cotton famine and reflect how much worse a customer famine would be, the situation appears very grave.

On February 19 and 22, he wrote again to the *Times* declaring against the South Kensington site. It was too far from the heart of commercial organisation in the city, and the city people were preparing to found a similar institution of their own. He therefore wished to prevent the

Imperial Institute from becoming a weak and unworthy memorial of the reign.

A final letter to the *Times* on March 21, was evoked by the fact that Lord Hartington, in giving away the prizes at the Polytechnic Y.M.C.A., had adopted Huxley's position as defined in his speech, and declared that science ought to be aided on precisely the same grounds on which we aid the army and navy.

In this letter he asks, how do we stand prepared for the task thus imperatively set us? We have the machinery for providing instruction and information, and for catching capable men, but both in a disjointed condition—"all mere torsos—fine, but fragmentary." "The ladder from the School Board to the Universities, about which I dreamed dreams many years ago, has not yet acquired much more substantiality than the ladder of Jacob's vision," but the Science and Art Department, the Normal School of Science, and the Central Institute only want the means to carry out the recommendations already made by impartial and independent authority. "Economy does not lie in sparing money, but in spending it wisely."

He concluded with an appeal to Lord Hartington to take up this task of organising industrial education and bring it to a happy issue.

A proposal was also made to the Royal Society to cooperate, and Sir M. Foster writes on February 19: "We have appointed a Committee to consider and draw up a draft reply with a view of the R.S. following up your letter."

To this Huxley replied on the 22nd:—

. . . My opinion is that the R.S. has no right to spend its money or pledge its credit for any but scientific objects, and that we have nothing to do with sending round the hat for other purposes.

The project of the Institute Committee as it stands connected with the South Kensington site—is condemned by all the city people and will receive none but the most grudging support from them. They are going to set up what will be practically an Institute of their own in the city.

The thing is already a failure. I daresay it will go on and

be varnished into a simulacrum of success—to become eventually a ghost like the Albert Hall or revive as a tea garden.

The following letter also touches upon the function of the Institute from the commercial side:—

4 MARLBOROUGH PLACE, *Feb.* 20, 1887.

MY DEAR DONNELLY—Mr. Law's suggestion gives admirable definition to the notions that were floating in my mind when I wrote in my letter to the *Times*, that I imagined the Institute would be a "place in which the fullest stores of industrial knowledge would be made accessible to the public." A man of business who wants to know anything about the prospects of trade with say, Boorioboola-gha (*vide* Bleak House) ought to be able to look into the Institute and find there somebody, who will at once fish out for him among the documents in the place all that is known about Boorioboola.

But a Commercial Intelligence Department is not all that is wanted, *vide* valuable letter aforesaid.

I hope your appetite for the breakfast was none the worse for last night's doings—mine was rather improved, but I am dog-tired.—Ever yours very faithfully,

T. H. HUXLEY.

I return Miss ——'s note. She evidently thinks my cage is labelled "These animals bite."

Later in the year, the following letters show him continuing the campaign. But an attack of pleurisy, which began the very day of the Jubilee, prevented him from coming to speak at a meeting upon Technical Education. In the autumn, however, he spoke on the subject at Manchester, and had the satisfaction of seeing the city "go solid," as he expressed it, for technical education. The circumstances of this visit are given later.

4 MARLBOROUGH PLACE, N.W., *May* 1, 1887.

MY DEAR ROSCOE—I met Lord Hartington at the Academy Dinner last night and took the opportunity of urging upon him the importance of following up his technical education speech. He told me he had been in communication with you about the matter, and he seemed to me to be very well disposed to your plans.

I may go on crying in the wilderness until I am hoarse, with no result, but if he and you and Mundella will take it up, something may be done.—Ever yours very faithfully,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *June 28, 1887.*

MY DEAR ROSCOE—Donnelly was here on Sunday and was quite right up to date. I felt I ought to be better, and could not make out why the deuce I was not. Yesterday the mischief came out. There is a touch of pleurisy—which has been covered by the muscular rheumatism.

So I am relegated to bed and told to stop there—with the company of cataplasms to keep me lively.

I do not think the attack in any way serious—but M. Pl. is a gentleman not to be trifled with, when you are over sixty, and there is nothing for it but to obey my doctor's orders.

Pray do not suppose I would be stopped by a trifle, if my coming to the meeting \* would really have been of use. I hope you will say how grieved I am to be absent.—Ever yours very faithfully,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *June 29, 1887.*

MY DEAR ROSCOE—I have scrawled a variety of comments on the paper you sent me. Deal with them as you think fit.

Ever since I was on the London School Board I have seen that the key of the position is in the Sectarian Training Colleges and that wretched imposture, the pupil teacher system. As to the former *Delenda sunt* no truce or pact to be made with them, either Church or Dissenting. Half the time of their students is occupied with grinding into their minds their tweedle-dum and tweedle-dee theological idiocies, and the other half in cramming them with boluses of other things to be duly spat out on examination day. Whatever is done do not let us be deluded by any promises of theirs to hook on science or technical teaching to their present work.

I am greatly disgusted that I cannot come to Tyndall's dinner to-night †—but my brother-in-law's death would have stopped me (the funeral to-day)—even if my doctor had not forbidden me to leave my bed. He says I have some pleuritic effusion on one side and must mind my P's and Q's.—Ever yours very faithfully,

T. H. HUXLEY.

\* Of July 1, on Technical Education.

† See p. 177.



A good deal of correspondence at this time with Sir M. Foster relates to the examination of the Science and Art Department. He was still Dean, it will be remembered, of the Royal College of Science, and further kept up his connection with the Department by acting in an honorary capacity as Examiner, setting questions, but less and less looking over papers, acting as the channel for official communications, as when he writes (April 24), "I send you some Department documents—nothing alarming, only more worry for the Asst. Examiners, and that *we* do not mind"; and finally signing the Report. But to do this after taking so small a share in the actual work of examining, grew more and more repugnant to him, till on October 12 he writes:—

I will read the Report and sign it if need be—though there really must be some fresh arrangement.

Of course I have entire confidence in your judgment about the examination, but I have a mortal horror of putting my name to things I do not know of my own knowledge.

In addition to these occupations, he wrote a short paper upon a fossil, *Ceratochelys*, which was read at the Royal Society on March 31; while on April 7 he read at the Linnean (*Botany*: vol. xxiv. pp. 101–124), his paper, "The Gentians: Notes and Queries," which had sprung from his holiday amusement at Arolla.

Philosophy, however, claimed most of his energies. The campaign begun in answer to the incursion of Mr. Lilly was continued in the article "Science and Pseudo-Scientific Realism" (*Coll. Essays*, v. 59–89) which appeared in the *Nineteenth Century* for February 1887. The text for this discourse was the report of a sermon by Canon Liddon, in which that eminent preacher spoke of catastrophes as the antithesis of physical law, yet possible inasmuch as a "lower law" may be "suspended" by the "intervention of a higher," a mode of reasoning which he applied to the possibility of miracles such as that of Cana.

The man of science was up in arms against this incarnation of abstract terms, and offered a solemn protest against that modern recrudescence of ancient realism which speaks

of "laws of nature" as though they were independent entities, agents, and efficient causes of that which happens, instead of simply our name for observed successions of facts.

Carefully as all personalities had been avoided in this article, it called forth a lively reply from the Duke of Argyll, rebuking him for venturing to criticise the preacher, whose name was now brought forward for the first time, and raising a number of other questions, philosophical, geological, and biological, to which Huxley rejoined with some selections from the authentic history of these points in "Science and Pseudo-Science" (*Nineteenth Century*, April 1887, *Coll. Essays*, v. 90-125).

Moreover, judging from the vivacity of the Duke's reply that some of the shafts of the first article must have struck nearer home than the pulpit of St. Paul's, he was induced to read "The Reign of Law," the second chapter of which, dealing with the nature of "Law," he now criticised sharply as "a sort of 'summa' of pseudo-scientific philosophy," with its confusions of law and necessity, law and force, "law in the sense, not merely of a rule, but of a cause."

He wound up with some banter upon the Duke's picture of a scientific Reign of Terror, whereby, it seemed, all men of science were compelled to accept the Darwinian faith, and against which Huxley himself was preparing to rebel, as if,

forsooth, I am supposed to be waiting for the signal of "revolt," which some fiery spirits among these young men are to raise before I dare express my real opinions concerning questions about which we older men had to fight in the teeth of fierce opposition and obloquy—of something which might almost justify even the grandiloquent epithet of a Reign of Terror—before our excellent successors had left school.

Here for a while the debate ceased. But in the September number of the *Nineteenth Century*, the Duke of Argyll returned to the fray with an article called "A Great Lesson," in which he attempted to offer evidence in support of his assertions concerning the scientific reign of terror. The two chief pieces of evidence adduced were Bathybius and Dr. (now Sir J.) Murray's theory of coral reefs. The

former was instanced as a blunder due to the desire of finding support for the Darwinian theory in the existence of this widespread primordial life; the latter as a case in which a new theory had been systematically burked, for fear of damaging the infallibility of Darwin, who had propounded a different theory of coral reefs!

Huxley's reply to this was contained in the latter half of an article which appeared in the *Nineteenth Century* for November 1887, under the title of "Science and the Bishops" (reprinted both in *Controverted Questions* and in the *Collected Essays*, v. 126, as "An Episcopal Trilogy"). Preaching at Manchester this autumn, during the meeting of the British Association, the Bishops of Carlisle, Bedford, and Manchester had spoken of science not only with knowledge, but in the spirit of equity and generosity. "These sermons," he exclaims, "are what the Germans call *Epochemachend!*"

How often was it my fate (he continues), a quarter of a century ago, to see the whole artillery of the pulpit brought to bear upon the doctrine of evolution and its supporters! Anyone unaccustomed to the amenities of ecclesiastical controversy would have thought we were too wicked to be permitted to live.

After thus welcoming these episcopal advances, he once more repudiated the *à priori* argument against the efficacy of prayer, the theme of one of the three sermons, and then proceeded to discuss another sermon of a dignitary of the Church, which had been sent to him by an unknown correspondent, for "there seems to be an impression abroad—I do not desire to give any countenance to it—that I am fond of reading sermons."

Now this preacher was of a very different mind from the three bishops. Instead of dwelling upon the "supreme importance of the purely spiritual in our faith," he warned his hearers against dropping off any of the miraculous integument of their religion. "Christianity is essentially miraculous, and falls to the ground if miracles be impossible." He was uncompromisingly opposed to any accommodation with advancing knowledge, or with the high standard of veracity, enforced by the nature of their pur-

suits, in which Huxley found the only difference between scientific men and any other class of the community.

But it was not merely this misrepresentation of science on its speculative side which Huxley deplored; he was roused to indignation by an attack on its morality. The preacher reiterated the charge brought forward in the "Great Lesson," that Dr. Murray's theory of coral reefs had been actually suppressed for two years, and that by the advice of those who accepted it, for fear of upsetting the infallibility of the great master.

Hereupon he turned in downright earnest upon the originator of the assertion, who, he considered, had no more than the amateur's knowledge of the subject. A plain statement of the facts was refutation enough. The new theories, he pointed out, had been widely discussed; they had been adopted by some geologists, although Darwin himself had not been converted, and after careful and prolonged re-examination of the question, Professor Dana, the greatest living authority on coral reefs, had rejected them. As Professor Judd said, "If this be a 'conspiracy of silence,' where, alas! can the geological speculator seek for fame?" Any warning not to publish in haste was but advice to a still unknown man not to attack a seemingly well-established theory without making sure of his ground.\*

As for the *Bathybius* myth, Huxley pointed out that his announcement of the discovery had been simply a statement of the actual facts, and that so far from seeing in it a confirmation of Darwinian hypotheses, he was careful to warn his readers "to keep the questions of fact and the questions of interpretation well apart." "That which interested me in the matter," he says, "was the apparent analogy of *Bathybius* with other well-known forms of lower life," . . . "if *Bathybius* were brought up alive from the bottom of the Atlantic to-morrow, the fact would not have the slightest bearing, that I can discern, upon Mr. Darwin's speculations, or upon any of the disputed problems of biology." And as for his "eating the leek" afterwards, his

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\* Letter in *Nature*.

ironical account of it is an instance of how the adoption of a plain, straightforward course can be described without egotism.

The most considerable difference I note among men (he concludes) is not in their readiness to fall into error, but in their readiness to acknowledge these inevitable lapses.

As the Duke in a subsequent article did not unequivocally withdraw his statements, Huxley declined to continue public controversy with him.

Three years later, writing (October 10, 1890) to Sir J. Donnelly apropos of an article by Mr. Mallock in the *Nineteenth Century*, which made use of the "Bathybius myth," he says:—

Bathybius is far too convenient a stick to beat this dog with to be ever given up, however many lies may be needful to make the weapon effectual.

I told the whole story in my reply to the Duke of Argyll, but of course the pack give tongue just as loudly as ever. Clerically-minded people cannot be accurate, even the liberals.

I give here the letter sent to the "unknown correspondent" in question, who had called his attention to the fourth of these sermons.

4 MARLBOROUGH PLACE, *Sept.* 30, 1887.

I have but just returned to England after two months' absence, and in the course of clearing off a vast accumulation of letters, I have come upon yours.

The Duke of Argyll has been making capital out of the same circumstances as those referred to by the Bishop. I believe that the interpretation put upon the facts by both is wholly misleading and erroneous.

It is quite preposterous to suppose that the men of science of this or any other country have the slightest disposition to support any view which may have been enunciated by one of their colleagues, however distinguished, if good grounds are shown for believing it to be erroneous.

When Mr. Murray arrived at his conclusions I have no doubt he was advised to make his ground sure before he attacked a generalisation which appeared so well founded as that of Mr. Darwin respecting coral reefs.

If he had consulted me I should have given him that advice myself, for his own sake. And whoever advised him, in that sense, in my opinion did wisely.

But the theologians cannot get it out of their heads, that as they have creeds, to which they must stick at all hazards, so have the men of science. There is no more ridiculous delusion. We, at any rate, hold ourselves morally bound to "try all things and hold fast to that which is good"; and among public benefactors, we reckon him who explodes old error, as next in rank to him who discovers new truth.

You are at liberty to make any use you please of this letter.

Two letters on kindred subjects may appropriately follow in this place. Thanking M. Henri Gadeau de Kerville for his "Causeries sur le Transformisme," he writes (Feb. 1):—

DEAR SIR—Accept my best thanks for your interesting "causeries," which seem to me to give a very clear view of the present state of the evolution doctrine as applied to biology.

There is a statement on p. 87 "Après sa mort Lamarck fut complètement oublié," which may be true for France but certainly is not so for England. From 1830 onwards for more than forty years Lyell's "Principles of Geology" was one of the most widely read scientific books in this country, and it contains an elaborate criticism of Lamarck's views. Moreover, they were largely debated during the controversies which arose out of the publication of the "Vestiges of Creation" in 1844 or thereabouts. We are certainly not guilty of any neglect of Lamarck on this side of the Channel.

If I may make another criticism it is that, to my mind, atheism is, on purely philosophical grounds, untenable. That there is no evidence of the existence of such a being as the God of the theologians is true enough; but strictly scientific reasoning can take us no further. Where we know nothing we can neither affirm nor deny with propriety.

The other is in answer to the Bishop of Ripon, enclosing a few lines on the principal representatives of modern science, which he had asked for.

4 MARLBOROUGH PLACE, *June 16, 1887.*

MY DEAR BISHOP OF RIPON—I shall be very glad if I can be of any use to you now and always. But it is not an easy task to

put into half-a-dozen sentences, up to the level of your vigorous English, a statement that shall be unassailable from the point of view of a scientific fault-finder—which shall be intelligible to the general public and yet accurate.

I have made several attempts and enclose the final result. I think the substance is all right, and though the form might certainly be improved, I leave that to you. When I get to a certain point of tinkering my phrases I have to put them aside for a day or two.

Will you allow me to suggest that it might be better not to name any living man? The temple of modern science has been the work of many labourers not only in our own but in other countries. Some have been more busy in shaping and laying the stones, some in keeping off the Sanballats, some prophetwise in indicating the course of the science of the future. It would be hard to say who has done best service. As regards Dr. Joule, for example, no doubt he did more than any one to give the doctrine of the conservation of energy precise expression, but Mayer and others run him hard.

Of deceased Englishmen who belong to the first half of the Victorian epoch, I should say that Faraday, Lyell, and Darwin had exerted the greatest influence, and all three were models of the highest and best class of physical philosophers.

As for me, in part from force of circumstance and in part from a conviction I could be of most use in that way, I have played the part of something between maid-of-all-work and gladiator-general for Science, and deserve no such prominence as your kindness has assigned to me.—With our united kind regards to Mrs. Carpenter and yourself, ever yours very faithfully,

T. H. HUXLEY.

A brief note, also, to Lady Welby, dated July 25, is characteristic of his attitude towards unverified speculation.

I have looked through the paper you have sent me, but I cannot undertake to give any judgment upon it. Speculations such as you deal with are quite out of my way. I get lost the moment I lose touch of valid fact and incontrovertible demonstration and find myself wandering among large propositions, which may be quite true but which would involve me in months of work if I were to set myself seriously to find out whether, and in what sense, they are true. Moreover, at present, what little energy I possess is mortgaged to quite other occupations.

The following letter was in answer to a request which I was commissioned to forward him, that he would consent to serve on an honorary committee of the Société des Professeurs de Français en Angleterre.

*Jan. 17, 1887.*

I quite forgot to say anything about the Comité d'honneur, and as you justly remark in the present strained state of foreign politics the consequences may be serious. Please tell your colleague that I shall be "proud an' 'appy." You need not tell him that my pride and happiness are contingent on having nothing to do for the honour.

In the meantime, the ups and downs of his health are reflected in various letters of these six months. Much set up by his stay in the Isle of Wight, he writes from Shanklin on April 11 to Sir E. Frankland, describing the last meeting of the *x* Club, which the latter had not been able to attend, as he was staying in the Riviera:—

Hooker, Tyndall, and I alone turned up last Thursday. Lubbock had gone to High Elms about used up by the House of Commons, and there was no sign of Hirst.

Tyndall seemed quite himself again. In fact, we three old fogies voted unanimously that we were ready to pit ourselves against any three youngsters of the present generation in walking, climbing, or head-work, and give them odds.

I hope you are in the same comfortable frame of mind.

I had no notion that Mentone had suffered so seriously in the earthquake of 1887. Moral for architects: read your Bible and build your house upon the rock.

The sky and sea here may be fairly matched against Mentone or any other of your Mediterranean places. Also the east wind, which has been blowing steadily for ten days, and is nearly as keen as the Tramontana. Only in consequence of the long cold and drought not a leaf is out.

Shanklin, indeed, suited him so well that he had half a mind to settle there. "There are plenty of sites for building," he writes home in February, "but I have not thought of commencing a house yet." However, he gave up the idea; Shanklin was too far from town.

But though he was well enough as long as he kept out of London, a return to his life there was not possible for any



considerable time. On May 19, just before a visit to Mr. F. Darwin at Cambridge, I find that he went down to St. Albans for a couple of days, to walk; and on the 27th he betook himself, terribly ill and broken down, to the Saver-nake Forest Hotel, in hopes of getting "screwed up." This "turned out a capital speculation, a charming spick-and-span little country hostelry with great trees in front." But the weather was persistently bad, "the screws got looser rather than tighter," and again he was compelled to stay away from the *x*.

A week later, however, he writes:—

The weather has been detestable, and I got no good till yesterday, which was happily fine. Ditto to-day, so I am picking up, and shall return to-morrow, as, like an idiot as I am, I promised to take the chair at a public meeting about a Free Library for Marylebone on Tuesday evening.

I wonder if you know this country. I find it charming.

On the same day as that which was fixed for the meeting in favour of the Free Library, he had a very interesting interview with the Premier, of which he left the following notes, written at the Athenæum immediately after:—

*June 7, 1887.*

Called on Lord Salisbury by appointment at 3 P.M., and had twenty minutes' talk with him about the "matter of some public interest" mentioned in his letter of the (29th).

This turned out to be a proposal for the formal recognition of distinguished services in Science, Letters, and Art by the institution of some sort of order analogous to the *Pour le Mérite*. Lord Salisbury spoke of the anomalous present mode of distributing honours, intimated that the Queen desired to establish a better system, and asked my opinion.

I said that I should like to separate my personal opinion from that which I believed to obtain among the majority of scientific men; that I thought many of the latter were much discontented with the present state of affairs, and would highly approve of such a proposal as Lord Salisbury shadowed forth.

That, so far as my own personal feeling was concerned, it was opposed to anything of the kind for Science. I said that in Science we had two advantages—first, that a man's work is demonstrably either good or bad; and secondly, that the "con-

temporary posterity" of foreigners judges us, and rewards good work by membership of Academies and so forth.

In Art, if a man chooses to call Raphael a dauber, you can't prove he is wrong; and literary work is just as hard to judge.

I then spoke of the dangers to which science is exposed by the undue prominence and weight of men who successfully apply scientific knowledge to practical purposes—engineers, chemical inventors, etc. etc.; said it appeared to me that a Minister having such order at his disposal would find it very difficult to resist the pressure brought by such people as against the man of high science who had not happened to have done anything to strike the popular mind.

Discussed the possibility of submission of names by somebody for the approval and choice of the Crown. For Science, I thought the R.S. Council might discharge that duty very fairly. I thought that the Academy of Berlin presented people for the *Pour le Mérite*, but Lord S. thought not.

In the course of conversation I spoke of Hooker's case as a glaring example of the wrong way of treating distinguished men. Observed that though I did not personally care for or desire the institution of such honorary order, yet I thought it was a mistake in policy for the Crown as the fountain of honour to fail in recognition of that which deserves honour in the world of Science, Letters, and Art.

Lord Salisbury smilingly summed up. "Well, it seems that you don't desire the establishment of such an order, but that if you were in my place you would establish it," to which I assented.

Said he had spoken to Leighton, who thought well of the project.

It was not long, however, before he received imperative notice to quit town with all celerity. He fell ill with what turned out to be pleurisy; and after recruiting at Ilkley, went again to Switzerland.

4 MARLBOROUGH PLACE, *June 27, 1887.*

MY DEAR FOSTER— . . . I am very sorry that it will be impossible for me to attend [the meeting of committee down for the following Wednesday]. If I am well enough to leave the house I must go into the country that day to attend the funeral of my wife's brother-in-law and my very old friend Fanning, of whom I may have spoken to you. He has been slowly sinking for some time, and this morning we had news of his death.

Things have been very crooked for me lately. I had a conglomerate of engagements of various degrees of importance in the latter half of last week, and had to forego them all, by reason of a devil in the shape of muscular rheumatism of one side, which entered me last Wednesday, and refuses to be wholly exorcised (I believe it is my Jubilee Honour).\* Along with it, and I suppose the cause of it, a regular liver upset. I am very seedy yet, and even if Fanning's death had not occurred I doubt if I should have been ready to face the Tyndall dinner.

The reference to this "Tyndall dinner" is explained in the following letters, which also refer to a meeting of the London University, in which the projects of reform which he himself supported met with a smart rebuff.

4 MARLBOROUGH PLACE, *May 13, 1887.*

MY DEAR TYNDALL—I am very sorry to hear of your gout, but they say when it comes out at the toes it flies from the better parts, and that is to the good.

There is no sort of reason why unsatisfied curiosity should continue to disturb your domestic hearth; your wife will have the gout too if it goes on. "They" can't bear the strain.

The history of the whole business is this. A day or two before I spoke to you, Lockyer told me that various people had been talking about the propriety of recognising your life-long work in some way or other; that, as you would not have anything else, a dinner had been suggested, and finally asked me to inquire whether you would accept that expression of goodwill. Of course I said I would, and I asked accordingly.

After you had assented I spoke to several of our friends who were at the Athenæum, and wrote to Lockyer. I believe a strong committee is forming, and that we shall have a scientific jubilation on a large scale; but I have purposely kept in the background, and confined myself, like Bismarck, to the business of "honest broker."

But of course nothing (beyond preliminaries) can be done till you name the day, and at this time of year it is needful to

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\* On the same day he describes this to Sir J. Evans:—"I have hardly been out of the house as far as my garden, and not much off my bed or sofa since I saw you last. I have had an affection of the muscles of one side of my body, the proper name of which I do not know, but the similitude thereof is a bird of prey periodically digging in his claws and stopping your breath in a playful way."

look well ahead if a big room is to be secured. So if you can possibly settle that point, pray do.

There seems to have been some oversight on my wife's part about the invitation, but she is stating her own case. We go on a visit to Mrs. Darwin to Cambridge on Saturday week, and the Saturday after that I am bound to be at Eton.

Moreover, I have sacrificed to the public Moloch so far as to promise to take the chair at a public meeting in favour of a Free Library for Marylebone on the 7th. As Wednesday's work at the Geological Society and the soirée knocked me up all yesterday, I shall be about finished I expect on the 8th. If you are going to be at Hindhead after that, and would have us for a day, it would be jolly; but I cannot be away long, as I have some work to finish before I go abroad.

I never was so uncomfortable in my life, I think, as on Wednesday when L—— was speaking, just in front of me, at the University. Of course I was in entire sympathy with the tenor of his speech, but I was no less certain of the impolicy of giving a chance to such a master of polished putting-down as the Chancellor. You know Mrs. Carlyle said that Owen's sweetness reminded her of sugar of lead. Granville's was that plus butter of antimony!—Ever yours very faithfully,

T. H. HUXLEY.

*N.B.*—Don't swear, but get Mrs. Tyndall, who is patient and good-tempered, to read this long screed.

*May 18, 1887.*

MY DEAR TYNDALL—I was very glad to get your letter yesterday morning, and I conveyed your alteration at once to Rücker, who is acting as secretary. I asked him to communicate with you directly to save time.

I hear that the proposal has been received very warmly by all sorts and conditions of men, and that is quite apart from any action of your closer personal friends. Personally I am rather of your mind about the "dozen or score" of the faithful. But as that was by no means to the mind of those who started the project, and, moreover, might have given rise to some heart-burning, I have not thought it desirable to meddle with the process of spontaneous combustion. So look out for a big bonfire somewhere in the middle of June! I have a hideous cold, and can only hope that the bracing air of Cambridge, where we go on Saturday, may set me right.—Ever yours very faithfully,

T. H. HUXLEY.

To recover from his pleuritic "Jubilee Honour" he went for a fortnight (July 11-25) to Ilkley, which had done him so much good before, intending to proceed to Switzerland as soon as he conveniently could.

ILKLEY, *July 15, 1887.*

MY DEAR FOSTER—I was very much fatigued by the journey here, but the move was good, and I am certainly mending, though not so fast as I could wish. I expect some adhesions are interfering with my bellows. As soon as I am fit to travel I am thinking of going to Lugano, and thence to Monte Generoso. The travelling is easy to Lugano, and I know the latter place.

My notion is I had better for the present avoid the chances of a wet, cold week in the high places.

M.B.A.\* . . . As to the employment of the Grant, I think it ought to be on something definite and limited. The Pilchard question would be an excellent one to take up.

— seems to have a notion of employing it on some geological survey of Plymouth Sound, work that would take years and years to do properly, and nothing in the way of clear result to show.

I hope to be in London on my way abroad in less than ten days' time, and will let you know.—Ever yours very faithfully,

T. H. HUXLEY.

And on the same day to Sir J. Donnelly:—

I expect . . . that I shall have a slow convalescence. Lucky it is no worse!

Much fighting I am likely to do for the Unionist cause or any other! But don't take me for one of the enraged. If anybody will show me a way by which the Irish may attain all they want without playing the devil with us, I am ready to give them their own talking-shop or anything else.

But that is as much writing as I can sit up and do all at once.

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\* Marine Biological Association.

## CHAPTER XI

1887

ON the last day of July he left England for Switzerland, and did not return till the end of September. A second visit to Arolla worked a great change in him. He renewed his Gentic studies also, with unflagging ardour. The following letters give some idea of his doings and interests:—

HOTEL DU MONT COLLON, AROLLA, SWITZERLAND,  
*Aug. 28, 1887.*

MY DEAR FOSTER—I know you will be glad to hear that I consider myself completely set up again. We went to the Maderaner Thal and stayed a week there. But I got no good out of it. It is charmingly pretty, but damp; and, moreover, the hotel was 50 per cent too full of people, mainly Deutschers, and we had to turn out into the open air after dinner because the salon and fumoir were full of beds. So, in spite of all prudential considerations, I made up my mind to come here. We travelled over the Furca, and had a capital journey to Evolena. Thence I came on muleback (to my great disgust, but I could not walk a bit uphill) here. I began to get better at once; and in spite of a heavy snowfall and arctic weather a week ago, I have done nothing but mend. We have glorious weather now, and I can take almost as long walks as last year.

We have some Cambridge people here: Dr. Peile of Christ's and his family. Also Nettleship of Oxford. What is the myth about the Darwin tree in the Pall Mall? \* Dr. Peile believes it to be all a flam.

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\* "A tree planted yesterday in the centre of the circular grass-plot in the first court of Christ's College, in Darwin's honour, was 'spirited' away at night."—*P.M.G.* August 23, 1887.

Forel has just been paying a visit to the Arolla glacier for the purpose of ascertaining the internal temperature. He told me he much desired to have a copy of the Report of the Krakatoa Committee. If it is published, will you have a copy sent to him? He is Professor at Lausanne, and a very good man.

Our stay here will depend on the weather. At present it is perfect. I do not suppose we shall leave before 7th or 8th of September, and we shall get home by easy stages not much before the end of the month.—Ever yours very faithfully,  
T. H. HUXLEY.

Madder than ever on Gentians.

The following is in reply to Sir E. Frankland's enquiries with reference to the reported presence of fish in the reservoirs of one of the water-companies.

HOTEL RIGHI VAUDOIS, GLION, *Sept.* 16, 1887.

We left Arolla about ten days ago, and after staying a day at St. Maurice in consequence of my wife's indisposition, came on here where your letter just received has followed me. I am happy to say I am quite set up again, and as I can manage my 1500 or 2000 feet as well as ever, I may be pretty clear that my pleurisy has not left my lung sticking anywhere.

I will take your enquiries *seriatim*. (1) The faith of your small boyhood is justified. Eels do wander overland, especially in the wet stormy nights they prefer for migration. But so far as I know this is the habit only of good-sized, downwardly-moving eels. I am not aware that the minute fry take to the land on their journey upwards.

(2) Male eels are now well known. I have gone over the evidence myself and examined many. But the reproductive organs of both sexes remain undeveloped in fresh water—just the contrary of salmon, in which they remain undeveloped in salt water.

(3) So far as I know, no eel with fully-developed reproductive organs has yet been seen. Their matrimonial operations go on in the sea where they spend their honeymoon, and we only know the result in the shape of the myriads of thread-like eel-lets, which migrate up in the well-known "eel-fare."

(4) On general principles of eel-life I think it possible that the Inspector's theory *may* be correct. But your story about the roach is a poser. They certainly do not take to walking abroad. It reminds me of the story of the Irish milk-woman who was

confronted with a stickleback found in the milk. "Sure, then, it must have been bad for the poor cow when that came through her teat."

Surely the Inspector cannot have overlooked such a crucial fact as the presence of other fish in the reservoirs?

We shall be here another week, and then move slowly back to London. I am loth to leave this place, which is very beautiful with splendid air and charming walks in all directions—two or three thousand feet up if you like.

HOTEL RIGHI VAUDOIS, GLION, SWITZERLAND,

*Sept. 16, 1887.*

MY DEAR DONNELLY—We left Arolla for this place ten days ago, but my wife fell ill, and we had to stay a day at St. Maurice. She has been more or less out of sorts ever since until to-day. However, I hope now she is all right again.

This is a very charming place at the east end of the Lake of Geneva—1500 feet above the lake—and you can walk 3000 feet higher up if you like.

What they call a "funicular railway" hauls you up a gradient of 1 in  $1\frac{3}{4}$  from the station on the shore in ten minutes. At first the sensation on looking down is queer, but you soon think nothing of it. The air is very fine, the weather lovely, the feeding unexceptionable, and the only drawback consists in the "javelins," as old Francis Head used to call them—stinks of such wonderful crusted flavour that they must have been many years in bottle. But this is a speciality of all furrin parts that I have ever visited.

I am very well and extremely lazy so far as my head goes—legs I am willing to use to any extent up hill or down dale. They wanted me to go and speechify at Keighley in the middle of October, but I could not get permission from the authorities. Moreover, I really mean to keep quiet and abstain even from good words (few or many) next session. My wife joins with me in love to Mrs. Donnelly and yourself.

She thought she had written, but doubts whether in the multitude of her letters she did not forget.—Ever yours,

T. H. HUXLEY.

From Glion also he writes to Sir M. Foster:—

I have been doing some very good work on the Gentians in the interests of the business of being idle.

The same subject recurs in the next letter:—



HOTEL RIGHI VAUDOIS, GLION, SWITZERLAND,  
Sept. 21, 1887.

MY DEAR HOOKER—I saw in the *Times* yesterday the announcement of Mr. Symonds' death. I suppose the deliverance from so painful a malady as heart-disease is hardly to be lamented in one sense; but these increasing gaps in one's intimate circle are very saddening, and we feel for Lady Hooker and you. My wife has been greatly depressed by hearing of Mrs. Carpenter's fatal disorder. One cannot go away for a few weeks without finding somebody gone on one's return.

I got no good at the Maderaner Thal, so we migrated to our old quarters at Arolla, and there I picked up in no time, and in a fortnight could walk as well as ever. So if there are any adhesions they are pretty well stretched by this time.

I have been at the Gentians again, and worked out the development of the flower in *G. purpurea* and *G. campestris*. The results are very pretty. They both start from a thalamifloral condition, then become corollifloral, *G. purpurea* at first resembling *G. lutea* and *G. campestris*, an *Ophelia*, and then specialise to the *Ptychantha* and *Stephanantha* forms respectively.

In *G. campestris* there is another very curious thing. The anthers are at first introrse, but just before the bud opens they assume this position [sketch] and then turn right over and become extrorse. In *G. purpurea* this does not happen, but the anthers are made to open outwards by their union on the inner side of the slits of dehiscence.

There are several other curious bits of morphology that have turned up, but I reserve them for our meeting.

Beyond pottering away at my Gentians and doing a little with that extraordinary *Cynanchum* I have been splendidly idle. After three weeks of the ascetic life of Arolla, we came here to acclimatise ourselves to lower levels and to fatten up. I go straight through the *table d'hôte* at each meal, and know not indigestion.

My wife has fared not so well, but she is all right again now. We go home by easy stages, and expect to be in Marlborough Place on Tuesday.

With all our best wishes to Lady Hooker and yourself—  
Ever yours,  
T. H. HUXLEY.

The second visit to Arolla did as much good as the first. Though unable to stay more than a week or two in London

itself, he was greatly invigorated. His renewed strength enabled him to carry out vigorously such work as he had put his hand to, and still more, to endure one of the greatest sorrows of his whole life which was to befall him this autumn in the death of his daughter Marian.

The controversy which fell to his share immediately upon his return, has already been mentioned (p. 168). This was all part of the war for science which he took as his necessary portion in life; but he would not plunge into any other forms of controversy, however interesting. So he writes to his son, who had conveyed him a message from the editor of a political review:—

4 MARLBOROUGH PLACE, *Oct.* 19, 1887.

No political article from me! I have had to blow off my indignation incidentally now and then lest worse might befall me, but as to serious political controversy, I have other fish to fry. Such influence as I possess may be most usefully employed in promoting various educational movements now afoot, and I do not want to bar myself from working with men of all political parties.

So excuse me in the prettiest language at your command to Mr. A.

Nevertheless politics very soon drew him into a new conflict, in defence, be it said, of science against the possible contamination of political influences. Prof. (now Sir) G. G. Stokes, his successor in the chair of the Royal Society, accepted an invitation from the University of Cambridge to stand for election as their member of Parliament, and was duly elected. This was a step to which many Fellows of the Royal Society, and Huxley in especial, objected very strongly. Properly to fulfil the duties of both offices at once was, in his opinion, impossible. It might seem for the moment an advantage that the accredited head of the scientific world should represent its interests officially in Parliament; but the precedent was full of danger. Science being essentially of no party, it was especially needful for such a representative of science to keep free from all possible entanglements; to avoid committing science, as it were, officially to the policy of a party, or, as its inevitable conse-

quence, introducing political considerations into the choice of a future President.

During his own tenure of the Presidency Huxley had carefully abstained from any official connection with societies or public movements on which the feeling of the Royal Society was divided, lest as a body it might seem committed by the person and name of its President. He thought it a mistake that his successor should even be President of the Victoria Institute.

Thus there is a good deal in his correspondence bearing on this matter. He writes on November 6 to Sir J. Hooker:—

I am extremely exercised in my mind about Stokes' going into Parliament (as a strong party man, moreover) while still P.R.S. I do not know what you may think about it, but to my mind it is utterly wrong—and degrading to the Society—by introducing politics into its affairs.

And on the same day to Sir M. Foster:—

I think it is extremely improper for the President of the R.S. to accept a position as a party politician. As a Unionist I should vote for him if I had a vote for Cambridge University, but for all that I think it is most lamentable that the Presidency of the Society should be dragged into party mud.

When I was President I refused to take the Presidency of the Sunday League, because of the division of opinion on the subject. Now we are being connected with the Victoria Institute, and sucked into the slough of politics.

These considerations weighed heavily with several both of the older and the younger members of the Society; but the majority were indifferent to the dangers of the precedent. The Council could not discuss the matter; they waited in vain for an official announcement of his election from the President, while he, as it turned out, expected them to broach the subject.

Various proposals were discussed; but it seemed best that, as a preliminary to further action, an editorial article written by Huxley should be inserted in *Nature*, indicating what was felt by a section of the Society, and suggesting

that resignation of one of the two offices was the right solution of the difficulty.

Finally, it seemed that perhaps, after all, a "masterly inactivity" was the best line of action. Without risk of an authoritative decision of the Society "the wrong way," out of personal regard for the President, the question would be solved for him by actual experience of work in the House of Commons, where he would doubtless discover that he must "renounce either science, or politics, or existence."

This campaign, however, against a principle, was carried on without any personal feeling. The perfect simplicity of the President's attitude would have disarmed the hottest opponent, and indeed Huxley took occasion to write him the following letter, in reference to which he writes to Dr. Foster:—"I hate doing things in the dark and could not stand it any longer."

Dec. 1, 1887.

MY DEAR STOKES—When we met in the hall of the Athenæum on Monday evening I was on the point of speaking to you on a somewhat delicate topic; namely, my responsibility for the leading article on the Presidency of R.S. and politics which appeared a fortnight ago in *Nature*. But I was restrained by the reflection that I had no right to say anything about the matter without the consent of the Editor of *Nature*. I have obtained that consent, and I take the earliest opportunity of availing myself of my freedom.

I should have greatly preferred to sign the article, and its anonymity is due to nothing but my strong desire to avoid the introduction of any personal irrelevancies into the discussion of a very grave question of principle.

I may add that as you are quite certain to vote in the way that I think right on the only political questions which greatly interest me, my action has not been, and cannot be, in any way affected by political feeling.

And as there is no one of whom I have a higher opinion as a man of science—no one whom I should be more glad to serve under, and to support year after year in the Chair of the Society, and no one for whom I entertain feelings of more sincere friendship—I trust you will believe that, if there is a word in the article which appears inconsistent with these feelings, it is there by oversight, and is sincerely regretted.

During the thirty odd years we have known one another, we have often had stout battles without loss of mutual kindness. My chief object in troubling you with this letter is to express the hope that, whatever happens, this state of things may continue.—I am, yours very faithfully, T. H. HUXLEY.

*P.S.*—I am still of opinion that it is better that my authorship should not be officially recognised, but you are, of course, free to use the information I have given you in any way you may think fit.

To this the President returned a very frank and friendly reply; saying he had never dreamed of any incompatibility existing between the two offices, and urging that the Presidency ought not to constrain a man to give up his ordinary duties as a citizen. He concludes:—

And now I have stated my case as it appears to myself; let me assure you that nothing that has passed tends at all to diminish my friendship towards you. My wife heard last night that the article was yours, and told me so. I rather thought it must have been written by some hot Gladstonian. It seems, however, that her informant was right. She wishes me to tell you that she replied to her informant that she felt quite sure that if you wrote it, it was because you thought it.

To which Huxley replied:—

I am much obliged for your letter, which is just such as I felt sure you would write.

Pray thank Mrs. Stokes for her kind message. I am very grateful for her confidence in my uprightness of intention.

We must agree to differ.

It may be needful for me and those who agree with me to place our opinions on record; but you may depend upon it that nothing will be done which can suggest any lack of friendship or respect for our President.

It will be seen from this correspondence and the letter to Sir J. Donnelly of July 15 (p. 179), that Huxley was a staunch Unionist. Not that he considered the actual course of English rule there ideal; his main point was that under the circumstances the establishment of Home Rule was a distinct betrayal of trust, considering that on the strength of Government promises, an immense number of persons

had entered into contracts, had bought land, and staked their fortunes in Ireland, who would be ruined by the establishment of Home Rule. Moreover, he held that the right of self-preservation entitled a nation to refuse to establish at its very gates a power which could, and perhaps would, be a danger to its own existence. Of the capacity of the Irish peasant for self-government he had no high opinion, and what he had seen of the country, and especially the great central plain, in his frequent visits to Ireland, convinced him that the balance between subsistence and population would speedily create a new agrarian question, whatever political schemes were introduced. This was one of "the only political questions which interested him."

Towards the end of October he left London for Hastings, partly for his own, but still more for his wife's sake, as she was far from well. He was still busy with one or two Royal Society Committees, and came up to town occasionally to attend their meetings, especially those dealing with the borings in the Delta, and with Antarctic exploration. Thus he writes:—

11 EVERSFIELD PLACE, HASTINGS, *Oct. 31, 1887.*

MY DEAR FOSTER—We have been here for the last week, and are likely to be here for some time, as my wife, though mending, is getting on but slowly, and she will be as well out of London through beastly November. I shall be up on Thursday and return on Friday, but I do not want to be away longer, as it is lonesome for the wife.

I quite agree to what you propose on Committee, so I need not be there. Very glad to hear that the Council "very much applauded what we had done," and hope we shall get the £500.

I don't believe a word in increasing whale fishery, but scientifically, the Antarctic expedition would, or might be very interesting, and if the colonies will do their part, I think we ought to do ours.

You won't want me at that Committee either. Hope to see you on Thursday.—Ever yours,

T. H. HUXLEY.

Hideous pen!

But he did not come up that Thursday. His wife was for a time too ill to be left, and he winds up his letter of November 2 to Dr. Foster with the reflection:—

Man is born to trouble as the sparks, etc.—but when you have come to my time of life you will say as I do—Lucky it is no worse.

November 6.—I am very glad to hear that the £500 is granted, and I will see to what is next to be done as soon as I can. Also I am very glad to find you don't want my valuable service on Council R.S. I repented me of my offer when I thought how little I might be able to attend.

One thing, however, afforded him great pleasure at this time. He writes on November 6 to his old friend, Sir J. Hooker:—

I write just to say what infinite satisfaction the award of the Copley Medal to you has given me. If you were not my dear old friend, it would rejoice me as a mere matter of justice—of which there is none too much in this “— rum world,” as Whitworth's friend called it.

To the reply that the award was not according to rule, inasmuch as it was the turn for the medal to be awarded in another branch of science, he rejoins:—

I had forgotten all about the business—but he had done nothing to deserve the Copley, and all I can say is that if the present award is contrary to law, the “law's a hass” as Mr. Bumble said. But I don't believe that it is.

He replies also on November 5 to a clerical correspondent who had written to him on the distinction between *shehretz* and *rehmes*, and accused him of “wilful blindness” in his theological controversy of 1886:—

Let me assure you that it is not my way to set my face against being convinced by evidence.

I really cannot hold myself to be responsible for the translators of the Revised Version of the O.T. If I had given a translation of the passage to which you refer on my own authority, any mistake would be mine, and I should be bound to acknowledge it. As I did not, I have nothing to admit. I have every respect for your and Mr. —'s authority as Hebraists, but I have noticed that Hebrew scholars are apt to hold very divergent views, and before admitting either your or Mr. —'s interpretation, I should like to see the question fully discussed.

If, when the discussion is concluded, the balance of authority

is against the revised version, I will carefully consider how far the needful alterations may affect the substance of the one passage in my reply to Mr. Gladstone which is affected by it.

At present I am by no means clear that it will make much difference, and in no case will the main lines of my argument as to the antagonism between modern science and the Pentateuch be affected. The statements I have made are public property. If you think they are in any way erroneous I must ask you to take upon yourself the same amount of responsibility as I have done, and submit your objection to the same ordeal.

There is nothing like this test for reducing things to their true proportions, and if you try it, you will probably discover, not without some discomfort, that you really had no reason to ascribe wilful blindness to those who do not agree with you.

He was now preparing to complete his campaign of the spring on technical education by delivering an address to the Technical Education Association at Manchester on November 29, and looked forward to attending the anniversary meeting of the Royal Society on his way home next day, and seeing the Copley medal conferred upon his old friend, Sir J. Hooker. However, unexpected trouble befell him. First he was much alarmed about his wife, who had been ill more or less ever since leaving Arolla. Happily it turned out that there was nothing worse than could be set right by a slight operation. But nothing had been done when news came of the sudden death of his second daughter on November 19. "I have no heart for anything just now," he writes; nevertheless, he forced himself to fulfil this important engagement at Manchester, and in the end the necessity of bracing himself for the undertaking acted on him as a tonic.

It is a trifle, perhaps, but a trifle significant of the disturbance of mind that could override so firmly fixed a habit, that the two first letters he wrote after receiving the news are undated; almost the only omission of the sort I have found in all his letters of the last twenty-five years of his life.

His daughter's long illness had left him without hope for months past, but this, as he confessed, did not mend matters much. In his letters to his two most intimate



friends, he recalls her brilliant promise, her happy marriage, her "faculty for art, which some of the best artists have told me amounted to genius." But he was naturally reticent in these matters, and would hardly write of his own griefs unbidden even to old friends.

85 MARINA, ST. LEONARDS, *Nov. 21, 1887.*

MY DEAR SPENCER—You will not have forgotten my bright girl Marian, who married so happily and with such bright prospects half a dozen years ago?

Well, she died three days ago of a sudden attack of pneumonia, which carried her off almost without warning. And I cannot convey to you a sense of the terrible sufferings of the last three years better than by saying that I, her father, who loved her well, am glad that the end has come thus. . . .

My poor wife is well-nigh crushed by the blow. For though I had lost hope, it was not in the nature of things that she should.

Don't answer this—I have half a mind to tear it up—for when one is in a pool of trouble there is no sort of good in splashing other people.—Ever yours, T. H. HUXLEY.

As for his plans, he writes to Sir J. Hooker on November 21:—

I had set my heart on seeing you get the Copley on the 30th. In fact, I made the Manchester people, to whom I had made a promise to go down and address the Technical Education Association, change their day to the 29th for that reason.

I cannot leave them in the lurch after stirring up the business in the way I have done, and I must go and give my address. But I must get back to my poor wife as fast as I can, and I cannot face any more publicity than that which it would be cowardly to shirk just now. So I shall not be at the Society except in the spirit.—Ever yours, T. H. HUXLEY.

And again to Sir M. Foster:—

You cannot be more sorry than I am that I am going to Manchester, but I am not proud of chalking up "no popery" and running away—for all Evans' and your chaff—and, having done a good deal to stir up the Technical Education business and the formation of the Association, I cannot leave them in the lurch when they urgently ask for my services. . . .

The Delta business must wait till after the 30th. I have no heart for anything just now.

The letters following were written in answer to letters of sympathy.

85 MARINA, ST. LEONARDS, *Nov.* 25, 1887.

MY DEAR MR. CLODD—Let me thank you on my wife's behalf and my own for your very kind and sympathetic letter.

My poor child's death is the end of more than three years of suffering on her part, and deep anxiety on ours. I suppose we ought to rejoice that the end has come, on the whole, so mercifully. But I find that even I, who knew better, hoped against hope, and my poor wife, who was unfortunately already very ill, is quite heartbroken. Otherwise, she would have replied herself to your very kind letter.

She has never yet learned the art of sparing herself, and I find it hard work to teach her.—Ever yours very faithfully,  
T. H. HUXLEY.

In the same strain he writes to Dr. Dyster:—

Rationally we must admit that it is best so. But then, whatever Linnæus may say, man is not a rational animal—especially in his parental capacity.

85 MARINA, ST. LEONARDS, *Nov.* 25, 1887.

MY DEAR KNOWLES—I really must thank you very heartily for your letter. It went to our hearts and did us good, and I know you will like to learn that you have helped us in this grievous time.

My wife is better, but fit for very little; and I do not let her write a letter even, if I can help it. But it is a great deal harder to keep her from doing what she thinks her duty than to get most other people to do what plainly is their duty.

With our kindest love and thanks to all of you—Ever, my dear Knowles, yours very faithfully,  
T. H. HUXLEY.

Yes, you are quite right about "loyal." I love my friends and hate my enemies, which may not be in accordance with the Gospel, but I have found it a good wearing creed for honest men.

The "Address on behalf of the National Association for the Promotion of Technical Education," first published in the ensuing number of *Science and Art*, and reprinted in

*Collected Essays*, iii. 427-451, was duly delivered in Manchester, and produced a considerable effect.

He writes to Sir M. Foster, December 1:—

I am glad I resisted the strong temptation to shirk the business. Manchester has gone solid for technical education, and if the idiotic London papers, instead of giving half a dozen lines of my speech, had mentioned the solid contributions to the work announced at the meeting, they would have enabled you to understand its importance.

. . . I have the satisfaction of having got through a hard bit of work, and am none the worse physically—rather the better for having to pull myself together.

And to Sir J. Hooker:—

85 MARINA, ST. LEONARDS, Dec. 4, 1887.

MY DEAR HOOKER— $x = 8$ , 6.30. I meant to have written to you all to put off the  $x$  till next Thursday, when I could attend, but I have been so bedevilled I forgot it. I shall ask for a bill of indemnity.

I was rather used up yesterday, but am picking up. In fact my Manchester journey convinced me that there was more stuff left than I thought for. I travelled 400 miles, and made a speech of fifty minutes in a hot, crowded room, all in about twelve hours, and was none the worse. Manchester, Liverpool, and Newcastle have now gone in for technical education on a grand scale, and the work is practically done. *Nunc Dimittis!*

I hear great things of your speech at the dinner. I wish I could have been there to hear it. . . .

Of the two following letters, one refers to the account of Sir J. D. Hooker's work in connection with the award of the Copley medal; the other, to Hooker himself, touches a botanical problem in which Huxley was interested.

ST. LEONARDS, Nov. 25, 1887.

MY DEAR FOSTER— . . . I forget whether in the notice of Hooker's work you showed me there was any allusion made to that remarkable account of the Diatoms in Antarctic ice, to which I once drew special attention, but Heaven knows where?

Dyer perhaps may recollect all about the account in the *Flora Antarctica*, if I mistake not. I have always looked upon Hooker's insight into the importance of these things and their

skeletons as a remarkable piece of inquiry—anticipative of subsequent deep sea work.

Best thanks for taking so much trouble about H——. Pray tell him if ever you write that I have not answered his letter only because I awaited your reply. He may think my silence uncivil. . . .—Ever yours,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, Dec. 29, 1887.

Where is the fullest information about distribution of Coniferæ? Of course I have looked at *Genera Pl.* and De Candolle.

I have been trying to make out whether structure or climate or paleontology throw any light on their distribution—and am drawing complete blank. Why the deuce are there no Conifers but *Podocarpus* and *Widringtonias* in all Africa south of the Sahara? And why the double deuce are about three-quarters of the genera huddled together in Japan and N. China?

I am puzzling over this group because the paleontological record is comparatively so good.

I am beginning to suspect that present distribution is an affair rather of denudation than migration.

*Sequoia! Taxodium! Widringtonia! Araucaria!* all in Europe, in Mesozoic and Tertiary.

The following letters to Mr. Herbert Spencer were written as sets of proofs of his Autobiography arrived. That to Sir J. Skelton was to thank him for his book on *Maitland of Lethington*, the Scotch statesman of the time of Queen Mary.

Jan. 18, 1887.

(The first part of this letter is given on p. 161.)

MY DEAR SPENCER—I see that your proofs have been in my hands longer than I thought for. But you may have seen that I have been “starring” at the Mansion House. . . .

I am immensely tickled with your review of your own book. That is something most originally Spencerian. I have hardly any suggestions to make, except in what you say about the *Rattlesnake* work and my position on board.

Her proper business was the survey of the so-called “inner passage” between the Barrier Reef and the east coast of Australia; the New Guinea work was a *hors d'œuvre*, and dealt with only a small part of the southern coast.

Macgillivray was naturalist—I was actually Assistant-Sur-

geon and nothing else. But I was recommended to Stanley by Sir John Richardson, my senior officer at Haslar, on account of my scientific proclivities. But scientific work was no part of my duty. How odd it is to look back through the vista of years! Reading your account of me, I had the sensation of studying a fly in amber. I had utterly forgotten the particular circumstance that brought us together. Considering what wilful tykes we both are (you particularly), I think it is a great credit to both of us that we are firmer friends now than we were then. Your kindly words have given me much pleasure.

This is a deuce of a long letter to inflict upon you, but there is more coming. The other day a Miss —, a very good, busy woman of whom I and my wife have known a little for some years, sent me a proposal of the committee of a body calling itself the London Liberty League (I think) that I should accept the position of one of three honorary something or others, you and Mrs. Fawcett being the other two.

Now you may be sure that I should be glad enough to be associated with you in anything; but considering the innumerable battles we have fought over education, vaccination, and so on, it seemed to me that if the programme of the League were wide enough to take us both for figure-heads, it must be so elastic as to verge upon infinite extensibility; and that one or other of us would be in a false position.

So I wrote to Miss — to that effect, and the matter then dropped.

Misrepresentation is so rife in this world that it struck me I had better tell you exactly what happened.

On the whole, your account of your own condition is encouraging; not going back is next door to going forward. Anyhow, you have contrived to do a lot of writing.

We are all pretty flourishing, and if my wife does not get worn out with cooks falling ill and other domestic worries, I shall be content.

Now this really is the end.—Ever yours very truly,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, LONDON, N.W.,

March 7, 1887.

MY DEAR SKELTON—Wretch that I am, I see that I have never had the grace to thank you for *Maitland of Lethington* which reached me I do not choose to remember how long ago, and which I read straight off with lively satisfaction.

There is a paragraph in your preface, which I meant to have charged you with having plagiarised from an article of mine, which had not appeared when I got your book. In that Hermitage of yours you are up to any Codesicobuddhistotelepathic dodge!

It is about the value of practical discipline to historians. Half of them know nothing of life, and still less of government and the ways of men.

I am quite useless, but have vitality enough to kick and scratch a little when prodded.

I am at present engaged on a series of experiments on the thickness of skin of that wonderful little wind-bag —. The way that second-rate amateur poses as a man of science, having authority as a sort of papistical Scotch dominie, bred a minister, but stickit, really “rouses my corruption.” What a good phrase that is! I am cursed with a lot of it, and any fool can strike ile.—Ever yours very faithfully,  
T. H. HUXLEY.\*

Please remember me very kindly to Mrs. Skelton.

11 EVERSFIELD PLACE, HASTINGS, *Nov.* 18, 1887.

MY DEAR SPENCER—I was very glad to get your letter this morning. I heard all about you from Hirst before I left London, now nearly a month ago, and I promised myself that instead of bothering you with a letter I would run over from here and pay you a visit.

Unfortunately, my wife, who had been ill more or less ever since we left Arolla and came here on Clark's advice, had an attack one night, which frightened me a good deal, though it luckily turned out to arise from easily remediable causes.

Under these circumstances you will understand how I have not made my proposed journey to Brighton.

I am rejoiced to hear of your move. I believe in the skill of Dr. B. Potter and her understanding of the case more than I do in all the doctors and yourself put together. Please offer my respectful homage to that eminent practitioner.

You see people won't let me alone, and I have had to tell the Duke to “keep on board his own ship,” as the Quaker said, once more. I seek peace, but do not ensue it.

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\* This letter is one of the twelve from T. H. H. already published by Sir John Skelton in his *Table Talk of Shirley*, p. 295 sq.

Send any quantity of proofs, they are a good sign. By the way, we move to 85 Marina, St. Leonards, to-morrow.

Wife sends her kind regards.—Ever yours very faithfully,

T. H. HUXLEY.

85 MARINA, ST. LEONARDS, *Dec.* 1887.

MY DEAR SPENCER—I have nothing to criticise in the enclosed except that the itineraries seem to me rather superfluous.

I am glad to find that you forget things that have happened to you as completely as I do. I should cut almost as bad a figure as "Sir Roger" if I were cross-examined about my past life.

Your allusion to sending me the proofs made me laugh by reminding me of a particularly insolent criticism with which I once favoured you: "No objection except to the whole."

It was some piece of diabolical dialectics, in which I could pick no hole, if the premises were granted—and even then could be questioned only by an ultra-sceptic!

Do you see that the American Association of Authors has adopted a Resolution, which is a complete endorsement of my view of the stamp-swindle?

We have got our operation over, and my wife is going on very well. Overmuch anxiety has been telling on me, but I shall throw it off.—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER XII

1888

HUXLEY had returned to town before Christmas, for the house in St. John's Wood was still the rallying-point for the family, although his elder children were now married and dispersed. But he did not stay long. "Wife wonderfully better," he writes to Sir M. Foster on January 8, "self as melancholy as a pelican in the wilderness." He meant to have left London on the 16th, but his depressed condition proved to be the beginning of a second attack of pleurisy, and he was unable to start for Bournemouth till the 24th.

Here, however, his recovery was very slow. He was unable to come up to the first meeting of the *x* Club. "I trust," he writes, "I shall be able to be at the next *x*—but I am getting on very slowly. I can't walk above a couple of miles without being exhausted, and talking for twenty minutes has the same effect. I suppose it is all Anno Domini."

But he had a pleasant visit from one of the *x*, and writes:—

CASALINI, WEST CLIFF, BOURNEMOUTH, *Jan. 29, 1888.*

MY DEAR HOOKER—Spencer was here an hour ago as lively as a cricket. He is going back to town on Tuesday to plunge into the dissipations of the Metropolis. I expect he will insist on your all going to Evans' (or whatever represents that place to our descendants) after the *x*.

Bellows very creaky—took me six weeks to get them mended last time, so I suppose I may expect as long now.—Ever yours  
very faithfully,

T. H. HUXLEY.

As appears from the letters which follow, he had been busied with writing an article for the *Nineteenth Century*, for



February, on the "Struggle for Existence,"\* which on the one hand ran counter to some of Mr. Herbert Spencer's theories of society; and on the other, is noticeable as briefly enunciating the main thesis of his "Romanes Lecture" of 1893.

85 MARINA, ST. LEONARDS, Dec. 13, 1887.

MY DEAR KNOWLES—I have to go to town to-morrow for a day, so that puts an end to the possibility of getting my screed ready for January. Altogether it will be better to let it stand over.

I do not know whence the copyright extract came, except that, as Putnam's name was on the envelope, I suppose they sent it.

Pearsall Smith's practice is a wonderful commentary on his theory. Distribute the contents of the baker's shop *gratis*—it will give people a taste for bread!

Great is humbug, and it will prevail, unless the people who do not like it hit hard. The beast has no brains, but you can knock the heart out of him.—Ever yours very truly,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, Jan. 9, 1888.

MY DEAR DONNELLY—Here is my proof. Will you mind running your eye over it?

The article is long, and partly for that reason and partly because the general public wants principles rather than details, I have condensed the practical half.

H. Spencer and "Jus" will be in a white rage with me.—Ever yours very faithfully,

T. H. HUXLEY.

To Professor Frankland, February 6:—

I am glad you like my article. There is no doubt it is rather like a tadpole, with a very big head and a rather thin tail. But the subject is a ticklish one to deal with, and I deliberately left a good deal suggested rather than expressed.

CASALINI, WEST CLIFF, BOURNEMOUTH, Feb. 9, 1888.

MY DEAR DONNELLY—No! I don't think softening has begun yet—*vide* "Nature" this week.† I am glad you found the article

\* *Coll. Ess.* ix. 195.

† *Nature* (xxxvii. 337) for February 9, 1888: review of his article in the *Nineteenth Century* on the "Industrial Struggle for Existence."

worth a second go. I took a vast of trouble (as the country folks say) about it. I am afraid it has made Spencer very angry—but he knows I think he has been doing mischief this long time.

Bellows to mend! Bellows to mend! I am getting very tired of it. If I walk two or three miles, however slowly, I am regularly done for at the end of it. I expect there has been more mischief than I thought for.

How about the Bill?—Ever yours, T. H. HUXLEY.

However, he and Mr. Spencer wrote their minds to each other on the subject, and as Huxley remarks with reference to this occasion, “the process does us both good, and in no way interferes with our friendship.”

The letter immediately following, to Mr. Romanes, answers an enquiry about a passage quoted from Huxley's writings by Professor Schurman in his *Ethical Import of Darwinism*. This passage, made up of sentences from two different essays, runs as follows:—

It is quite conceivable that every species tends to produce varieties of a limited number and kind, and that the effect of natural selection is to favour the development of some of these, while it opposes the development of others along their predetermined line of modification.\* A whale does not tend to vary in the direction of producing feathers, nor a bird in the direction of producing whalebone.†

“On the strength of these extracts” (writes Mr. Romanes), “Schurman represents you ‘to presuppose design, since development takes place along certain predetermined lines of modification.’ But as he does not give references, and as I do not remember the passages, I cannot consult the context, which I fancy must give a different colouring to the extracts.”

4 MARLBOROUGH PLACE, Jan. 5, 1888.

MY DEAR ROMANES—They say that liars ought to have long memories. I am sure authors ought to. I could not at first remember where the passage Schurman quotes occurs, but I did find it in the *Encyclopædia Britannica* article on “Evolution,”\* reprinted in *Science and Culture*, p. 307.

But I do not find anything about the “whale” here. Never-

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\* *Coll. Ess.* ii. 223.

† In “Mr. Darwin's Critics,” 1871; *Coll. Ess.* ii. 181.

theless I have a consciousness of having said something of the kind somewhere.\*

If you look at the whole passage, you will see that there is not the least intention on my part to presuppose design.

If you break a piece of Iceland spar with a hammer, all the pieces will have shapes of a certain kind, but that does not imply that the Iceland spar was constructed for the purpose of breaking up in this way when struck. The atomic theory implies that of all possible compounds of A and B only those will actually exist in which the proportions of A and B by weight bear a certain numerical ratio. But it is mere arguing in a circle to say that the fact being so is evidence that it was designed to be so.

I am not going to take any more notice of the everlasting D——, as you appropriately call him, until he has withdrawn his slanders. . . .

Pray give him a dressing—it will be one of those rare combinations of duty and pleasure.—Ever yours very faithfully,  
T. H. HUXLEY.

He was, moreover, constantly interested in schemes for the reform of the scientific work of the London University, and for the enlargement of the scope and usefulness of the Royal Society. As for the latter, a proposal had been made for federation with colonial scientific societies, which was opposed by some of his friends in the *x* Club; and he writes to Sir E. Frankland on February 3:—

I am very sorry you are all against Evans' scheme. I am for it. I think it a very good proposal, and after all the talk, I do not want to see the Society look foolish by doing nothing.

You are a lot of obstructive old Tories and want routing out. If I were only younger and less indisposed to any sort of exertion, I would rout you out finely!

With respect to the former, it had been proposed that medical degrees should be conferred, not by the university, but by a union of the several colleges concerned. He writes:—

4 MARLBOROUGH PLACE, *Jan.* 11, 1888.

MY DEAR FOSTER—I send back the "Heathen Deutscher's" (whose ways are dark) letter lest I forget it to-morrow.

Meanwhile perpend these two things:—

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\* In "Mr. Darwin's Critics," 1871; *Coll. Ess.* ii. 181.

1. United Colleges propose to give just as good an examination and require as much qualification as the Scotch Universities. Why then give their degree a distinguishing mark?

2. "Academical distinctions" in medicine are all humbug. You are making a medical technical school at Cambridge—and quite right too. The United Colleges, if they do their business properly, will confer just as much, or as little "academical distinction" as Cambridge by their degree.

3. The Fellowship of the College of Surgeons is in every sense as much an "academical distinction" as the Masterships in Surgery or Doctorate of Medicine of the Scotch and English Universities.

4. You may as well cry for the moon as ask my colleagues in the Senate to meddle seriously with the Matriculation. They are possessed by the devil that cries continually, "There is only the Liberal education, and Greek and Latin are his prophets."

At Bournemouth he also applied himself to writing the Darwin obituary notice for the Royal Society, a labour of love which he had long felt unequal to undertaking. The MS. was finally sent off to the printer's on April 6, unlike the still longer unfinished memoir on *Spirula*, to which allusion is made here, among other business of the *Challenger* Committee, of which he was a member.

On February 12 he writes to Sir J. Evans:—

*Spirula* is a horrid burden on my conscience—but nobody could make head or tail of the business but myself.

That and Darwin's obituary are the chief subjects of my meditations when I wake in the night. But I do not get much "forrarder," and I am afraid I shall not until I get back to London.

Bournemouth, Feb. 14, 1888.

MY DEAR FOSTER—No doubt the Treasury will jump at any proposition which relieves them from further expense—but I cannot say I like the notion of leaving some of the most important results of the *Challenger* voyage to be published elsewhere than in the official record. . . .

Evans made a deft allusion to *Spirula*, like a powder between two dabs of jam. At present I have no moral sense, but it may awake as the days get longer.

I have been reading the *Origin* slowly again for the *n*th time, with the view of picking out the essentials of the argu-

ment, for the obituary notice. Nothing entertains me more than to hear people call it easy reading.

Exposition was not Darwin's *forte*—and his English is sometimes wonderful. But there is a marvellous dumb sagacity about him—like that of a sort of miraculous dog—and he gets to the truth by ways as dark as those of the Heathen Chinese.

I am getting quite sick of all the "paper philosophers," as old Galileo called them, who are trying to stand upon Darwin's shoulders and look bigger than he, when in point of real knowledge they are not fit to black his shoes. It is just as well I am collapsed or I believe I should break out with a final "Für Darwin."

I will think of you when I get as far as the fossils. At present I am poking over *P. sylvestris* and *P. pinnata* in the intervals of weariness.

My wife joins with me in love to you both.—Ever yours  
very faithfully,

T. H. HUXLEY.

Snow and cold winds here. Hope you are as badly off at Cambridge.

BOURNEMOUTH, *Feb.* 21, 1888.

MY DEAR FOSTER—We have had nothing but frost and snow here lately, and at present half a gale of the bitterest north-easter I have felt since we were at Florence is raging.\*

I believe I am getting better, as I have noticed that at a particular stage of my convalescence from any sort of illness I pass through a condition in which things in general appear damnable and I myself an entire failure. If that is a sign of returning health you may look upon my restoration as certain.

If it is only Murray's speculations he wants to publish separately, I should say by all means let him. But the facts, whether advanced by him or other people, ought all to be in the official record. I agree we can't stir.

I scented the "goak." How confoundedly proud you are of it! In former days I have been known to joke myself.

I will look after the questions if you like. In my present state of mind I shall be a capital critic—on Dizzy's views of critics. . . .—Ever yours,

T. H. H.

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\* Similarly to Sir J. Evans on the 28th—"I get my strength back but slowly, and think of migrating to Greenland or Spitzbergen for a milder climate.

This year Huxley was appointed a Trustee of the British Museum, an office which he had held *ex officio* from 1883 to 1885, as President of the Royal Society.

This is referred to in the following letter of March 9:—

MY DEAR HOOKER—Having nothing to do plays the devil with doing anything, and I suppose that is why I have been so long about answering your letter.

There is nothing the matter with me now except want of strength. I am tired out with a three-mile walk, and my voice goes if I talk for any time. I do not suppose I shall do much good till I get into high and dry air, and it is too early for Switzerland yet. . . .

You see I was honoured and gloried by a trusteeship of the B.M.\* These things, I suppose, normally come when one is worn-out. When Lowe was Chancellor of the Exchequer I had a long talk with him about the affairs of the Nat. Hist. Museum, and I told him that he had better put Flower at the head of it and make me a trustee to back him. Bobby no doubt thought the suggestion cheeky, but it is odd that the thing has come about now that I don't care for it, and desire nothing better than to be out of every description of bother and responsibility.

Have not Lady Hooker and you yet learned that a large country house is of all places the most detestable in cold weather? The neuralgia was a mild and kindly hint of Providence not to do it again, but I am rejoiced it has vanished.

Pronouns got mixed somehow.

With our kindest regards—Ever yours,

T. H. HUXLEY.

More last words:—What little faculty I have has been bestowed on the obituary of Darwin for R.S. lately. I have been trying to make it an account of his intellectual progress, and I hope it will have some interest. Among other things I have been trying to set out the argument of the "Origin of Species," and reading the book for the *n*th time for that purpose. It is one of the hardest books to understand thoroughly that I know of, and I suppose that is the reason why even people like Romanes get so hopelessly wrong.

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\* Replying on the 2nd to Sir John Evans' congratulations, he says:—"It is some months since Lord Salisbury made the proposal to me, and I was beginning to wonder what had happened—whether Cantuar had put his foot down for example, and objected to bad company."

If you don't mind, I should be glad if you would run your eye over the thing when I get as far as the proof stage—Lord knows when that will be.

A few days later he wrote again on the same subject, after reading the obituary of Asa Gray, the first American supporter of Darwin's theory.

*March 23.*—I suppose Dana has sent you his obituary of Asa Gray.

The most curious feature I note in it is that neither of them seems to have mastered the principles of Darwin's theory. See the bottom of p. 19 and the top of p. 20. As I understand Darwin there is nothing "Anti-Darwinian" in either of the two doctrines mentioned.

Darwin has left the causes of variation and the question whether it is limited or directed by external conditions perfectly open.

The only serious work I have been attempting lately is Darwin's obituary. I do a little every day, but get on very slowly. I have read the life and letters all through again, and the *Origin* for the sixth or seventh time, becoming confirmed in my opinion that it is one of the most difficult books to exhaust that ever was written.

I have a notion of writing out the argument of the *Origin* in systematic shape as a sort of primer of *Darwinism*. I have not much stuff left in me, and it would be as good a way of using what there is as I know of. What do you think?—Ever yours,  
T. H. HUXLEY.

In reply to this Sir J. Hooker was inclined to make the biographer alone responsible for the confusion noted in the obituary of Asa Gray. He writes:—

*March 27, 1888.*

DEAR HUXLEY—Dana's Gray arrived yesterday, and I turned to pp. 19, 20. I see nothing Anti-Darwinian in the passages, and I do not gather from them that Gray did.

I did not follow Gray into his later comments on Darwinism, and I never read his *Darwiniana*. My recollection of his attitude after acceptance of the doctrine, and during the first few years of his active promulgation of it, is that he understood it clearly, but sought to harmonise it with his prepossessions, without disturbing its physical principles in any way.

He certainly showed far more knowledge and appreciation of the contents of the *Origin* than any of the reviewers and than any of the commentators, yourself excepted.

Latterly he got deeper and deeper into theological and metaphysical wanderings, and finally formulated his ideas in an illogical fashion.

. . . Be all this as it may, Dana seems to be in a muddle on p. 20, and quite a self-sought one.—Ever yours,

J. D. HOOKER.

The following is a letter of thanks to Mrs. Humphry Ward for her novel *Robert Elsmere*.

BOURNEMOUTH, *March* 15, 1888.

MY DEAR MRS. WARD—My wife thanked you for your book which you were so kind as to send us. But that was grace before meat, which lacks the "physical basis" of after-thanks-giving—and I am going to supplement it, after my most excellent repast.

I am not going to praise the charming style, because that was in the blood and you deserve no sort of credit for it. Besides, I should be stepping beyond my last. But as an observer of the human ant-hill—quite impartial by this time—I think your picture of one of the deeper aspects of our troubled time admirable.

You are very hard on the philosophers. I do not know whether Langham or the Squire is the more unpleasant—but I have a great deal of sympathy with the latter, so I hope he is not the worst.

If I may say so, I think the picture of Catherine is the gem of the book. She reminds me of her namesake of Siena—and would as little have failed in any duty, however gruesome. You remember Sodoma's picture.

Once more, many thanks for a great pleasure.

My wife sends her love.—Ever yours very faithfully,

T. H. HUXLEY.

Meanwhile, he had been making no progress towards health; indeed, was going slowly downhill. He makes fun of his condition when writing to condole with Mr. Spencer on falling ill again after the unwonted spell of activity already mentioned; but a few weeks later discovered the cause of his weakness and depression in an affection of the heart.



This was not immediately dangerous, though he looked a complete wreck. His letters from April onwards show how he was forced to give up almost every form of occupation, and even to postpone his visit to Switzerland, until he had been patched up enough to bear the journey.

CASALINI, WEST CLIFF, BOURNEMOUTH, *March 9, 1888.*

MY DEAR SPENCER—I am very sorry to hear from Hooker that you have been unwell again. You see if young men from the country will go plunging into the dissipations of the metropolis nemesis follows.

Until two days ago, the weathercocks never overstepped N. on the one side and E. on the other ever since you left. Then they went west with sunshine and most enjoyable softness—but next S. with a gale and rain—all ablowin' and agrowin' at this present.

I have nothing to complain of so long as I do nothing; but although my hair has grown with its usual rapidity I differ from Samson in the absence of a concurrent return of strength. Perhaps that is because a male hairdresser, and no Delilah, cut it last! But I waste Biblical allusions upon you.

My wife and Nettie, who is on a visit, join with me in best wishes.

Please let me have a line to say how you are—Gladstonianly on a post-card.—Ever yours very faithfully,

T. H. HUXLEY.

BOURNEMOUTH, *April 7, 1888.*

MY DEAR FOSTER—"Let thy servant's face be white before thee." The obituary of Darwin went to Rix \* yesterday! It is not for lack of painstaking if it is not worth much, but I have been in a bad vein for work of any kind, and I thought I should never get even this simple matter ended.

I have been bothered with præcordial uneasiness and intermittent pulse ever since I have been here, and at last I got tired of it and went home the day before yesterday to get carefully overhauled. Hames tells me there is weakness and some enlargement of the left ventricle, which is pretty much what I expected. Luckily the valves are all right.

I am to go and devote myself to coaxing the left v. wall to thicken *pro rata*—among the mountains, and to have nothing to do with any public functions or other exciting bedevilmments.

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\* Assistant Secretary of the Royal Society.

So the International Geological Congress will not have the pleasure of seeing its Honorary President in September. I am disgusted at having to break an engagement, but I cannot deny that Hames is right. At present the mere notion of the thing puts me in a funk.

I wish I could get out of the chair of the M.B.A. also. . . . I know that you and Evans and Dyer will do your best, but you are all eaten up with other occupations.

Just turn it over in your mind—there's a dear good fellow—just as if you hadn't any other occupations.

With which eminently reasonable and unselfish request believe me—Ever yours,

T. H. H.

BOURNEMOUTH, *April 10, 1888.*

MY DEAR FOSTER—I send by this post the last—I hope for your sake and for that of the recording angel—of —.\* I agree to all Brady's suggestions.

With all our tinkering I feel inclined to wind up the affair after the manner of Mr. Shandy's summing [up] of the discussion about Tristram's breeches—"And when he has got 'em he'll look a beast in 'em."—Ever yours,

T. H. H.

April 12. To the same:—

I am quite willing to remain at the M.B.A. till the opening. If Evans will be President I shall be happy.

— is a very good man, but you must not expect too much of the "wild-cat" element, which is so useful in the world, in him.

I am disgusted with myself for letting everything go by the run, but there is no help for it. The least thing bowls me over just now.

CASALINI, WEST CLIFF, BOURNEMOUTH, *April 12, 1888.*

MY DEAR HOOKER—I plead not guilty.† It was agreed at the last meeting that there should be none in April—I suppose by reason of Easter, so I sent no notice. This is what Frankland told me in his letter of the 2nd. However, I see you were present, so I can't make it out.

My continual absence makes me a shocking bad Treasurer,

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\* The "Heathen Deutscherie" of p. 201. A paper of his, contributed to the Royal Society, had been under revision.

† In the matter of sending out no notices for a meeting of the x Club.

and I am sorry to say that things will be worse instead of better. Ever since this last pleuritic business I have been troubled with præcordial uneasiness. [After an account of his symptoms he continues] So I am off (with my wife) to Switzerland at the end of this month, and shall be away all the summer. We have not seen the Engadine and Tyrol yet, so we shall probably make a long circuit. It is a horrid nuisance to be exiled in this fashion. I have hardly been at home one month in the last ten. But it is of no use to growl.

Under these circumstances, would you mind looking after the  $x$  while I am away? There is nothing to do but to send the notices on Saturday previous to the meeting.

I am very grieved to hear about Hirst—though to say truth, the way he has held out for so long has been a marvel to me. The last news I had of Spencer was not satisfactory.

Eheu! the "Table Round" is breaking up. It's a great pity; we were such pleasant fellows, weren't we?—Ever yours,

T. H. HUXLEY.

CASALINI, WEST CLIFF, BOURNEMOUTH, *April 18, 1888.*

MY DEAR FOSTER—I am cheered by your liking of the notice of Darwin. I read the "Life and Letters," and the "Origin," Krause's "Life," and some other things over again in order to do it. But I have not much go in me, and I was a scandalous long time pottering over the writing.

I have sent the proof back with a variety of interpolations. I would have brought the "Spirula" notes down here to see what I could do, but I felt pretty sure that if I brought two things I should not do one. Nobody could do anything with it but myself. I will try what I can do when I go to town. How much time is there before the wind-up of the Challenger?

We go up to town Monday next, and I am thinking of being off the Monday following (Ap. 30). I have come to the same conclusion as yourself, that Glion would be better than Grindelwald. I should like very much to see you. Just drop me a line to say when you are likely to turn up.

Poor Arnold's death \* has been a great shock—rather for his wife than himself—I mean on her account than his. I have always thought sudden death to be the best of all for oneself, but under such circumstances it is terrible for those who are

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\* Matthew Arnold died suddenly of heart disease at Liverpool, where he had gone to meet his daughter on her return from America.

left. Arnold told me years ago that he had heart disease. I do not suppose there is any likelihood of an immediate catastrophe in my own case. I should not go abroad if there were. Imagine the horror of leaving one's wife to fight all the difficulties of sudden Euthanasia in a Swiss hotel! I saw enough of that two years ago at Arolla.—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *April 25*, 1888.

MY DEAR HOOKER—All my beautiful Swiss plans are knocked on the head—at any rate for the present—in favour of horizontality and *Digitalis* here. The journey up on Monday demonstrated that travelling, at present, was impracticable.

Hames is sanguine I shall get right with rest, and I am quite satisfied with his opinion, but for the sake of my belongings he thinks it right to have Clark's opinion to fortify him.

It is a bore to be converted into a troublesome invalid even for a few weeks, but I comfort myself with my usual reflection on the chances of life, "Lucky it is no worse." Any impatience would have been checked by what I heard about Moseley this morning—that he has sunk into hopeless idiocy. A man in the prime of life!—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *May 4*, 1888.

MY DEAR HOOKER—Best thanks for your note and queries.

I remember hearing what you say about Darwin's father long ago, I am not sure from what source. But if you look at p. 20 of the *Life and Letters* you will see that D. himself says his father's mind "was not scientific." I have altered the passage so as to use these exact words.

I used "malice" rather in the French sense, which is more innocent than ours, but "irony" would be better if "malice" in any way suggests malignity. "Chaff" is unfortunately beneath the dignity of an R.S. obituary.

I am going to add a short note about Erasmus Darwin's views.

It is a great comfort to me that you like the thing. I am getting nervous over possible senility—63 to-day, and nothing of your evergreen ways about me.

I am decidedly mending, chiefly to all appearance by allowing myself to be stuffed with meat and drink like a Strasburg goose. I am also very much afraid that abolishing tobacco has had something to do with my amendment.

But I am mindful of your maxim—keep a tight hold over your doctor.—Ever yours very faithfully,

T. H. HUXLEY.

*P.S.* 1.—Can't say I have sacrificed anything to penmanship, and am not at all sure about lucidity!

*P.S.* 2.—It is "Friday"—there is a dot over the i—reopened my letter to crow!

The following letter to Mr. Spencer is in answer to a note of condolence on his illness, in which the following passage occurs:—

I was grieved to hear of so serious an evil as that which [Hirst] named. It is very depressing to find one's friends as well as one's self passing more and more into invalid life.

Well, we always have one consolation, such as it is, that we have made our lives of some service in the world, and that, in fact, we are suffering from doing too much for our fellows. Such thoughts do not go far in the way of mitigation, but they are better than nothing.

4 MARLBOROUGH PLACE, *May 8, 1888.*

MY DEAR SPENCER—I have been on the point of writing to you, but put it off for lack of anything cheerful to say.

After I had recovered from my pleurisy, I could not think why my strength did not come back. It turns out that there is some weakness and dilatation of the heart, but luckily no valvular mischief. I am condemned to the life of a prize pig—physical and mental idleness, and corporeal stuffing with meat and drink, and I am certainly improving under the regimen.

I am told I have a fair chance of getting all right again. But I take it as a pretty broad hint to be quiet for the rest of my days. At present I have to be very quiet, and I spend most of my time on my back.

You and I, my dear friend, have had our innings, and carry our bats out while our side is winning. One could not reasonably ask for more. And considering the infinite possibilities of physical and moral suffering which beset us, I, for my part, am well pleased that things are no worse.—Ever yours very faithfully,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, N.W., *June 1, 1888.*

MY DEAR KNOWLES—I have been living the life of a prize pig for the last six weeks—no exercise, much meat and drink,

and as few manifestations of intelligence as possible, for the purpose of persuading my heart to return to its duty.

I am astonished to find that there is a kick left in me—even when your friend Krapotkin pitches into me without the smallest justification. *Vide XIX.*, June, p. 820.

Just look at *XIX.*, February, p. 168. I say, "*At the present time*, the produce of the soil does not suffice," etc.

I did not say a word about the capabilities of the soil if, as part and parcel of a political and social revolution on the grandest scale, we all took to spade husbandry.

As a matter of fact, I did try to find out a year or two ago, whether the soil of these islands could, under any circumstances, feed its present population with wheat. I could not get any definite information, but I understood Caird to think that it could.

In my argument, however, the question is of no moment. There must be some limit to the production of food by a given area, and there is none to population.

What a stimulus vanity is!—nothing but the vain dislike of being thought in the wrong would have induced me to trouble myself or bore you with this letter. Bother Krapotkin!

I think his article very interesting and important nevertheless.

I am getting better, but very slowly.—Ever yours very truly,  
T. H. HUXLEY.

In reply, Mr. Knowles begged him to come to lunch and a quiet talk, and further suggested, "as an *entirely unbiassed* person," that he ought to answer Krapotkin's errors in the *Ninetcenth Century*, and not only in a private letter behind his back.

The answer is as follows:—

4 MARLBOROUGH PLACE, N.W., *June 3*, 1888.

MY DEAR KNOWLES—Your invitation is tantalising. I wish I could accept it. But it is now some six weeks that my excursions have been limited to a daily drive. The rest of my time I spend on the flat of my back, eating, drinking, and doing absolutely nothing besides, except taking iron and digitalis.

I meant to have gone abroad a month ago, but it turned out that my heart was out of order, and though I am getting better, progress is slow, and I do not suppose I shall get away for some weeks yet.

I have neither brains nor nerves, and the very thought of controversy puts me in a blue funk!

My doctors prophesy good things, as there is no valvular disease, only dilatation. But for the present I must subscribe myself (from an editorial point of view)—Your worthless and useless and bad-hearted friend,  
T. H. HUXLEY.

The British Association was to meet at Plymouth this year; and Mr. W. F. Collier (an uncle of John Collier, his son-in-law) invited Huxley and any friend of his to be his guest at Horrabridge.

4 MARLBOROUGH PLACE, *June 13, 1888.*

MY DEAR MR. COLLIER—It would have been a great pleasure to me to be your guest once more, but the Fates won't have it this time.

Dame Nature has given me a broad hint that I have had my innings, and, for the rest of my time, must be content to look on at the players.

It is not given to all of us to defy the doctors and go in for a new lease, as I am glad to hear you are doing. I declare that your open invitation to any friend of mine is the most touching mark of confidence I ever received. I am going to send it to my great ally Michael Foster, Secretary of the Royal Society. I do not know whether he has made any other arrangements, and I am not quite sure whether he and his wife are going to Plymouth. But I hope they may be able to accept, for you will certainly like them, and they will certainly like you. I will ask him to write directly to you to save time.

With very kind remembrances to Mrs. Collier—Ever yours  
T. H. HUXLEY.

I forgot to say that I am mending as fast as I can expect to do.

## CHAPTER XIII

1888

It was not till June 23 that Huxley was patched up sufficiently by the doctors for him to start for the Engadine. His first stage was to Lugano; the second by Menaggio and Colico to Chiavenna; the third to the Maloja. The summer visitors who saw him arrive so feeble that he could scarcely walk a hundred yards on the level, murmured that it was a shame to send out an old man to die there. Their surprise was the greater when, after a couple of months, they saw him walking his ten miles and going up two thousand feet without difficulty. As far as his heart was concerned, the experiment of sending him to the mountains was perfectly justified. With returning strength he threw himself once more into the pursuit of gentians, being especially interested in their distribution and hybridism, and the possibility of natural hybrids explaining the apparent connecting links between species. No doubt, too, he felt some gratification in learning from his friend Mr. (now Sir W.) Thiselton Dyer, that the results he had already obtained in pursuing this hobby had been of real value:—

Your important paper "On Alpine Gentians" (writes the latter) has begun to attract the attention of botanists. It has led Baillon, who is the most acute of the French people, to make some observations of his own.

At the Maloja he stayed twelve weeks, but it was not until nearly two months had elapsed that he could write of any decided improvement, although even then his anticipations for the future were of the gloomiest. The



“secret” alluded to in the following letter is the destined award to him of the Copley medal:—

HOTEL KURSAAL, MALOJA,  
OBER ENGADINE, *Aug. 17, 1888.*

MY DEAR FOSTER—I know you will be glad to hear that, at last, I can report favourably of my progress. The first six weeks of our stay here the weather was cold, foggy, wet, and windy—in short, everything that it should not be. If the hotel had not been as it is, about the most comfortable in Switzerland, I do not know what I should have done. As it was, I got a very bad attack of “liver,” which laid me up for ten days or so. A Brighton doctor—Bluett by name, and well up to his work—kindly looked after me.

With the early days of August the weather changed for the better, and for the last fortnight we have had perfect summer—day after day. I soon picked up my walking power, and one day got up to Lake Longhin, about 2000 feet up. That was by way of an experiment, and I was none the worse for it, but usually my walks are of a more modest description. To-day we are all clouds and rain, and my courage is down to zero, with præcordial discomfort. It seems to me that my heart is quite strong enough to do all that can reasonably be required of it—if all the rest of the machinery is in good order, and the outside conditions are favourable. But the poor old pump cannot contend with grit or want of oil anywhere.

I mean to stay here as long as I can; they say it is often very fine up to the middle of September. Then we shall migrate lower, probably on the Italian side, and get home most likely in October. But I really am very much puzzled to know what to do.

My wife has not been very well lately, and Ethel has contrived to sprain her ankle at lawn-tennis. Collier has had to go to Naples, but we expect him back in a few days.

With our united love to Mrs. Foster and yourself—Ever yours,  
T. H. HUXLEY.

I was very pleased to hear of a secret my wife communicated to me. So long as I was of any use, I did not care much about having the fact recognised, but now that I am used up I like the feather in my cap. “Fuimus.” Let us have some news of you.

Sir M. Foster, who was kept in England by the British Association till September 10, wrote that he was going

abroad for the rest of September, and proposed to spend some time at Menaggio, whence he hoped to effect a meeting. He winds up with a jest at his recent unusual occupation:—"I have had no end of righteousness accounted to me for helping to entertain Bishops at Cambridge." Hence the postscript in reply:—

HOTEL KURSAAL, MALOJA, *Sept. 2, 1888.*

MY DEAR FOSTER—A sharp fall of snow has settled our minds, which have been long wavering about future plans, and we leave this for Menaggio, Hotel Vittoria, on Thursday next, 6th.\*

All the wiseacres tell us that there are fresher breezes (*vento di Lecco*) at Menaggio than anywhere else in the Como country, and at anyrate we are going to try whether we can exist there. If it does not answer, we will leave a note for you there to say where we are gone. It would be very jolly to forgather.

I am sorry to leave this most comfortable of hotels, but I do not think that cold would suit either of us. I am marvellously well so long as I am taking sharp exercise, and I do my nine or ten miles without fatigue. It is only when I am quiet that I know that I have a heart.

I do not feel at all sure how matters may be 4000 feet lower, but what I have gained is all to the good in the way of general health. In spite of all the bad weather we have had, I have nothing but praise for this place—the air is splendid, excellent walks for invalids, capital drainage, and the easiest to reach of all places 6000 feet up.

My wife sends her love, and thanks Mrs. Foster for her letter, and looks forward to meeting her.—Ever yours,

T. H. HUXLEY.

Wash yourself clean of all that episcopal contamination or you may infect me!

But adverse circumstances prevented the meeting.

HOTEL KURSAAL, MALOJA, *Sept. 24, 1888.*

MY DEAR FOSTER—As ill luck would have it, we went over to Pont Resina to-day (for the first time), and have only just got back (5.30). I have just telegraphed to you.

All our plans have been upset by the Föhn wind, which gave us four days' continuous downpour here—upset the roads, and

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\* He did not ultimately leave till the 22nd.

flooded the Chiavenna-Colico Railway. We hear that the latter is not yet repaired.

I was going to write to you at the Vittoria, but thought you could have hardly got there yet. We took rooms there a week ago, and then had to countermand them. If there are any letters kicking about for us, will you ask them to send them on?

By way of an additional complication my poor wife gave herself an unlucky strain this morning, and even if the railway is mended I do not think she will be fit to travel for two or three days. We are very disappointed. What is to be done?

I am wonderfully better. So long as I am taking active exercise and the weather is dry, I am quite comfortable, and only discover that I have a heart when I am kept quiet by bad weather or get my liver out of order. Here I can walk nine or ten miles up hill and down dale without difficulty or fatigue. What I may be able to do elsewhere is doubtful.—Ever yours,

T. H. HUXLEY.

It would do you and Mrs. Foster a great deal of good to come up here. Not out of your way at all! Oh dear no!

ZÜRICH, *Oct.* 4, 1888.

MY DEAR FOSTER—I should have written to you at Stresa, but I had mislaid your postcard, and it did not turn up till too late.

We made up our minds after all that we would as soon not go down to the Lakes—where the ground would be drying up after the inundations—so we went the other way over the Julier to Tiefenkasten, and from T. to Ragatz, where we stayed a week. Ragatz was hot and steamy at first—cold and steamy afterwards—but earlier in the season, I should think, it would be pleasant.

Last Monday we migrated here, and have had the vilest weather until to-day. All yesterday it rained cats and dogs.

To-day we are off to Neuhausen (Schweitzerhof) to have a look at the Rhine falls. If it is pleasant we may stop there a few days. Then we go to Stuttgart, on our way to Nuremberg, which neither of us have seen. We shall be at the "Bavarian Hotel," and a letter will catch us there, if you have anything to say, I daresay up to the middle of the month. After that Frankfurt, and then home.

We do not find long railway journeys very good for either of us, and I am trying to keep within six hours at a stretch.

I am not so vigorous as I was at Maloja, but still infinitely better than when I left England.

I hope the mosquitoes left something of you in Venice. When I was there in October there were none!

My wife joins with me in love to Mrs. Foster and yourself.  
—Ever yours very faithfully, T. H. HUXLEY.

Some friendly chaff in Sir M. Foster's reply to the latter contains at least a real indication of the way in which Huxley became the centre of the little society at the Maloja:—

You may reflect that you have done the English tourists a good service this summer. At most *table d'hôtes* in the Lakes I overheard people talking about the joys of Maloja, and giving themselves great airs on account of their intimacy with "Professor Huxley"!!

But indeed he made several friends here, notably one in an unexpected quarter. This was Father Steffens, Professor of Palæography in Freiburg University, resident Catholic priest at Maloja in the summer, with whom he had many discussions, and whose real knowledge of the critical questions confronting Christian theology he used to contrast with the frequent ignorance and occasional rudeness of the English representatives of that science who came to the hotel.

A letter to Mr. Spencer from Ragatz shows him on his return journey:—

In fact, so long as I was taking rather sharp exercise in sunshine I felt quite well, and I could walk as well as any time these ten years. It needed damp cold weather to remind me that my pumping apparatus was not to be depended upon under unfavourable conditions. Four thousand feet descent has impressed that fact still more forcibly upon me, and I am quite at sea as to what it will be best to do when we return. Quite certainly, however, we shall not go to Bournemouth. I like the place, but the air is too soft and moist for either of us.

I should be very glad if we could be within reach of you and help to cheer you up, but I cannot say anything definite at present about our winter doings. . . .

My wife sends her kindest regards. She is much better than when we left, which is lucky for me, as I have no mind, and

could not make it up if I had any. The only vigour I have is in my legs, and that only when the sun shines.—Ever yours,  
T. H. HUXLEY.

A curious incident on this journey deserves recording, as an instance of a futile "warning." On the night of October 6-7, Huxley woke in the night and seemed to hear an inward voice say, "Don't go to Stuttgart and Nuremberg; go straight home." All he did was to make a note of the occurrence and carry out his original plan, whereupon nothing happened.

The following to his youngest daughter, who had gone back earlier from the Maloja, refers to her success in winning the prize for modelling at the Slade School of Art.

SCHWEITZERHOF, NEUHAUSEN, *Oct. 7, 1888.*

DEAREST BABS—I will sit to you like "Pater on a monument smiling at grief" for the medallion. As to the photographs, I will try to get them done to order either at Stuttgart or Nuremberg, if we stay at either place long enough. But I am inclined to think they had better be done at home, and then you could adjust the length of the caoutchouc visage to suit your artistic convenience.

We have been crowing and flapping our wings over the medal and trimmings. The only thing I lament is that "your father's influence" was not brought to bear; there is no telling what you might have got if it had been. Thoughtless—very!!

So sorry we did not come here instead of stopping at Ragatz. The falls are really fine, and the surrounding country a wide tableland, with the great snowy peaks of the Oberland on the horizon. Last evening we had a brilliant sunset, and the mountains were lighted up with the most delicate rosy blush you can imagine.

To-day it rains cats and dogs again. You will have seen in the papers that the Rhine and the Aar and the Rhone and the Arve are all in flood. There is more water here in the falls than there has been these ten years. However, we have got to go, as the hotel shuts up to-morrow, and there seems a good chance of reaching Stuttgart without water in the carriage.

Long railway journeys do not seem to suit either of us, and we have fixed the maximum at six hours. I expect we shall be home sometime in the third week of this month.

Love to Hal and anybody else who may be at home.—Ever  
your  
PATER.

4 MARLBOROUGH PLACE, Oct. 20, 1888.

MY DEAR FOSTER—We got back on Thursday, and had a very good passage, and took it easy by staying the night at Dover. The "Lord Warden" gave us the worst dinner we have had for four months, at double the price of the good dinners. I wonder why we cannot manage these things better in England.

We are both very glad to be at home again, and trust we may be allowed to enjoy our own house for a while. But, oh dear, the air is not Malojal! not even at Hampstead, whither I walked yesterday, and the pump labours accordingly.

I found the first part of the fifth edition of the Text-book among the two or three cwt. of letters and books which had accumulated during four months. Gratulire!

By the way, S. K. has sent me some inquiry about Examinations, which I treat with contempt, as doubtless you have a duplicate.—Ever yours very faithfully,

T. H. HUXLEY.

On October 25 he announces his return to Sir Joseph Hooker, and laments his loss of vigour at the sea-level:—

Hames won't let me stay here in November, and I think we shall go to Brighton. Unless on the flat of my back, in bed, I shall not have been at home a month all this year.

I have been utterly idle. There was a lovely case of hybridism, *Gentiana lutea* and *G. punctata*, in a little island in the lake of Sils; but I fell ill and was confined to bed just after I found it out. It would be very interesting if somebody would work out Distribution five miles round the Maloja as a centre. There are the most curious local differences.

You asked me to send you a copy of my obituary of Darwin. So I put one herewith, though no doubt you have seen it in *Proc. R. S.*

I should like to know what you think of xvii-xxii. If ever I am able to do anything again I will enlarge on these heads.

In these pages of the Obituary Notice (*Proc. Roy. Soc.* XLIV., No. 269) he endeavours

to separate the substance of the theory from its accidents, and to show that a variety, not only of hostile comments, but of friendly would-be improvements lose their *raison d'être* to the careful student. . . .

It is not essential to Darwin's theory that anything more should be assumed than the facts of heredity, variation, and unlimited multiplication; and the validity of the deductive reason-

ing as to the effect of the last (that is, of the struggle for existence which it involves) upon the varieties resulting from the operation of the former. Nor is it essential that one should take up any particular position in regard to the mode of variation, whether, for example, it takes place *per saltum* or gradually; whether it is definite in character or indefinite. Still less are those who accept the theory bound to any particular views as to the causes of heredity or of variation.

The remaining letters of the year trace the gradual bettering of health, from the "no improvement" of October to the almost complete disappearance of bad symptoms in December. He had renounced Brighton, which he detested, in favour of Eastbourne, where the keen air of the downs and the daily walk over Beachy Head acted as a tolerable substitute for the Alps. Though he would not miss the anniversary meeting of the Royal Society, when he was to receive the Copley medal, one more link binding him to his old friend Hooker, he did not venture to stay for the dinner in the evening.

This autumn also he resigned his place on the board of Governors of Eton College. "I think it must be a year and a half," he writes, "since I attended a meeting, and I am not likely to do better in the future."

4 MARLBOROUGH PLACE, Oct. 28, 1888.

MY DEAR HOOKER—Best thanks for your suggestion about the cottage, viz. "that before you decide on Brighton Mrs. Huxley should come down and look at the cottage below my house" at Sunningdale, but I do not see my way to adopting it. A house, however small, involves servants and ties one to one place. The conditions that suit me do not seem to be found anywhere but in the high Alps, and I can't afford to keep a second house in the country and pass the summer in Switzerland as well.

We are going to Brighton (not because we love it, quite t'other) on account of the fine weather that is to be had there in November and December. We shall be back for some weeks about Christmas, and then get away somewhere else—Malvern possibly—out of the east winds of February and March.

I do not like this nomadic life at all, but it appears to be Hobson's choice between that and none.

I am sorry to hear you are troubled by your ears. I am so deaf that I begin to fight shy of society. It irritates me not to hear; it irritates me still more to be spoken to as if I were deaf, and the absurdity of being irritated on the last ground irritates me still more.

I wish you would start that business of giving a competent young botanist with good legs £100 to go and study distribution in the Engadine—from the Maloja as centre—in a circle of a radius of eight or ten miles. The distribution of the four principal conifers, Arolla, pine larch, mountain pine and spruce, is most curious, the why and wherefore nowise apparent.

I am very sorry I cannot be at *x* on Thursday, but they won't let me be out at night at present.—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, *Oct. 28, 1888.*

MY DEAR FOSTER—No fear of my trying to stop in London. Hames won't have it. He came and overhauled me the other day. As I expected, the original mischief is just as it was. One does not get rid either of dilatation or its results at my time of life. The only thing is to keep the pipes clear by good conditions of existence.

After endless discussion we have settled on Brighton for November and December. It is a hateful place to my mind, but there is more chance of sunshine there (at this time) than anywhere else. We shall come up for a week or two on this side of Christmas, and then get away somewhere else out of the way of the east winds of February and March.

I do not think that the Hazlemere country would do for us, nor indeed any country place so long as we cannot regularly set up house.

Heaven knows I don't want to bother about anything at present. But I should like to convince — that he does not yet understand the elements of [his subject]. What a copious inkspilling cuttlefish of a writer he is!—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, LONDON, N.W.,  
*Nov. 2, 1888.*

MY DEAR SKELTON—Best thanks for the second volume of *Maitland of Lethington*. I have been in the Engadine for the last four months, trying to repair the crazy old "home I live in," and meeting with more success than I hoped for when I left home.



Your volume turned up amidst a mountain of accumulated books, papers, and letters, and I can only hope it has not been too long without acknowledgment.

I have been much interested in your argument about the "Casket letters." The comparison of Crawford's deposition with the Queen's letter leaves no sort of doubt that the writer of one had the other before him; and under the circumstances I do not see how it can be doubted that the Queen's letter is forged.

But though thus wholly agreeing with you in substance, I cannot help thinking that your language on p. 341 may be seriously pecked at.

My experience of reporters leads me to think that there would be no discrepancy at all comparable to that between the two accounts, and I speak from the woeful memories of the many Royal Commissions I have wearied over. The accuracy of a good modern reporter is really wonderful.

And I do not think that "the two documents were drawn by the same hand." I should say that the writer of the letter had Crawford's deposition before him, and made what he considered improvements here and there.

You will say this letter is like Falstaff's reckoning, with but a pennyworth of thanks to this monstrous quantity of pecking.

But the gratitude is solid and the criticism mere two dimension stuff. It is a charming book.

With kind remembrances to Mrs. Skelton—Ever yours very faithfully,  
T. H. HUXLEY.

10 SOUTHCLIFF TERRACE, EASTBOURNE, Nov. 9, 1888.

MY DEAR FOSTER—We came here on Tuesday, on which day, by ill luck, the east wind also started, and has been blowing half a gale ever since. We are in the last house but one to the west, and as high up as we dare go—looking out on the sea. The first day we had to hold on to our chairs to prevent being blown away in the sitting-room, but we have hired a screen and can now croon over the fire without danger.

*A priori*, the conditions cannot be said to have been promising for two people, one of whom is liable to bronchitis and rheumatism and the other to pleurisy, but, as I am so fond of rubbing into Herbert Spencer, *a priori* reasonings are mostly bosh, and we are thriving.

With three coats on I find the air on Beachy Head eminently

refreshing, and there is so much light in the southern quarter just now, that we confidently hope to see the sun once more in the course of a few days.

As I told you in my official letter, I am going up for the 30th. But I am in a quandary about the dinner, partly by reason of the inevitable speech, and partly the long sitting. I should very much like to attend, and I think I could go through with it. On the other hand, my wife declares it would be very imprudent, and I am not quite sure she is wrong. I wish you would tell me exactly what you think about the matter.

The way I pick up directly I get into good air makes me suspect myself of malingering, and yet I certainly had grown very seedy in London before we left.—Ever yours,

T. H. HUXLEY.

10 SOUTHCLIFF TERRACE, EASTBOURNE, *Nov.* 13, 1888.

MY DEAR FOSTER—We are very sorry to hear about Michael Junior.\* *Experto crede*; of all anxieties the hardest to bear is that about one's children. But considering the way you got off yourself and have become the hearty and bucolic person you are, I think you ought to be cheery. Everybody speaks well of the youngster, and he is bound to behave himself well and get strong as swiftly as possible.

Though very loth, I give up the dinner. But unless I am on my back I shall turn up at the meeting. I think that is a compromise very creditable to my prudence.

Though it is blowing a gale of wind from S.W. to-day there is real sunshine, and it is fairly warm. I am very glad we came here instead of that beastly Brighton.—Ever yours very faithfully,

T. H. HUXLEY.

10 SOUTHCLIFF TERRACE, EASTBOURNE, *Nov.* 15, 1888.

MY DEAR EVANS—I am very sorry to have missed you. I told my doctor that while the weather was bad it was of no use to go away, and when it was fine I might just as well stop at home; but he did not see the force of my reasoning, and packed us off here.

The award of the Copley is a kindness I feel very much. . . .

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\* Sir M. Foster's son was threatened with lung trouble, and was ordered to live abroad. He proposed to carry his medical experience to the Maloja and practise there during the summer. Huxley offered to give him some introductions.

The Congress\* seems to have gone off excellently. I consider that my own performance of the part of dummy was distinguished.

So the Lawes business is fairly settled at last! "Lawes Deo," as the Claimant might have said. But the pun will be stale, as you doubtless have already made all possible epigrams and punnigrams on the topic.

My wife joins with me in the kindest regards to Mrs. Evans and yourself. If Mrs. Evans had only come up to the Maloja, she would have had real winter and no cold.—Ever yours very faithfully,  
T. H. HUXLEY.

10 SOUTHCLIFF TERRACE, EASTBOURNE, *Nov.* 15, 1888.

MY DEAR HOOKER—You would have it that the R.S. broke the law in giving you the Copley, and they certainly violated custom in giving it to me the year following. Who ever heard of two biologists getting it one after another? It is very pleasant to have our niches in the Pantheon close together. It is getting on for forty years since we were first "acquaint," and considering with what a very considerable dose of tenacity, vivacity, and that glorious firmness (which the beasts who don't like us call obstinacy) we are both endowed, the fact that we have never had the shadow of a shade of a quarrel is more to our credit than being ex-Presidents and Copley medallists.

But we have had a masonic bond in both being well salted in early life. I have always felt I owed a great deal to my acquaintance with the realities of things gained [in] the old Rattlesnake.

I am getting on pretty well here, though the weather has been mostly bad. All being well I shall attend the meeting of the Society on the 30th, but not the dinner. I am very sorry to miss the latter, but I dare not face the fatigue and the chances of a third dose of pleurisy.

My wife sends kindest regards and thanks for your congratulations.—Ever yours very faithfully,

T. H. HUXLEY.

10 SOUTHCLIFF TERRACE, EASTBOURNE, *Nov.* 17, 1888.

MY DEAR FLOWER— . . . Many thanks for taking my troublesomeness in good part. My friend will be greatly consoled to know that you have the poor man "in your eye."

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\* The International Geological Congress, at which he was to have presided.

Schoolmaster, naturalist, and coal merchant used to be the three refuges for the incompetent. Schoolmaster is rapidly being eliminated, so I suppose the pressure on Natural History and coals will increase.

I am glad you have got the Civil Service Commissioners to listen to common sense. I had an awful battle with them (through the Department) over Newton, who is now in your paleontological department. If I recollect rightly, they examined him *inter alia* on the working of the Poor Laws!

The Royal Society has dealt very kindly with me. They patted me on the back when I started thirty-seven years ago, and it was a great encouragement. They give me their best, now that my race is run, and it is a great consolation. At the far end of life all one's work looks so uncommonly small, that the good opinion of one's contemporaries acquires a new value.

We have a summer's day, and I am writing before an open window! Yesterday it blew great guns.—Ever yours very faithfully,  
T. H. HUXLEY.

The following letter to Lady Welby, the point of which is that to be "morally convinced" is not the same thing as to offer scientific proof, refers to an article in the *Church Quarterly* for October called "Truthfulness in Science and Religion," evoked by Huxley's *Nineteenth Century* article on "Science and the Bishops."

Nov. 27, 1888.

DEAR LADY WELBY—Many thanks for the article in the *Church Quarterly*, which I return herewith. I am not disposed to bestow any particular attention upon it; as the writer, though evidently a fair-minded man, appears to me to be entangled in a hopeless intellectual muddle, and one which has no novelty. Christian beliefs profess to be based upon historical facts. If there was no such person as Jesus of Nazareth, and if His biography given in the Gospels is a fiction, Christianity vanishes.

Now the inquiry into the truth or falsehood of a matter of history is just as much a question of pure science as the inquiry into the truth or falsehood of a matter of geology, and the value of evidence in the two cases must be tested in the same way. If any one tells me that the evidence of the existence of man in the miocene epoch is as good as that upon which I frequently act every day of my life, I reply that this is quite true, but that it is no sort of reason for believing in the existence of miocene man.

Surely no one but a born fool can fail to be aware that we constantly, and in very grave conjunctions, are obliged to act upon extremely bad evidence, and that very often we suffer all sorts of penalties in consequence. And surely one must be something worse than a born fool to pretend that such decision under the pressure of the enigmas of life ought to have the smallest influence in those judgments which are made with due and sufficient deliberation. You will see that these considerations go to the root of the whole matter. I regret that I cannot discuss the question more at length and deal with sundry topics put forward in your letter. At present writing is a burden to me.

A letter to Professor Ray Lankester mixes grave and gay in a little homily, edged by personal experience, on the virtues and vices of combativeness.

10 SOUTHCLIFF, EASTBOURNE, Dec. 6, 1888.

I think it would be a very good thing both for you and for Oxford if you went there. Oxford science certainly wants stirring up, and notwithstanding your increase in years and wisdom, I think you would bear just a little more stoning\* down, so that the conditions for a transfer of energy are excellent!

Seriously, I wish you would let an old man, who has had his share of fighting, remind you that battles, like hypotheses, are not to be multiplied beyond necessity. Science might say to you as the Staffordshire collier's wife said to her husband at the fair, "Get thee foighten done and come whoam." You have a fair expectation of ripe vigour for twenty years; just think what may be done with that capital.

No use to *tu quoque* me. Under the circumstances of the time, warfare has been my business and duty.—Ever yours very faithfully,  
T. H. HUXLEY.

Two more letters of the year refer to the South Kensington examinations, for which Huxley was still nominally responsible. As before, we see him reluctant to sign the report upon papers which he had not himself examined; yet at the same time doing all that lay in his power to assist by criticising the questions and thinking out the scheme of teaching on which the examination was to be

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\* *i.e.* "holystoning," as the decks of a man-of-war.

based. He replies to some proposed changes in a letter to Sir M. Foster of December 12:—

I am very sorry I cannot agree with your clients about the examination. They should recollect the late Master of Trinity's aphorism that even the youngest of us is not infallible.

I know exactly upon what principles I am going, and so far as I am at present informed that advantage is peculiar to my side. Two points I am quite clear about—one is the exclusion of *Amphioxus*, and the other the retention of so much of the Bird as will necessitate a knowledge of Sauropsidan skeletal characters and the elements of skeletal homologies in skull and limbs.

I have taken a good deal of pains over drawing up a new syllabus—including dogfish—and making room for it by excluding *Amphioxus* and all of bird except skeleton. I have added Lamprey (cranial and spinal skeleton, *not* face cartilages), so that the intelligent student may know what a notochord means before he goes to embryology. I have excluded *Distoma* and kept *Helix*.

The Committee must now settle the matter. I have done with it.

On December 27 he writes:—

I have been thinking over the Examinership business without coming to any very satisfactory result. The present state of things is not satisfactory so far as I am concerned. I do not like to appear to be doing what I am not doing.

— would of course be the successor indicated, if he had not so carefully cut his own throat as an Examiner. . . . He would be bringing an action against the Lord President before he had been three years in office! . . . As I told Forster, when he was Vice-President, the whole value of the Exr. system depends on the way the examiners do their work. I have the gravest doubt about — steadily plodding through the disgusting weariness of it as you and I have done, or observing any regulation that did not suit his fancy.

With this may be compared the letter of May 19, 1889, to Sir J. Donnelly, when he finally resolved to give up the "sleeping partnership" in the examination.

His last letter of the year was written to Sir J. Hooker, when transferring to him the "archives" of the  $\alpha$  Club, as the new Treasurer.

4 MARLBOROUGH PLACE, Dec. 29, 1888.

MY DEAR HOOKER—All good wishes to you and yours, and many of 'em.

Thanks for the cheque. You are very confiding to send it without looking at the account. But I have packed up the "Archives," which poor dear Busk handed over to me, and will leave them at the Athenæum for you. Among them you will find the account book. There are two or three cases, when I was absent, in which the names are not down. I have no doubt Frankland gave them to me by letter, but the book was at home and they never got set down. *Peccavi!*

I have been picking up in the most astonishing way during the last fortnight or three weeks at Eastbourne. My doctor, Hames, carefully examined my heart yesterday, and told me that though some slight indications were left, he should have thought nothing of them if he had not followed the whole history of the case. With fresh air and exercise and careful avoidance of cold and night air I am to be all right again in a few months.

I am not fond of coddling; but as Paddy gave his pig the best corner in his cabin—because "shure, he paid the rint"—I feel bound to take care of myself as a household animal of value, to say nothing of any other grounds. So, much as I should like to be with you all on the 3rd, I must defer to the taboo.

The wife got a nasty bronchitic cold as soon as she came up. She is much better now. But I shall be glad to get her down to Eastbourne again.

Except that, we are all very flourishing, as I hope you are.  
—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER XIV

1889

THE events to be chronicled in this year are, as might be expected, either domestic or literary. The letters are full of allusions to his long controversy in defence of Agnosticism, mainly with Dr. Wace, who had declared the use of the name to be a "mere evasion" on the part of those who ought to be dubbed infidels; to the building of the new house at Eastbourne, and to the marriage in quick succession of his two youngest daughters, whereby, indeed, the giving up of the house in London and definite departure from London was made possible.

All the early part of the year, till he found it necessary to go to Switzerland again, he stayed unwillingly in Eastbourne, from time to time running up to town, or having son or daughter to stay with him for a week, his wife being too busy to leave town, with the double preparations for the weddings on hand, so that he writes to her: "I feel worse than the 'cowardly agnostic' I am said to be—for leaving you to face your botherations alone." One can picture him still firm of tread, with grizzled head a little stooped from his square shoulders, pacing the sea wall with long strides, or renewing somewhat of his strength as it again began to fail, in the keener air of the downs, warmly defended against chill by a big cap—for he had been suffering from his ears—and a long rough coat. He writes (February 22): "I have bought a cap with flaps to protect my ears. I look more 'doggy' than ever." And on March 3:—



We have had a lovely day, quite an Italian sky and sea, with a good deal of Florentine east wind. I walked up to the Signal House, and was greatly amused by a young sheep-dog whose master could hardly get him away from circling round me and staring at me with a short dissatisfied bark every now and then. It is the undressed wool of my coat bothers all the dogs. They can't understand why a creature which smells so like a sheep should walk on its hind legs. I wish I could have relieved that dog's mind, but I did not see my way to an explanation.

From this time on, the effects of several years' comparative rest became more perceptible. His slowly returning vigour was no longer sapped by the unceasing strain of multifarious occupations. And if his recurrent ill-health sometimes seems too strongly insisted on, it must be remembered that he had always worked at the extreme limit of his powers—the limit, as he used regretfully to say, imposed on his brain by his other organs—and that after his first breakdown he was never very far from a second. When this finally came in 1884, his forces were so far spent that he never expected to recover as he did.

In the marriage this year of his youngest daughter, Huxley was doomed to experience the momentary little twinge which will sometimes come to the supporter of an unpopular principle when he first puts it into practice among his own belongings.

ATHENÆUM CLUB, *Jan.* 14, 1889.

MY DEAR HOOKER—I have left the *x* "Archives" here for you. I left them on my table by mischance when I came here on the *x* day.

I have a piece of family news for you. My youngest daughter Ethel is going to marry John Collier.

I have always been a great advocate for the triumph of common sense and justice in the "Deceased Wife's Sister" business—and only now discover, that I had a sneaking hope that all of my own daughters would escape that experiment!

They are quite suited to one another and I would not wish a better match for her. And whatever annoyances and social pin-pricks may come in Ethel's way, I know nobody less likely to care about them.

We shall have to go to Norway, I believe, to get the business done.

In the meantime, my wife (who has been laid up with bronchitic cold ever since we came home) and I have had as much London as we can stand, and are off to-morrow to Eastbourne again, but to more sheltered quarters.

I hope Lady Hooker and you are thriving. Don't conceal the news from her, as my wife is always accusing me of doing.  
—Ever yours,  
T. H. HUXLEY.

### TO MR. W. F. COLLIER

4 MARLBOROUGH PLACE, *Jan. 24, 1889.*

Many thanks for your kind letter. I have as strong an affection for Jack as if he were my own son, and I have felt very keenly the ruin we involuntarily brought upon him—by our poor darling's terrible illness and death. So that if I had not already done my best to aid and abet other people in disregarding the disabilities imposed by the present monstrous state of the law, I should have felt bound to go as far as I could towards mending his life. Ethel is just suited to him. . . . Of course I could have wished that she should be spared the petty annoyances which she must occasionally expect. But I know of no one less likely to care for them.

Your Shakespere parable\* is charming—but I am afraid it must be put among the endless things that are read *in* to the "divine Williams" as the Frenchman called him.

There was no knowledge of the sexes of plants in Shakespere's time, barring some vague suggestion about figs and dates. Even in the 18th century, after Linnæus, the observations of Sprengel, who was a man of genius, and first properly explained the action of insects, were set aside and forgotten.

I take it that Shakespere is really alluding to the "enforced chastity" of Dian (the moon). The poets ignore that little Endymion business when they like!

I have recovered in such an extraordinary fashion that I can plume myself on being an "interesting case," though I am not going to compete with you in that line. And if you look

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\* The second part of the latter replies to the question whether Shakespere had any notion of the existence of the sexes in plants and the part played in their fertilisation by insects, which, of course, would be prevented from visiting them by rainy weather, when he wrote in the *Midsummer Night's Dream*—

The moon, methinks, looks with a watery eye,  
And when she weeps, weeps every little flower,  
Lamenting some enforced chastity.

at the February *Nineteenth* I hope you will think that my brains are none the worse. But perhaps that conceited speech is evidence that they are.

We came to town to make the acquaintance of Nettie's *fiancé*, and I am happy to say the family takes to him. When it does not take to anybody, it is the worse for that anybody.

So, before long, my house will be empty, and as my wife and I cannot live in London, I think we shall pitch our tent in Eastbourne. Good Jack offers to give us a *pied à terre* when we come to town. To-day we are off to Eastbourne again. Carry off Harry, who is done up from too zealous Hospital work. However, it is nothing serious.

The following is in reply to a request that he would write a letter, as he describes it elsewhere, "about the wife's sister business—for the edification of the peers."

3 JEVINGTON GARDENS, EASTBOURNE,  
*March 12, 1889.*

MY DEAR DONNELLY—I feel "downright mean," as the Yankees say, that I have not done for the sake of right and justice what I am moved to do now that I have a personal interest in the matter of the directest kind; and I rather expect that will be thrown in my teeth if my name is at the bottom of anything I write.

On the other hand, I loathe anonymity. However, we can take time to consider that point.

Anyhow I will set to work on the concoction of a letter, if you will supply me with the materials which will enable me to be thoroughly posted up in the facts.

I have just received your second letter. Pity you could not stay over yesterday—it was very fine.—Ever yours very faithfully,  
T. H. HUXLEY.

The letter in question is as follows:—

*April 30, 1889.*

DEAR LORD HARTINGTON—I am assured by those who know more about the political world than I do, that if Lord Salisbury would hold his hand and let his party do as they like about the D.W.S. Bill which is to come on next week, it would pass. Considering the irritation against the bishops and a certain portion of the lay peers among a number of people who have the means of making themselves heard and felt, which is kept up and

aggravated, as time goes on, by the action of the Upper House in repeatedly snubbing the Lower, about this question, I should have thought it (from a Conservative point of view) good policy to heal the sore.

The talk of Class *v*. Mass is generally mere clap-trap; but, in this case, there is really no doubt that a fraction of the Classes stands in the way of the fulfilment of a very reasonable demand on the part of the Masses.

A clear-headed man like Lord Salisbury would surely see this if it were properly pressed on his attention.

I do not presume to say whether it is practicable or convenient for the Leader of the Liberal Unionist party to take any steps in this direction; and I should hardly have ventured to ask you to take this suggestion into consideration if the interest I have always taken in the D.W.S. Bill had not recently been quickened by the marriage of one of my daughters as a Deceased Wife's Sister.—I am, etc.

Meantime the effect of Eastbourne, which Sir John Donnelly had induced him to try, was indeed wonderful. He found in it the place he had so long been looking for. References to his health read very differently from those of previous years. He walked up Beachy Head regularly without suffering from any heart symptoms. And though Beachy Head was not the same thing as the Alps, it made a very efficient substitute for a while, and it was not till April that the need of change began to make itself felt. And so he made up his mind to listen no more to the eager friends who wished him to pitch his tent near them at either end of Surrey, but to settle down at Eastbourne, and, by preference, to build a house of the size and on the spot that suited himself, rather than to take any existing house lower down in the town. He must have been a trifle irritated by unsolicited advice when he wrote the following:—

It is very odd that people won't give one credit for common sense. We have tried one winter here, and if we tried another we should be just as much dependent upon the experience of longer residents as ever we were. However, as I told X. I was going to settle matters to-morrow, there won't be any opportunity for discussing that topic when he comes. If we had taken W.'s house, somebody would have immediately told us that we

had chosen the dampest site in winter and the stuffiest in summer, and where, moreover, the sewage has to be pumped up into the main drain.

He finally decided upon a site on the high ground near Beachy Head, a little way back from the sea front, at the corner of the Staveley and Buxton Roads, with a guarantee from the Duke of Devonshire's agent that no house should be built at the contiguous end of the adjoining plot of land in the Buxton Road, a plot which he himself afterwards bought. The principal rooms were planned for the back of the house, looking S.W. over open gardens to the long line of downs which culminate in Beachy Head, but with due provision against southerly gales and excess of sunshine.

On May 29 the builder's contract was accepted, and for the rest of the year the progress of the house, which was designed by his son-in-law, F. W. Waller, afforded a constant interest.

Meantime, with the improvement in his general health, the old appetite for work returned with increased and unwonted zest. For the first time in his life he declares that he enjoyed the process of writing. As he wrote somewhat later to his newly married daughter from Eastbourne, where he had gone again very weary the day after her wedding: " Luckily the bishops and clergy won't let me alone, so I have been able to keep myself pretty well amused in replying." The work which came to him so easily and pleasantly was the defence of his attitude of agnosticism against the onslaught made upon it at the previous Church Congress by Dr. Wace, the Principal of King's College, London, and followed up by articles in the *Nineteenth Century* from the pen of Mr. Frederic Harrison and Mr. Laing, the effect of which upon him he describes to Mr. Knowles on December 30, 1888:—

I have been stirred up to the boiling pitch by Wace, Laing, and Harrison *in re* Agnosticism, and I really can't keep the lid down any longer. Are you minded to admit a goring article into the February *Nineteenth*?

As for his health, he adds:—

I have amended wonderfully in the course of the last six weeks, and my doctor tells me I am going to be completely patched up—seams caulked and made seaworthy, so the old hulk may make another cruise.

We shall see. At any rate I have been able and willing to write lately, and that is more than I can say for myself for the first three-quarters of the year.

. . . I was so pleased to see you were in trouble about your house. Good for you to have a taste of it for yourself.

To this controversy he contributed four articles; three directly in defence of Agnosticism, the fourth on the value of the underlying question of testimony to the miraculous.

The first article, "Agnosticism," appeared in the February number of the *Nineteenth Century*. No sooner was this finished than he began a fresh piece of work, "which," he writes, "is all about miracles, and will be rather amusing." This, on the "Value of Testimony to the Miraculous," appeared in the following number of the *Nineteenth Century*. It did not form part of the controversy on hand, though it bore indirectly upon the first principles of agnosticism. The question at issue, he urges, is not the possibility of miracles, but the evidence to their occurrence, and if from preconceptions or ignorance the evidence be worthless the historical reality of the facts attested vanishes. The cardinal point, then, "is completely, as the author of *Robert Elsmere* says, the value of testimony."

The March number also contained replies from Dr. Wace and Bishop Magee on the main question, and an article by Mrs. Humphry Ward on a kindred subject to his own, "The New Reformation." Of these he writes on February 27:—

The Bishop and Wace are hammering away in the *Nineteenth*. Mrs. Ward's article very good, and practically an answer to Wace. Won't I stir them up by and by!

And a few days later:—

Mrs. Ward's service consists in her very clear and clever exposition of critical results and methods.

3 JEVINGTON GARDENS, EASTBOURNE,  
Feb. 29, 1889.

MY DEAR KNOWLES—I have just been delighted with Mrs. Ward's article. She has swept away the greater part of Wace's sophistries as a dexterous and strong-wristed housemaid sweeps away cobwebs with her broom, and saved a lot of time.

What in the world does the Bishop mean by saying that I have called Christianity "sorry stuff" (p. 370)? To my knowledge I never so much as thought anything of the kind, let alone saying it.

I shall challenge him very sharply about this, and if, as I believe, he has no justification for his statement, my opinion of him will be very considerably lowered.

Wace has given me a lovely opening by his profession of belief in the devils going into the swine. I rather hoped I should get this out of him.

I find people are watching the game with great interest, and if it should be possible for me to give a little shove to the "New Reformation" I shall think the fag end of my life well spent.

After all, the reproach made to the English people that "they care for nothing but religion and politics" is rather to their credit. In the long run these are the two things that ought to interest a man more than any others.

I have been much bothered with ear-ache lately, but if all goes well I will send you a screed by the middle of March.

Snowing hard! They have had more snow within the last month than they have known for ten years here.—Ever yours faithfully,  
T. H. HUXLEY.

He set to work immediately, and within ten day despatched his second contribution, "Agnosticism, a Rejoinder," which appeared in the April number of the *Nineteenth Century*.

On March 3 he writes:—

I am possessed by a writing demon, and have pretty well finished in the rough another article for Knowles, whose mouth is wide open for it.

And on the 9th:—

I sent off another article to Knowles last night—a regular facer for the clericals. You can't think how I enjoy writing now for the first time in my life.

He writes at greater length to Mr. Knowles:—

3 JEVINGTON GARDENS, EASTBOURNE,  
*March 10, 1889.*

MY DEAR KNOWLES—There's a Divinity that shapes the ends (of envelopes!) rough-hew them how we will. This time I went and bought the strongest to be had, and sealed him up with wax in the shop. I put no note inside, meaning to write to you afterwards, and then I forgot to do so.

I can't understand Peterborough nohow. However, so far as the weakness of the flesh would permit me to abstain from smiting him and his brother Amalekite, I have tried to turn the tide of battle to matters of more importance.

The pith of my article is the proposition that Christ was not a Christian. I have not ventured to state my thesis exactly in that form—fearing the Editor—but, in a mild and proper way, I flatter myself I have demonstrated it. Really, when I come to think of the claims made by orthodox Christianity on the one hand, and of the total absence of foundation for them on the other, I find it hard to abstain from using a phrase which shocked me very much when Strauss first applied it to the Resurrection, “*Welthistorischer Humbug!*”

I don't think I have ever seen the portrait you speak of. I remember the artist—a clever fellow, whose name, of course, I forget—but I do not think I saw his finished work. Some of these days I will ask to see it.

I was pretty well finished after the wedding, and bolted here the next day. I am sorry to say I could not get my wife to come with me. If she does not knock up I shall be pleasantly surprised. The young couple are flourishing in Paris. I like what I have seen of him very much.

What is the “*Cloister scheme*”?\* Recollect how far away I am from the world, the flesh and the d—.

Are you and Mrs. Knowles going to imitate the example of Eginhard and Emma? What good pictures you will have in your monastery church!—Ever yours very faithfully,

T. H. HUXLEY.

And again, a few days later:—

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\* It referred to a plan for using the cloisters of Westminster Abbey to receive the monuments of distinguished men, so as to avoid the necessity of enlarging the Abbey itself.



3 JEVINGTON GARDENS, EASTBOURNE,  
*March 15, 1889.*

MY DEAR KNOWLES—I am sending my proof back to Spottiswoode's. I did not think the MS. would make so much, and I am afraid it has lengthened in the process of correction.

You have a reader in your printer's office who provides me with jokes. Last time he corrected, where my MS. spoke of the pigs as unwilling "porters" of the devils, into "porkers." And this time, when I, writing about the Lord's Prayer, say "current formula," he has it "canting formula." If only Peterborough had got hold of that! And I am capable of overlooking anything in a proof.

You see we have got to big questions now, and if these are once fairly before the general mind all the King's horses and all the King's men won't put the orthodox Humpty Dumpty where he was before.—Ever yours very faithfully,

T. H. HUXLEY.

After the article came out he wrote again to Mr. Knowles:—

4 MARLBOROUGH PLACE, N.W., *April 14, 1889.*

MY DEAR KNOWLES—I am going to try and stop here, desolate as the house is now all the chicks have flown, for the next fortnight. Your talk of the inclemency of Torquay is delightfully consoling. London has been vile.

I am glad you are going to let Wace have another "go." My object, as you know, in the whole business has been to rouse people to think. . . .

Considering that I got named in the House of Commons last night as an example of a temperate and well-behaved blasphemer,\* I think I am attaining my object.

Of course I go for a last word, and I am inclined to think that whatever Wace may say, it may be best to get out of the region of controversy as far as possible and hammer in two big nails—(1) that the Demonology of Christianity shows that its founders knew no more about the spiritual world than anybody else, and (2) that Newman's doctrine of "Development" is true to an extent of which the Cardinal did not dream.

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\* In the debate upon the Religions Prosecutions Abolition Bill, Mr. Addison said "the last article by Professor Huxley in the *Nineteenth Century* showed that opinion was free when it was honestly expressed."—*Times*, April 14.

I have been reading some of his works lately, and I understand now why Kingsley accused him of growing dishonesty.

After an hour or two of him I began to lose sight of the distinction between truth and falsehood.—Ever yours,

T. H. HUXLEY.

If you are at home any day next week I will look in for a chat.

The controversy was completed by a third article, "Agnosticism and Christianity," in the June number of the *Nineteenth Century*. There was a humorous aspect of this article which tickled his fancy immensely, for he drove home his previous arguments by means of an authority whom his adversaries could not neglect, though he was the last man they could have expected to see brought up against them in this connection—Cardinal Newman. There is no better evidence for ancient than for modern miracles, he says in effect; let us therefore accept the teachings of the Church which maintains a continuous tradition on the subject. But there is a very different conclusion to be drawn from the same premises; all may be regarded as equally doubtful, and so he writes on May 30 to Sir J. Hooker:—

By the way, I want you to enjoy my wind-up with Wace in this month's *Nineteenth* in the reading as much as I have in the writing. It's as full of malice \* as an egg is full of meat, and my satisfaction in making Newman my accomplice has been unutterable. That man is the slipperiest sophist I have ever met with. Kingsley was entirely right about him.

Now for peace and quietness till after the next Church Congress!

Three other letters to Mr. Knowles refer to this article.

4 MARLBOROUGH PLACE, N.W., May 4, 1889.

MY DEAR KNOWLES—I am at the end of my London tether, and we go to Eastbourne (3 Jevington Gardens again) on Monday.

I have been working hard to finish my paper, and shall send it to you before I go.

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\* *i.e.* in the French sense of the word.

I am astonished at its meekness. Being reviled, I revile not; not an exception, I believe, can be taken to the wording of one of the venomous paragraphs in which the paper abounds. And I perceive the truth of a profound reflection I have often made, that reviling is often morally superior to not reviling.

I give up Peterborough. His "Explanation" is neither straightforward, nor courteous, nor prudent. Of which last fact, it may be, he will be convinced when he reads my acknowledgment of his favours, which is soft, not with the softness of the answer which turneth away wrath, but with that of the pillow which smothered Desdemona.—Ever yours very faithfully,  
T. H. HUXLEY.

I shall try to stand an hour or two of the Academy dinner, and hope it won't knock me up.

4 MARLBOROUGH PLACE, N.W., *May 6, 1889.*

MY DEAR KNOWLES—If I had not gone to the Academy dinner I might have kept my promise about sending you my paper to-day. I indulged in no gastronomic indiscretions, and came away after H.R.H.'s speech, but I was dead beat all yesterday, nevertheless.

We are off to Eastbourne, and I will send the MS. from there; there is very little to do.

Such a waste! I shall have to omit a paragraph that was really a masterpiece.

For who should I come upon in one of the rooms but the Bishop! As we shook hands, he asked whether that was before the fight or after; and I answered, "A little of both." Then we spoke our minds pretty plainly; and then we agreed to bury the hatchet.\*

So yesterday I tore up *the* paragraph. It was so appropriate I could not even save it up for somebody else!—Ever yours,

T. H. HUXLEY.

3 JEVINGTON GARDENS, EASTBOURNE,  
*May 22, 1889.*

MY DEAR KNOWLES—I sent back my proof last evening. I shall be in town Friday afternoon to Monday morning next, having a lot of things to do. So you may as well let me see a revise of the whole. Did you not say to me, "sitting by a

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\* As he says (*Coll. Ess.* v. 210), this chance meeting ended "a temporary misunderstanding with a man of rare ability, candour, and wit, for whom I entertained a great liking and no less respect."

sea-coal fire" (I say nothing about a "parcel gilt goblet"), that this screed was to be the "last word"? I don't mind how long it goes on so long as I have the last word. But you must expect nothing from me for the next three or four months. We shall be off abroad, not later than the 8th June, and among the everlasting hills, a fico for your controversies! Wace's paper shall be waste paper for me. Oh! This is a "goak" which Peterborough would not understand.

I think you are right about the wine and water business—I had my doubts—but it was too tempting. All the teetotallers would have been on my side.

There is no more curious example of the influence of education than the respect with which this poor bit of conjuring is regarded. Your genuine pietist would find a mystical sense in thimblery. I trust you have properly enjoyed the extracts from Newman. That a man of his intellect should be brought down to the utterance of such drivell—by Papistry, is one of the strongest of arguments against that damnable perverter of mankind, I know of.—Ever yours very faithfully,

T. H. HUXLEY.

Shortly afterwards, he received a long and rambling letter in connection with this subject. Referring to the passage in the first article, "the apostolic injunction to 'suffer fools gladly' should be the rule of life of a true agnostic," the writer began by begging him "to 'suffer gladly' one fool more," and after several pages wound up with a variation of the same phrase. It being impossible to give any valid answer to his hypothetical inquiries, Huxley could not resist the temptation to take the opening thus offered him, and replied:—

SIR—I beg leave to acknowledge your letter. I have complied with the request preferred in its opening paragraph.—Faithfully yours,

T. H. HUXLEY.

The following letter also arises out of this controversy:—

Its occasion (writes Mr. Taylor) was one which I had written on seeing an article in which he referred to the Persian sect of the Bâbis. I had read with much interest the account of it in Count Gobineau's book, and was much struck with the points of likeness to the foundation of Christianity, and the

contrast between the subsequent history of the two; I asked myself how, given the points of similarity, to account for the contrast; is it due to the Divine within the one, or the human surroundings? This question I put to Professor Huxley, with many apologies for intruding on his leisure, and a special request that he would not suffer himself to be further troubled by any reply.

### TO MR. ROBERT TAYLOR

4 MARLBOROUGH PLACE, N.W., *June 3, 1889.*

SIR—IN looking through a mass of papers, before I leave England for some months among the mountains in search of health, I have come upon your letter of 7th March. As a rule I find that out of the innumerable letters addressed to me, the only ones I wish to answer are those the writers of which are considerate enough to ask that they may receive no reply, and yours is no exception.

The question you put is very much to the purpose: a proper and full answer would take up many pages; but it will suffice to furnish the heads to be filled up by your own knowledge.

1. The Church founded by Jesus has *not* made its way; has *not* permeated the world—but *did* become extinct in the country of its birth—as Nazarenism and Ebionism.

2. The Church that did make its way and coalesced with the State in the 4th century had no more to do with the Church founded by Jesus than Ultramontaniam has with Quakerism. It is Alexandrian Judaism and Neoplatonistic mystagogy, and as much of the old idolatry and demonology as could be got in under new or old names.

3. Paul has said that the Law was schoolmaster to Christ with more truth than he knew. Throughout the Empire the synagogues had their cloud of Gentile hangers-on—those who “feared God”—and who were fully prepared to accept a Christianity, which was merely an expurgated Judaism and the belief in Jesus as the Messiah.

4. The Christian “Sodalities” were not merely religious bodies, but friendly societies, burial societies, and guilds. They hung together for all purposes—the mob hated them as it now hates the Jews in Eastern Europe, because they were more frugal, more industrious, and lived better lives than their neighbours, while they stuck together like Scotchmen.

If these things are so—and I appeal to your knowledge of

history that they are so—what has the success of Christianity to do with the truth or falsehood of the story of Jesus?—I am,  
yours very faithfully,  
T. H. HUXLEY.

The following letter was written in reply to one from Mr. Clodd on the first of the articles in this controversy. This article, it must be remembered, not only replied to Dr. Wace's attack, but at the same time bantered Mr. Frederic Harrison's pretensions on behalf of Positivism at the expense alike of Christianity and Agnosticism.

3 JEVINGTON GARDENS, EASTBOURNE

Feb. 19, 1889.

MY DEAR MR. CLODD—I am very much obliged to you for your cheery and appreciative letter. If I do not empty all Harrison's vials of wrath I shall be astonished! But of all the sickening humbugs in the world, the sham pietism of the Positivists is to me the most offensive.

I have long been wanting to say my say about these questions, but my hands were too full. This time last year I was so ill that I thought to myself, with Hamlet, "the rest is silence." But my wiry constitution has unexpectedly weathered the storm, and I have every reason to believe that with renunciation of the devil and all his works (*i.e.* public speaking, dining and being dined, etc.) my faculties may be unimpaired for a good spell yet. And whether my lease is long or short, I mean to devote them to the work I began in the paper on the Evolution of Theology.

You will see in the next *Nineteenth* a paper on the Evidence of Miracles, which I think will be to your mind.

Hutton is beginning to drivel.\* There really is no other word for it.—Ever yours very faithfully,

T. H. HUXLEY.

TO THE SAME

4 MARLBOROUGH PLACE, *April 15, 1889.*

MY DEAR MR. CLODD—The adventurous Mr. C. wrote to me some time ago. I expressed my regret that I could do nothing

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\* This refers to an article in the *Spectator* on "Professor Huxley and Agnosticism," Feb. 9, 1889, which suggests, with regard to demoniac possession, that the old doctrine of one spirit driving out another is as good as any new explanation, and fortifies this conclusion by a reference to the phenomena of hypnotism.

for the evolution of tent-pegs. What wonderful people there are in the world!

Many thanks for calling my attention to "Antiqua Mater." I will look it up. I have such a rooted objection to returning books, that I never borrow one or allow anybody to lend me one if I can help it.

I hear that Wace is to have another innings, and I am very glad of it, as it will give me the opportunity of putting the case once more as a connected argument.

It is Baur's great merit to have seen that the key to the problem of Christianity lies in the Epistle to the Galatians. No doubt he and his followers rather overdid the thing, but that is always the way with those who take up a new idea.

I have had for some time the notion of dealing with the "Three great myths"—1. Creation; 2. Fall; 3. Deluge; but I suspect I am getting to the end of my tether physically, and shall have to start for the Engadine in another month's time.

Many thanks for your congratulations about my daughter's marriage. No two people could be better suited for one another, and there is a charming little grand-daughter of the first marriage to be cared for.—Ever yours very faithfully,

T. H. HUXLEY.

One more piece of writing dates from this time. He writes to his wife on March 2:—

A man who is bringing out a series of portraits of celebrities, with a sketch of their career attached, has bothered me out of my life for something to go with my portrait, and to escape the abominable bad taste of some of the notices, I have done that. I shall show it you before it goes back to Engel in proof.

This sketch of his life is the brief autobiography which is printed at the beginning of vol. i. of the *Collected Essays*. He was often pressed, both by friends and by strangers, to give them some more autobiography; but moved either by dislike of any approach to egotism, or by the knowledge that if biography is liable to give a false impression, autobiography may leave one still more false, he constantly refused to do so especially so long as he had capacity for useful work. I found, however, among his papers, an entirely different sketch of his early life, half-a-dozen sheets describing the time he spent in the East end, with an almost Carlylese

sense of the horrible disproportions of life. I cannot tell whether this was a first draft for the present autobiography, or the beginnings of a larger undertaking.

Several letters of miscellaneous interest were written before the move to the Engadine took place. They touch on such points as the excessive growth of scientific clubs, the use of alcohol for brain workers, advice to one who was not likely to "suffer fools gladly" about applying for the assistant secretaryship of the British Association, and the question of the effects of the destruction of immature fish, besides personal matters.

3 JEVINGTON GARDENS, EASTBOURNE,  
March 22, 1889.

MY DEAR HOOKER—I suppose the question of amalgamation with the Royal is to be discussed at the Phil. Club. The sooner something of the kind takes place the better. There is really no *raison d'être* left for the Phil. Club, and considering the hard work of scientific men in these days, clubs are like hypotheses, not to be multiplied beyond necessity.—Ever yours,

T. H. HUXLEY.

4 MARLBOROUGH PLACE, March 26, 1889.

MY DEAR HOOKER—The only science to which X. has contributed, so far as I know, is the science of self-advertisement; and of that he is a master.

When you and I were youngsters, we thought it the great thing to exorcise the aristocratic flunkeyism which reigned in the R.S.—the danger now is that of the entry of seven devils worse than the first, in the shape of rich engineers, chemical traders, and "experts" (who have sold their souls for a good price), and who find it helps them to appear to the public as if they were men of science.

If the Phil. Club had kept pure, it might have acted as a check upon the intrusion of the mere trading element. But there seems to be no reason now against Jack and Tom and Harry getting in, and the thing has become an imposture.

So I go with you for extinction, before we begin to drag in the mud.

I wish I could take some more active part in what is going on. I am anxious about the Society altogether. But though I am wonderfully well so long as I live like a hermit, and get out



into the air of the Downs, either London, or both, and still more both combined, intimate respectfully but firmly, that my margin is of the narrowest.—Ever yours,

T. H. HUXLEY.

The following is to his daughter in Paris. Of course it was the Tuileries, not the Louvre, which was destroyed in 1871:—

I think you are quite right about French women. They are like French dishes, uncommonly well cooked and sent up, but what the dickens they are made of is a mystery. Not but what all womankind are mysteries, but there are mysteries of godliness and mysteries of iniquity.

Have you been to see the sculptures in the Louvre?—dear me, I forgot the Louvre's fate. I wonder where the sculpture is? I used to think it the best thing in the way of art in Paris. There was a youthful Bacchus who was the main support of my thesis as to the greater beauty of the male figure!

Probably I had better conclude.

TO MR. E. T. COLLINGS (OF BOLTON)

4 MARLBOROUGH PLACE, *April* 9, 1889.

DEAR SIR—I understand that you ask me what I think about “alcohol as a stimulant to the brain in mental work”?

Speaking for myself (and perhaps I may add for persons of my temperament), I can say, without hesitation, that I would just as soon take a dose of arsenic as I would of alcohol, under such circumstances. Indeed on the whole, I should think the arsenic safer, less likely to lead to physical and moral degradation. It would be better to die outright than to be alcoholised before death.

If a man cannot do brain work without stimulants of any kind, he had better turn to hand work—it is an indication on Nature's part that she did not mean him to be a head worker.

The circumstances of my life have led me to experience all sorts of conditions in regard to alcohol, from total abstinence to nearly the other end of the scale, and my clear conviction is the less the better, though I by no means feel called upon to forego the comforting and cheering effect of a little.

But for no conceivable consideration would I use it to whip up a tired or sluggish brain. Indeed, for me there is no working

time so good as between breakfast and lunch, when there is not a trace of alcohol in my composition.

4 MARLBOROUGH PLACE, *May 6, 1889.*

MY DEAR HOOKER—I meant to have turned up at the *x* on Thursday, but I was unwell and, moreover, worried and bothered about Collier's illness at Venice, and awaiting telegram I sent there. He has contrived to get scarlatina, but I hope he will get safe through it, as he seems to be going on well. We were getting ready to go out until we were reassured on that point.

I thought I would go to the Academy dinner on Saturday, and that if I did not eat and drink and came away early, I might venture.

It was pleasant enough to have a glimpse of the world, the flesh (on the walls, nude!), and the devil (there were several Bishops), but oh, dear! how done I was yesterday.

However, we are off to Eastbourne to-day, and I hope to wash three weeks' London out of me before long. I think we shall go to Maloja again early in June.—Ever yours,

T. H. HUXLEY.

Capital portrait in the New Gallery, when I looked in for a quarter of an hour on Saturday—only you never were quite so fat in the cheeks, and I don't believe you have got such a splendid fur-coat!

3 JEVINGTON GARDENS, EASTBOURNE,  
*May 22, 1889.*

. . . As to the Assistant Secretaryship of the British Association, I have turned it over a great deal in my mind since your letter reached me, and I really cannot convince myself that you would suit it or it would suit you. I have not heard who are candidates or anything about it, and I am not going to take any part in the election. But looking at the thing solely from the point of view of your interests, I should strongly advise you against taking it, even if it were offered.

My pet aphorism "suffer fools gladly" should be the guide of the Assistant Secretary, who, during the fortnight of his activity, has more little vanities and rivalries to smooth over and conciliate than other people meet with in a lifetime. Now you do *not* "suffer fools gladly"; on the contrary, you "gladly make fools suffer." I do not say you are wrong—No *tu quoque*—but that is where the danger of the explosion lies—not in regard to the larger business of the Association.

The risk is great and the £300 a year is not worth it. Foster knows all about the place; ask him if I am not right.

Many thanks for the suggestion about *Spirula*. But the matter is in a state in which no one can be of any use but myself. At present I am at the end of my tether and I mean to be off to the Engadine a fortnight hence—most likely not to return before October.

Not even the sweet voice of —— will lure me from my retirement. The Academy dinner knocked me up for three days, though I drank no wine, ate very little, and vanished after the Prince of Wales' speech. The truth is I have very little margin of strength to go upon even now, though I am marvellously better than I was.

I am very glad that you see the importance of doing battle with the clericals. I am astounded at the narrowness of view of many of our colleagues on this point. They shut their eyes to the obstacles which clericalism raises in every direction against scientific ways of thinking, which are even more important than scientific discoveries.

I desire that the next generation may be less fettered by the gross and stupid superstitions of orthodoxy than mine has been. And I shall be well satisfied if I can succeed to however small an extent in bringing about that result.—I am, yours very faithfully,  
T. H. HUXLEY.

4 MARLBOROUGH PLACE, *May 25, 1889.*

MY DEAR LANKESTER—I cannot attend the Council meeting on the 29th. I have a meeting of the Trustees of the British Museum to-day, and to be examined by a Committee on Monday, and as the sudden heat half kills me I shall be fit for nothing but to slink off to Eastbourne again.

However, I do hope the Council will be very careful what they say or do about the immature fish question. The thing has been discussed over and over again *ad nauseam*, and I doubt if there is anything to be added to the evidence in the blue-books.

The *idée fixe* of the British public, fishermen, M.P.'s and ignorant persons generally is that all small fish, if you do not catch them, grow up into big fish. They cannot be got to understand that the wholesale destruction of the immature is the necessary part of the general order of things, from codfish to men.

You seem to have some very interesting things to talk about at the Royal Institution.

Do you see any chance of educating the white corpuscles of the human race to destroy the theological bacteria which are bred in parsons?—Ever yours very faithfully,

T. H. HUXLEY.

3 JEVINGTON GARDENS, EASTBOURNE,

*May 19, 1889.*

MY DEAR DONNELLY—The Vice-President's letter has brought home to me one thing very clearly, and that is, that I had no business to sign the Report. Of course he has a right to hold me responsible for a document to which my name is attached, and I should look more like a fool than I ever wish to do, if I had to tell him that I had taken the thing entirely on trust. I have always objected to the sleeping partnership in the Examination; and unless it can be made quite clear that I am nothing but a "consulting doctor," I really must get out of it entirely.

Of course I cannot say whether the Report is justified by the facts or not, when I do not know anything about them. But from my experience of what the state of things used to be, I should say that it is, in all probability, fair.

The faults mentioned are exactly those which always have made their appearance, and I expect always will do so, and I do not see why the attention of the teachers should not as constantly be directed to them. You talk of Eton. Well, the reports of the Examiners to the governing body, year after year, had the same unpleasing monotony, and I do not believe that there is any educational body, from the Universities downwards, which would come out much better, if the Examiners' reports were published and if they did their duty.

I am unable to see my way (and I suppose you are) to any better method of State encouragement of science teaching than payment by results. The great and manifest evil of that system, however, is the steady pressure which it exerts in the development of every description of sham teaching. And the only check upon this kind of swindling the public seems to me to lie in the hands of the Examiners. I told Mr. Forster so, ages ago, when he talked to me about the gradual increase of the expenditure, and I have been confirmed in my opinion by all subsequent experience. What the people who read the reports may say, I should not care one 2d. d—if I had to administer the thing.

Nine out of ten of them are incompetent to form any opinion on an educational subject; and as a mere matter of policy, I

should, in dealing with them, be only too glad to be able to make it clear that some of the defects and shortcomings inherent in this (as in all systems) had been disguised, and that even the most fractious of Examiners had said their say without let or hindrance.

It is the nature of the system which seems to me to demand as a corrective incessant and severe watchfulness on the part of the Examiners, and I see no harm if they a little overdo the thing in this direction, for every sham they let through is an encouragement to other shams and pot-teaching in general.

And if the "great heart" of the people and its thick head can't be got to appreciate honesty, why the sooner we shut up the better. Ireland may be for the Irish, but science teaching is not for the sake of science teachers.—Ever yours,

T. H. HUXLEY.

## CHAPTER XV

1889

FROM the middle of June to the middle of September, Huxley was in Switzerland, first at Monte Generoso, then, when the weather became more settled, at the Maloja. Here, as his letters show, he "rejuvenated" to such an extent that Sir Henry Thompson, who was at the Maloja, scoffed at the idea of his ever having had dilated heart.

MONTE GENEROSO, TESSIN, SUISSE, *June 25, 1889.*

MY DEAR HOOKER—I am quite agreed with the proposed arrangements for the  $x$ , and hope I shall show better in the register of attendance next session.

When I am striding about the hills here I really feel as if my invalidism were a mere piece of malingering. When I am well I can walk up hill and down dale as well as I did twenty years ago. But my margin is abominably narrow, and I am at the mercy of "liver and lights." Sitting up for long and dining are questions of margin.

I do not know if you have been here. We are close on 4000 feet up and look straight over the great plain of N. Italy on the one side and to a great hemicycle of mountains, Monte Rosa among them, on the other. I do not know anything more beautiful in its way. But the whole time we have been here the weather has been extraordinary. On the average, about two thunderstorms *per diem*. I am sure that a good meteorologist might study the place with advantage. The barometer has not varied three-twentieths of an inch the whole time, notwithstanding the storms.

I hear the weather has been bad all over Switzerland, but it is not high and dry enough for me here, and we shall be off to the Maloja on Saturday next, and shall stay there till we return somewhere in September. Collier and Ethel will join us there in August. He is none the worse for his scarlatina.

“Aged Botanist!” marry come up!\* I should like to know of a younger spark. The first time I heard myself called “the old gentleman” was years ago when we were in South Devon. A half-drunken Devonian had made himself very offensive, in the compartment in which my wife and I were travelling, and got some “simple Saxon” from me, accompanied, I doubt not, by an awful scowl. “Ain’t the old gentleman in a rage,” says he.

I am very glad to hear of Reggie’s success, and my wife joins with me in congratulations. It is a comfort to see one’s shoots planted out and taking root, though the idea that one’s cares and anxieties about them are diminished, we find to be an illusion.

I inclose cheque for my contributions due and to come.† If I go to Davy’s Locker before October, the latter may go for consolation champagne!—Ever yours affectionately,

T. H. HUXLEY.

He writes from the Maloja on August 16 to Sir M. Foster, who had been sitting on the Vaccination Commission:—

I wonder how you are prospering, whether you have vaccination or anti-vaccination on the brain; or whether the gods have prospered you so far as to send you on a holiday. We have been here since the beginning of July. Monte Generoso proved lovely—but electrical. We had on the average three thunderstorms every two days. Bellagio was as hot as the tropics, and we stayed only a day, and came on here—where, whatever else may happen, it is never too hot. The weather has been good and I have profited immensely, and at present I do not know whether I have a heart or not. But I have to look very sharp after my liver. H. Thompson, who has been here with his son Herbert (clever fellow, by the way), treats the notion that I ever had a dilated heart with scorn! Oh these doctors! they are worse than theologians.

And again on August 31:—

I walked eighteen miles three or four days ago, and I think nothing of one or two thousand feet up! I hope this state of things will last at the sea-level.

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\* Sir J. Hooker jestingly congratulated him on taking up botany in his old age.

† For the *x* Club.

I am always glad to hear of and from you, but I have not been idle long enough to forget what being busy means, so don't let your conscience worry you about answering my letters.

. . . X. is, I am afraid, more or less of an ass. The opposition he and his friends have been making to the Technical Bill is quite unintelligible to me. Y. may be, and I rather think is, a knave, but he is no fool; and if I mistake not he is minded to kick the ultra-radical stool down now that he has mounted by it. Make friends of that Mammon of unrighteousness and swamp the sentimentalists.

. . . I despise your insinuations. All my friends here have been theological—Bishop, Chief Rabbi, and Catholic Professor. None of your Maybrick discussors.

On June 25 he wrote to Professor Ray Lankester, enclosing a letter to be read at a meeting called by the Lord Mayor, on July 1, to hear statements from men of science with regard to the recent increase of rabies in this country, and the efficiency of the treatment discovered by M. Pasteur for the prevention of hydrophobia.

I quote the latter from the report in *Nature* for July 4:—

MONTE GENEROSO, TESSIN, SUISSE, *June 25, 1889.*

MY DEAR LANKESTER—I inclose herewith a letter for the Lord Mayor and a cheque for £5 as my subscription. I wish I could make the letter shorter, but it is pretty much “pemmican” already. However, it does not much matter being read if it only gets into print.

It is uncommonly good of the Lord Mayor to stand up for Science, in the teeth of the row the anti-vivisection pack—dogs and doggeses—are making.

May his shadow never be less.

We shall be off to the Maloja at the end of this week, if the weather mends. Thunderstorms here every day, and sometimes two or three a day for the last ten days.—Ever yours very faithfully,

T. H. HUXLEY.

MONTE GENEROSO, SWITZERLAND, *June 25, 1889.*

MY LORD MAYOR—I greatly regret my inability to be present at the meeting which is to be held, under your Lordship's auspices, in reference to M. Pasteur and his Institute. The unremitting labours of that eminent Frenchman during the last half-century have yielded rich harvests of new truths, and are



models of exact and refined research. As such they deserve, and have received, all the honours which those who are the best judges of their purely scientific merits are able to bestow. But it so happens that these subtle and patient searchings out of the ways of the infinitely little—of the swarming life where the creature that measures one-thousandth part of an inch is a giant—have also yielded results of supreme practical importance. The path of M. Pasteur's investigations is strewn with gifts of vast monetary value to the silk trades, the brewer, and the wine merchant. And this being so, it might well be a proper and graceful act on the part of the representatives of trade and commerce in its greatest centre to make some public recognition of M. Pasteur's services, even if there were nothing further to be said about them. But there is much more to be said. M. Pasteur's direct and indirect contributions to our knowledge of the causes of diseased states, and of the means of preventing their recurrence, are not measurable by money values, but by those of healthy life and diminished suffering to men. Medicine, surgery, and hygiene have all been powerfully affected by M. Pasteur's work, which has culminated in his method of treating hydrophobia. I cannot conceive that any competently instructed person can consider M. Pasteur's labours in this direction without arriving at the conclusion that, if any man has earned the praise and honour of his fellows, he has. I find it no less difficult to imagine that our wealthy country should be other than ashamed to continue to allow its citizens to profit by the treatment freely given at the Institute without contributing to its support. Opposition to the proposals which your Lordship sanctions would be equally inconceivable if it arose out of nothing but the facts of the case thus presented. But the opposition which, as I see from the English papers, is threatened has really for the most part nothing to do either with M. Pasteur's merits or with the efficacy of his method of treating hydrophobia. It proceeds partly from the fanatics of *laissez faire*, who think it better to rot and die than to be kept whole and lively by State interference, partly from the blind opponents of properly conducted physiological experimentation, who prefer that men should suffer than rabbits or dogs, and partly from those who for other but not less powerful motives hate everything which contributes to prove the value of strictly scientific methods of enquiry in all those questions which affect the welfare of society. I sincerely trust that the good sense of the meeting over which your Lordship will preside will preserve it

from being influenced by those unworthy antagonisms, and that the just and benevolent enterprise you have undertaken may have a happy issue.—I am, my Lord Mayor, your obedient servant,

THOMAS H. HUXLEY.

HOTEL KURSAAL, MALOJA, HAUTE ENGADINE,  
July 8, 1889.

MY DEAR LANKESTER—Many thanks for your letter. I was rather anxious as to the result of the meeting, knowing the malice and subtlety of the Philistines, but as it turned out they were effectually snubbed. I was glad to see your allusion to Coleridge's impertinences. It will teach him to think twice before he abuses his position again. I do not understand Stead's position in the *Pall Mall*. He snarls but does not bite.

I am glad that the audience (I judge from the *Times* report) seemed to make the points of my letter, and live in hope that when I see last week's *Spectator* I shall find Hutton frantic.

This morning a letter marked "Immediate" reached me from Bourne, date July 3. I am afraid he does not read the papers or he would have known it was of no use to appeal to me in an emergency. I am writing to him.—Ever yours very faithfully,

T. H. HUXLEY.

On his return to England, however, a fortnight of London, interrupted though it was by a brief visit to Mr. and Mrs. Humphry Ward at the delightful old house of Great Hampden, was as much as he could stand. "I begin to discover," he writes to Sir M. Foster, "I have a heart again, a circumstance of which I had no reminder at the Maloja." So he retreated at once to Eastbourne, which had done him so much good before.

4 MARLBOROUGH PLACE, Sept. 24, 1889.

MY DEAR HOOKER—How's a' wi' ye? We came back from the Engadine early in the month, and are off to Eastbourne to-morrow. I rejuvenate in Switzerland and senescate (if there is no such verb, there ought to be) in London, and the sooner I am out of it the better.

When are you going to have an  $x$ ? I cannot make out what has become of Spencer, except that he is somewhere in Scotland.—Ever yours,

T. H. HUXLEY.

We shall be at our old quarters—3 Jevington Gardens, Eastbourne—from to-morrow onwards.

The next letter shows once more the value he set upon botanical evidence in the question of the influence of conditions in the process of evolution.

3 JEVINGTON GARDENS, EASTBOURNE,

Sept. 29, 1889.

MY DEAR HOOKER—I hope to be with you at the Athenæum on Thursday. It does one good to hear of your being in such good working order. My knowledge of orchids is infinitesimally small, but there were some eight or nine species plentiful in the Engadine, and I learned enough to appreciate the difficulties. Why do not some of these people who talk about the direct influence of conditions try to explain the structure of orchids on that tack? Orchids at any rate can't try to improve themselves in taking shots at insects' heads with pollen bags—as Lamarck's Giraffes tried to stretch their necks!

Balfour's *ballon d'essai*\* (I do not believe it could have been anything more) is the only big blunder he has made, and it passes my comprehension why he should have made it. But he seems to have dropped it again like the proverbial hot potato. If he had not, he would have hopelessly destroyed the Unionist party.—Ever yours,

T. H. HUXLEY.

At the end of the year he thanks Lord Tennyson for his gift of "Demeter."

Dec. 26, 1889.

MY DEAR TENNYSON—Accept my best thanks for your very kind present of "Demeter." I have not had a Christmas Box I valued so much for many a long year. I envy your vigour, and am ashamed of myself beside you for being turned out to grass. I kick up my heels now and then, and have a gallop round the paddock, but it does not come to much.

With best wishes to you, and, if Lady Tennyson has not forgotten me altogether, to her also—Believe me, yours very faithfully,

T. H. HUXLEY.

A discussion in the *Times* this autumn, in which he joined, was of unexpected moment to him, inasmuch as it was the starting-point for no fewer than four essays in political philosophy, which appeared the following year in the *Nineteenth Century*.

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\* *i.e.* touching a proposed Roman Catholic University for Ireland.

The correspondence referred to arose out of the heckling of Mr. John Morley by one of his constituents at Newcastle in November 1889. The heckler questioned him concerning private property in land, quoting some early dicta from the "Social Statics" of Mr. Herbert Spencer, which denied the justice of such ownership. Comments and explanations ensued in the *Times*; Mr. Spencer declared that he had since partly altered that view, showing that contract has in part superseded force as the ground of ownership; and that in any case it referred to the idea of absolute ethics, and not to relative or practical politics.

Huxley entered first into the correspondence to point out present and perilous applications of the absolute in contemporary politics. Touching on a State guarantee of the title to land, he asks if there is any moral right for confiscation:—In Ireland, he says, confiscation is justified by the appeal to wrongs inflicted a century ago; in England the theorems of "absolute political ethics" are in danger of being employed to make this generation of land-owners responsible for the misdeeds of William the Conqueror and his followers. (*Times*, November 12.)

His remaining share in the discussion consisted of a brief passage of arms with Mr. Spencer on the main question,\* and a reply to another correspondent,† which brings forward an argument enlarged upon in one of the essays, viz. that if the land belongs to all men equally, why should one nation claim one portion rather than another? For several ownership is just as much an infringement of the world's ownership as is personal ownership. Moreover, history shows that land was originally held in several ownership, and that not of the nation, but of the village community.

These signs of renewed vigour induced Mr. Knowles to write him a "begging letter," proposing an article for the *Nineteenth Century* either in commendation of Bishop Magee's recent utterances—it would be fine for eulogy to come from such a quarter after the recent encounter—or

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\* November 18.

† November 21.

on the general subject of which his *Times* letters dealt with a part.

Huxley's choice was for the latter. Writing on November 21, he says:—

Now as to the article. I have only hesitated because I want to get out a new volume of essays, and I am writing an introduction which gives me an immensity of trouble. I had made up my mind to get it done by Christmas, and if I write for you it won't be. However, if you don't mind leaving it open till the end of this month, I will see what can be done in the way of a screed about, say, "The Absolute in Practical Life." The Bishop would come in excellently; he deserves all praises, and my only hesitation about singing them is that the conjunction between the "Infidel" and the Churchman is just what the blatant platform Dissenters who had been at him would like. I don't want to serve the Bishop, for whom I have a great liking and respect, as the bear served his sleeping master, when he smashed his nose in driving an unfortunate fly away!

By the way, has the Bishop published his speech or sermon? I have only seen a newspaper report.

Soon after this, he proposed to come to town and talk over the article with Mr. Knowles. The latter sent him a telegram—reply paid—asking him to fix a day. The answer named a day of the week and a day of the month which did not agree; whereupon Mr. Knowles wrote by the safer medium of the post for an explanation, thinking that the post-office clerks must have bungled the message, and received the following reply:—

3 JEVINGTON GARDENS, EASTBOURNE,  
Nov. 26, 1889.

MY DEAR KNOWLES—May jackasses sit upon the graves of all telegraph clerks! But the boys are worse, and I shall have to write to the P.-M.-General about the little wretch who brought your telegram the other day, when my mind was deeply absorbed in the concoction of an article for *the* Review of our age.

The creature read my answer, for he made me pay three half-pence extra (I believe he spent it on toffy), and yet was so stupid as not to see that meaning to fix next Monday or Tuesday, I opened my diary to give the dates in order that there should be no mistake, and found Monday 28 and Tuesday 29.

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The creature read my answer, for he made me pay three half-pence extra (I believe he spent it on toffy), and yet was so stupid as not to see that meaning to fix next Monday or Tuesday, I opened my diary to give the dates in order that there should be no mistake, and found Monday 28 and Tuesday 29.

And I suppose the little beast would say he did not know I opened it in October instead of November!

I hate such mean ways. Hang all telegraph boys!—Ever yours very faithfully,  
T. H. HUXLEY.

Monday, December 2, if you have nothing against it, and lunch if Mrs. Knowles will give me some.

The article was finished by the middle of December and duly sent to the editor, under the title of "Rousseau and Rousseauism." But fearing that this title would scarcely attract attention among the working men for whom it was specially designed, Mr. Knowles suggested instead the "Natural Inequality of Men," under which name it actually appeared in January. So, too, in the case of a companion article in March, the editorial pen was responsible for the change from the arid possibilities of "Capital and Labour" to the more attractive title of "Capital the Mother of Labour."

With regard to this article and a further project of extending his discussion of the subject, he writes:—

3 JEVINGTON GARDENS, EASTBOURNE,  
*Dec. 14, 1889.*

MY DEAR KNOWLES—I am very glad you think the article will go. It is longer than I intended, but I cannot accuse myself of having wasted words, and I have left out several things that might have been said, but which can come in by and by.

As to title, do as you like, but that you propose does not seem to me quite to hit the mark. "Political Humbug: Liberty and Equality," struck me as adequate, but my wife declares it is improper. "Political Fictions" might be supposed to refer to Dizzie's novels! How about "The Politics of the Imagination: Liberty and Inequality"?

I should like to have some general title that would do for the "letters" which I see I shall have to write. I think I will make six of them after the fashion of my "Working Men's Lectures," as thus: (1) Liberty and Equality; (2) Rights of Man; (3) Property; (4) Malthus; (5) Government, the province of the State; (6) Law-making and Law-breaking.

I understand you will let me republish them, as soon as the last is out, in a cheap form. I am not sure I will not put them in the form of "Lectures" rather than "Letters."



Did you ever read Henry George's book "Progress and Poverty"? It is more damner nonsense than poor Rousseau's blether. And to think of the popularity of the book! But I ought to be grateful, as I can cut and come again at this wonderful dish.

The mischief of it is I do not see how I am to finish the introduction to my Essays, unless I put off sending you a second dose until March.

I will send back the revise as quickly as possible.—Ever yours very truly,  
T. H. HUXLEY.

You do not tell me that there is anything to which Spencer can object, so I suppose there is nothing.

And in an undated letter to Sir J. Hooker, he says:—

I am glad you think well of the "Human Inequality" paper. My wife has persuaded me to follow it up with a view to making a sort of "Primer of Politics" for the masses—by and by. "There's no telling what you may come to, my boy," said the Bishop who reproved his son for staring at John Kemble, and I may be a pamphleteer yet! But really it is time that somebody should treat the people to common sense.

However, immediately after the appearance of this first article on Human Inequality, he changed his mind about the Letters to Working Men, and resolved to continue what he had to say in the form of essays in the *Nineteenth Century*.

He then judged it not unprofitable to call public attention to the fallacies which first found their way into practical politics through the disciples of Rousseau; one of those speculators of whom he remarks (i. 312) that "busied with deduction from their ideal 'ought to be,' they overlooked the 'what has been,' the 'what is,' and the 'what can be.'" "Many a long year ago," he says in *Natural Rights and Political Rights* (i. 336), "I fondly imagined that Hume and Kant and Hamilton having slain the 'Absolute,' the thing must, in decency, debase. Yet, at the present time, the same hypostatized negation, sometimes thinly disguised under a new name, goes about in broad daylight, in company with the dogmas of absolute ethics, political and other, and seems to be as lively as

ever." This was to his mind one of those instances of wrong thinking which lead to wrong acting—the postulating a general principle based upon insufficient data, and the deduction from it of many and far-reaching practical consequences. This he had always strongly opposed. His essay of 1871, "Administrative Nihilism," was directed against *a priori* individualism; and now he proceeded to restate the arguments against *a priori* political reasoning in general, which seemed to have been forgotten or overlooked, especially by the advocates of compulsory socialism. And here it is possible to show in some detail the care he took, as was his way, to refresh his knowledge and bring it up to date, before writing on any special point. It is interesting to see how thoroughly he went to work, even in a subject with which he was already fairly acquainted. As in the controversy of 1889 I find a list of near a score of books consulted, so here one note-book contains an analysis of the origin and early course of the French Revolution, especially in relation to the speculations of the theorists; the declaration of the rights of man in 1789 is followed by parallels from Mably's *Droits et Devoirs du Citoyen* and *De la Législation*, and by a full transcript of the 1793 Declaration, with notes on Robespierre's speech at the Convention a fortnight later. There are copious notes from Dunoyer, who is quoted in the article, while the references to Rocquain's *Esprit Révolutionnaire* led to an English translation of the work being undertaken, to which he contributed a short preface in 1891.

It was the same with other studies. He loved to visualise his object clearly. The framework of what he wished to say would always be drawn out first. In any historical matter he always worked with a map. In natural history he well knew the importance of studying distribution and its bearing upon other problems; in civil history he would draw maps to illustrate either the conditions of a period or the spread of a civilising nation. For instance, among sketches of the sort which remain, I have one of the Hellenic world, marked off in 25-mile circles from Delos as centre; and a similar one for the Phœnician world, starting

from Tyre. Sketch maps of Palestine and Mesopotamia, with notes from the best authorities on the geography of the two countries, belong in all probability to the articles on "The Flood" and "Hasisadra's Adventure." To realise clearly the size, position, and relation of the parts to the whole, was the mechanical instinct of the engineer which was so strong in him.

The four articles which followed in quick succession on "The Natural Inequality of Man," "Natural and Political Rights," "Capital the Mother of Labour," and "Government," appeared in the January, February, March, and May numbers of the *Nineteenth Century*, and, as was said above, are directed against *a priori* reasoning in social philosophy. The first, which appeared simultaneously with Mr. Herbert Spencer's article on "Justice" in the *Nineteenth Century*, assails, on the ground of fact and history, the dictum that men are born free and equal, and have a natural right to freedom and equality, so that property and political rights are a matter of contract. History denies that they thus originated; and, in fact, "proclaim human equality as loudly as you like, Witless will serve his brother." Yet, in justice to Rousseau and the influence he wielded, he adds:—

It is not to be forgotten that what we call rational grounds for our beliefs are often extremely irrational attempts to justify our instincts.

Thus if, in their plain and obvious sense, the doctrines which Rousseau advanced are so easily upset, it is probable that he had in his mind something which is different from that sense.

When they sought speculative grounds to justify the empirical truth

that it is desirable, in the interests of society, that all men should be as free as possible, consistently with those interests, and that they should all be equally bound by the ethical and legal obligations which are essential to social existence, "the philosophers," as is the fashion of speculators, scorned to remain on the safe if humble ground of experience, and preferred to prophesy from the sublime cloudland of the *a priori*.

The second of these articles is an examination of Henry George's doctrines as set forth in *Progress and Poverty*. His relation to the physiocrats is shown in a preliminary analysis of the term "natural rights which have no wrongs," and are antecedent to morality, from which analysis are drawn the results of confounding natural with moral rights.

Here again is the note of justice to an argument in an unsound shape (p. 369): "There is no greater mistake than the hasty conclusion that opinions are worthless because they are badly argued." And a trifling abatement of the universal and exclusive form of Henry George's principle may make it true, while even unamended it may lead to opposite conclusions—to the justification of several ownership in land as well as in any other form of property.

The third essay of the series, "Capital the Mother of Labour" (*Coll. Ess.* ix. 147), was an application of biological methods to social problems, designed to show that the extreme claims of labour as against capital are ill-founded.

In the last article, "Government," he traces the two extreme developments of absolute ethics, as shown in anarchy and regimentation, or unrestrained individualism and compulsory socialism. The key to the position, of course, lies in the examination of the premises upon which these superstructures are raised, and history shows that—

So far from the preservation of liberty and property and the securing of equal rights being the chief and most conspicuous object aimed at by the archaic politics of which we know anything, it would be a good deal nearer the truth to say that they were federated absolute monarchies, the chief purpose of which was the maintenance of an established church for the worship of the family ancestors.

These articles stirred up critics of every sort and kind; socialists who denounced him as an individualist, land nationalisers who had not realised the difference between communal and national ownership, or men who denounced him as an arm-chair cynic, careless of the poor and ignorant of the meaning of labour. Mr. Spencer considered the chief attack to be directed against his position; the regimental socialists as against theirs, and

as an attempt to justify those who, content with the present, are opposed to all endeavours to bring about any fundamental change in our social arrangements (*ib.* p. 423).

So far from this, he continues:—

Those who have had the patience to follow me to the end will, I trust, have become aware that my aim has been altogether different. Even the best of modern civilisations appears to me to exhibit a condition of mankind which neither embodies any worthy ideal nor even possesses the merit of stability. I do not hesitate to express my opinion that, if there is no hope of a large improvement of the condition of the greater part of the human family; if it is true that the increase of knowledge, the winning of a greater dominion over Nature which is its consequence, and the wealth which follows upon that dominion, are to make no difference in the extent and the intensity of Want, with its concomitant physical and moral degradation, among the masses of the people, I should hail the advent of some kindly comet, which would sweep the whole affair away, as a desirable consummation. What profits it to the human Prometheus that he has stolen the fire of heaven to be his servant, and that the spirits of the earth and of the air obey him, if the vulture of pauperism is eternally to tear his very vitals and keep him on the brink of destruction?

Assuredly, if I believed that any of the schemes hitherto proposed for bringing about social amelioration were likely to attain their end, I should think what remains to me of life well spent in furthering it. But my interest in these questions did not begin the day before yesterday; and, whether right or wrong, it is no hasty conclusion of mine that we have small chance of doing rightly in this matter (or indeed in any other) unless we think rightly. Further, that we shall never think rightly in politics until we have cleared our minds of delusions, and more especially of the philosophical delusions which, as I have endeavoured to show, have infested political thought for centuries. My main purpose has been to contribute my mite towards this essential preliminary operation. Ground must be cleared and levelled before a building can be properly commenced; the labour of the navy is as necessary as that of the architect, however much less honoured; and it has been my humble endeavour to grub up those old stumps of the *a priori* which stand in the way of the very foundations of a sane political philosophy. To those who think that questions of the kind

I have been discussing have merely an academic interest, let me suggest once more that a century ago Robespierre and St. Just proved that the way of answering them may have extremely practical consequences.

Without pretending to offer any off-hand solution for so vast a problem, he suggests two points in conclusion. One, that in considering the matter we should proceed from the known to the unknown, and take warning from the results of either extreme in self-government or the government of a family; the other, that the central point is "the fact that the natural order of things—the order, that is to say, as unmodified by human effort—does not tend to bring about what we understand as welfare." The population question has first to be faced.

The following letters cover the period up to the trip to the Canaries, already alluded to:—

3 JEVINGTON GARDENS, EASTBOURNE,

*Jan. 6, 1890.*

MY DEAR FOSTER—That capital photograph reached me just as we were going up to town (invited for the holidays by our parents), and I put it in my bag to remind me to write to you. Need I say that I brought it back again without having had the grace to send a line of thanks? By way of making my peace, I have told the Fine Art Society to send you a copy of the engraving of my sweet self. I have not had it framed—firstly, because it is a hideous nuisance to be obliged to hang a frame one may not like; and secondly, because by possibility you might like some other portrait better, in which case, if you will tell me, I will send that other. I should like you to have something by way of reminder of T. H. H.

When Harry \* has done his work at Bart's at the end of March I am going to give him a run before he settles down to practice. Probably we shall go to the Canaries. I hear that the man who knows most about them is Dr. Guillemard, a Cambridge man. "Kennst du ihn wohl?" Perhaps he might give me a wrinkle.

With our united best wishes to you all—Ever yours very faithfully,

T. H. HUXLEY.

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\* His younger son.

EASTBOURNE, *Jan. 13, 1890.*

MY DEAR HOOKER— . . . We missed you on the 2nd, though you were quite right not to come in that beastly weather.

My boy Harry has had a very sharp attack of influenza at Bartholomew's, and came down to us to convalesce a week ago, very much pulled down. I hope you will keep clear of it.

H.'s work at the hospital is over at the end of March, and before the influenza business I was going to give him a run for a month or six weeks before he settled down to practice. We shall go to the Canaries as soon in April as possible. Are you minded to take a look at Teneriffe? Only  $4\frac{1}{2}$  days' sea—good ships.—Ever yours affectionately,  
T. H. HUXLEY.

However, Sir J. Hooker was unable to join "the excursion to the Isles of the Blest."

EASTBOURNE, *Jan. 27, 1890.*

MY DEAR FOSTER—People have been at me to publish my notice of Darwin in *P.R.S.* in a separate form.

If you have no objection, will you apply to the Council for me for the requisite permission?

But if you *do* see any objection, I would rather not make the request.

I think if I republish it I will add the *Times* article of 1859 to it. Omega and Alpha!

Hope you are flourishing. We shall be up for a few days next week.—Ever yours very faithfully,

T. H. HUXLEY.

EASTBOURNE, *Jan. 31, 1890.*

MY DEAR FOSTER—Mind you let me know what points you think want expanding in the Darwin obituary when we meet.

We go to town on Tuesday for a few days, and I will meet you anywhere or anywhen you like. Could you come and dine with us at 4 P.M. on Thursday? If so, please let me know at once, that E. may kill the fatted calf.

Harry has been and gone and done it. We heard he had gone to Yorkshire, and were anxious, thinking that at the very least a relapse after his influenza (which he had sharply) had occurred.

But the complaint was one with more serious *sequelæ* still. Don't know the young lady, but the youth has a wise head on his shoulders, and though that did not prevent Solomon from overdoing the business, I have every faith in his choice.

Dr. Guillemard has kindly sent me a lot of valuable information; but as I suggested to my boy yesterday, he may find Yorkshire air more wholesome than that of the Canaries, and it is ten to one we don't go after all.—Ever yours,  
T. H. H.

### TO HIS YOUNGER SON

EASTBOURNE, *Jan. 30, 1890.*

YOU DEAR OLD HUMBUG OF A BOY—Here we have been mourning over the relapse of influenza, which alone, as we said, could have torn you from your duties, and all the while it was nothing but an attack of palpitation such as young people are liable to and seem none the worse for after all. We are as happy that you are happy as you can be yourself, though from your letter that seems saying a great deal. I am prepared to be the young lady's slave; pray tell her that I am a model father-in-law, with my love. (By the way, you might mention her name; it is a miserable detail, I know, but would be interesting.) Please add that she is humbly solicited to grant leave of absence for the Teneriffe trip, unless she thinks Northallerton air more invigorating.—Ever your loving dad,  
T. H. HUXLEY.

On April 3, accompanied by his son, he left London on board the *Aorangi*. At Plymouth he had time to meet his friend W. F. Collier, and to visit the Zoological Station, while, "to my great satisfaction," he writes, "I received a revise (*i.e.* of 'Capital the Mother of Labour') for the *May Nineteenth Century*—from Knowles. They must have looked sharp at the printing-office."

It did not take him long to recover his sea-legs, and he thoroughly enjoyed even the rougher days when the rolling of the ship was too much for other people. The day before reaching Teneriffe he writes:—

I have not felt so well for a long time. I do nothing, have a prodigious appetite, and Harry declares I am getting fat in the face.

Santa Cruz was reached early on April 10, and in the afternoon he proceeded to Laguna, which he made his headquarters for a week. That day he walked 10 miles, the next 15, and the third 20 in the course of the day. He notes finding the characteristic *Euphorbia* and Heaths



of the Canaries; notes, too, one or two visitations of dyspepsia from indigestible food. He writes from Laguna:—

From all that people with whom we meet tell me, I gather that the usual massive lies about health resorts pervade the accounts of Teneriffe. Santa Cruz would reduce me to jelly in a week, and I hear that Orotava is worse—stifling. Guimar, whither we go to-morrow, is warranted to be dry and everlasting sunshine. We shall see. One of the people staying in the house said they had rain there for a fortnight together. . . . I am all right now, and walked some 15 miles up hill and down dale to-day, and I am not more than comfortably tired. However, I am not going to try the peak. I find it cannot be done without a night out at a considerable height when the thermometer commonly goes down below freezing, and I am not going to run that risk for the chance of seeing even the famous shadows.

By some mischance, no letters from home reached him till the 26th, and he writes from Guimar on the 23rd:—

A lady who lives here told me yesterday that a post-mistress at one place was in the habit of taking off the stamps and turning the letters on one side! But that luckily is not a particular dodge with ours.

We drove over here on the 17th. It is a very picturesque place 1000 feet up in the midst of a great amphitheatre of high hills, facing north, orange-trees laden with fruit, date palms and bananas are in the garden, and there is lovely sunshine all day long. Altogether the climate is far the best I have found anywhere here, and the house, which is that of a Spanish Marquesa, only opened as a hotel this winter, is very comfortable. I am sitting with the window wide open at nine o'clock at night, and the stars flash as if the sky were Australian.

On Saturday we had a splendid excursion up to the top of the pass that leads from here up to the other side of the island. Road in the proper sense there was none, and the track incredibly bad, worse than any Alpine path owing to the loose irregular stones. The mules, however, pick their way like cats, and you have only to hold on. The pass is 6000 feet high, and we ascended still higher. Fortune favoured us. It was a lovely day and the clouds lay in a great sheet a thousand feet below. The peak, clear in the blue sky, rose up bare and majestic 5000 feet out of as desolate a desert clothed with the stiff retama

shrubs (a sort of broom) as you can well imagine. It took us three hours and a half to get up, passing for a good deal of the time through a kind of low brush of white and red cistuses in full bloom. We saw Palma on one side, and Grand Canary on the other, beyond the layer of clouds which enveloped all the lower part of the island. Coming down was worse than going up, and we walked a good part of the way, getting back about six. About seven hours in the saddle and walking.

You never saw anything like the improvement in Harry. He is burnt deep red; he says my nose is of the same hue, and at the end of the journey he raced Gurilio, our guide, who understands no word of English any more than we do Spanish, but we are quite intimate nevertheless.\*

He reiterates his distress at not getting letters from his wife: "Certainly I will never run the risk of being so long without—never again." When, after all, the delayed letters reached him on his way back from the expedition to the Cañadas, thanks to a traveller who brought them up from Laguna, he writes (April 24):—

Catch me going out of reach of letters again. I have been horribly anxious. Nobody—children or any one else—can be to me what you are. Ulysses preferred his old woman to immortality, and this absence has led me to see that he was as wise in that as in other things. . . .

Here is a novel description of an hotel at Puerto Orotava:—

It is very pretty to look at, but all draughts. I compare it to the air of a big wash-house with all the doors open, and it was agreed that the likeness was exact.

I have no account of the visit to the Cañadas, "the one thing worth seeing there." But on May 2 he sailed for Madeira by the *German*, feeling already "ten years younger" for his holiday. On the 3rd he writes:—

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\* My brother indeed averred that his language of signs was far more effectual than the Spanish, which my father persisted in trying upon the inhabitants. This guide, by the way, was very sceptical as to any Englishman being equal to walking the seventeen miles, much less beating him in a race over the stony track. His experience was entirely limited to invalids.









The last time I was in this place was in 1846. All my life lies between the two visits. I was then twenty-one and a half, and I shall be sixty-five to-morrow. The place looks to me to have grown a good deal, but I believe it is chiefly English residents whose villas dot the hill. There were no woods forty-four years ago. Now there is one, I am told, to Camera do Lobos nearly five miles long. That is the measure of Portuguese progress in half a century. Moreover, the men have left off wearing their pigtail caps and the women their hoods.

### TO HIS YOUNGEST DAUGHTER

BELLA VISTA HOTEL, FUNCHAL, *May 6, 1890.*

DEAREST BABS—This comes wishing you many happy returns of the day, though a little late in the arrival. Harry sends his love, and desires me to say that he took care to write a letter which should arrive in time, but unfortunately forgot to mention the birthday in it! So I think, on the whole, I have the pull of him. We ought to be back about the 18th or 19th, as I have put my name down for places in the *Conway Castle*, which is to call here on the 12th, and I do not suppose she will be full. In the meanwhile, we shall fill up the time by a trip to the other side of the island, on which we start to-morrow morning at 7.30. You have to take your own provisions and rugs to sleep upon and under, as the fleas *là bas* are said to be unusually fine and active. We start quite a procession with a couple of horses, a guide, and two men (owners of the nags) to carry the baggage; and I suspect that before to-morrow night we shall have made acquaintance with some remarkably bad apologies for roads. But the horses here seem to prefer going up bad staircases at speed (with a man hanging on by the tail to steer), and if you only stick to them they land you all right. I have developed so much prowess in this line that I think of coming out in the character of Buffalo Bill on my return. Hands and face of both of us are done to a good burnt sienna, and a few hours more or less in the saddle don't count. I do not think either of us have been so well for years.

You will have heard of our doings in Teneriffe from M—. The Cañadas there is the one thing worth seeing, altogether unique. As a health resort I should say the place is a fraud—always excepting Guimar—and that, excellent for people in good health, is wholly unfit for a real invalid, who must either go uphill or downhill over the worst of roads if he leaves the hotel.

The air here is like that of South Devon at its best—very soft, but not stifling as at Orotava. We had a capital expedition yesterday to the Grand Corral—the ancient volcanic crater in the middle of the island with walls some 3000 feet high all scarred and furrowed by ravines, and overgrown with rich vegetation. There is a little village at the bottom of it which I should esteem as a retreat if I wished to be out of sight and hearing of the pomps and vanities of this world. By the way, I have been pretty well out of hearing of everything as it is, for I only had three letters from M—— while we were in Teneriffe, and not one here up to this date. After I had made all my arrangements to start to-morrow I heard that a mail would be in at noon. So the letters will have to follow us in the afternoon by one of the men, who will wait for them.

We went to-day to lunch with Mr. Blandy, the head of the principal shipping agency here, whose wife is the daughter of my successor at the Fishery Office. — has called upon me. What an effusive bore he is! But I believe he was very kind to poor Clifford, and restrained my unregenerate impatience of that kind of creature.

Well, our trip has done us both a world of good; but I am getting homesick, and shall rejoice to be back again. I hope that Joyce is flourishing, and Jack satisfied with the hanging of his pictures, and that a millionaire has insisted on buying the picture and adding a bonus. Our best love to you all.—Ever your loving  
PATER.

Don't know M——'s whereabouts. But if she is with you, say I wrote her a long screed (No. 8) and posted it to-day—with my love as a model husband and complete letter-writer.

On returning home he found that the Linnean medal had been awarded him.

4 MARLBOROUGH PLACE, *May 18, 1890.*

MY DEAR HOOKER—How's a' wi' you? My boy and I came back from Madeira yesterday in great feather. As for myself, riding about on mules, or horses, for six to ten hours at a stretch—burning in sun or soaking in rain—over the most entirely breakneck roads and tracts I have ever made acquaintance with, except perhaps in Morocco—has proved a most excellent tonic, cathartic, and alterative all in one. Existence of heart and stomach are matters of faith, not of knowledge, with me at present. I hope it may last, and I have had such a sickener



of invalidism that my intention is, to keep severely out of all imprudences.

But what is a man to do if his friends take advantage of his absence, and go giving him gold medals behind his back? That you have been an accomplice in this nefarious plot—mine own familiar friend whom I trusted and trust—is not to be denied. Well, it is very pleasant to have toil that is now all ancient history remembered, and I shall go to the meeting and the dinner and make my speech in spite of as many possible devils of dyspepsia as there are plates and dishes on the table.

We were lucky in getting in for nothing worse than heavy rolling, either out or in. Teneriffe is well worth seeing. The Cañadas is something quite by itself, a bit of Egypt 6000 feet up with a bare volcanic cone, or rather long barrow sticking up 6000 feet in the middle of it.

Otherwise, Madeira is vastly superior. I rode across from Funchal to Sao Vicente, up to Paul da Serra, then along the coast to Santa Anna, and back from Sta. Anna to Funchal. I have seen nothing comparable except in Mauritius, nor anything anywhere like the road by the cliffs from Sao Vicente to Sta. Anna. Lucky for me that my ancient nautical habit of sticking on to a horse came back. A good deal of the road is like a bad staircase, with no particular banisters, and a well of 1000 feet with the sea at the bottom. Your heart would rejoice over the great heaths. I saw one, the bole of which split into nearly equal trunks; and one of these was just a metre in circumference, and had a head as big as a moderate-sized ash. Gorse in full flower, up to 12 or 15 feet high. On the whole a singular absence of flowering herbs except *Cinerarias* and, especially in Teneriffe, *Echium*. I did not chance to see a *Euphorbia* in Madeira, though I believe there are some. In Teneriffe they are everywhere in queer shapes, and there was a thing that mimicked the commonest *Euphorbia* but had no milk, which I will ask you about when I see you. The *Euphorbias* were all in flower, but this thing had none. But you will have had enough of my scrawl.—Ever yours affectionately,

T. H. HUXLEY.

## CHAPTER XVI

1890-91

THREE letters of the first half of the year may conveniently be placed here. The first is to Tyndall, who had just been delivering an anti-Gladstonian speech at Belfast. The opening reference must be to some newspaper paragraph which I have not been able to trace, just as the second is to a paragraph in 1876, not long after Tyndall's marriage, which described Huxley as starting for America with his titled bride.

3 JEVINGTON GARDENS, EASTBOURNE,  
*Feb. 24, 1890.*

MY DEAR TYNDALL—Put down the three half-pints and the two dozen to the partnership account. Ever since the "titled bride" business I have given up the struggle against the popular belief that you and I constitute a firm.

It's very hard on me in the decline of life to have a lively young partner who thinks nothing of rushing six or seven hundred miles to perform a war-dance on the sainted G.O.M., and takes the scalp of Historicus as a *hors d'œuvre*.

All of which doubtless goes down to my account just as my poor innocent articles confer a reputation for long-suffering mildness on you.

Well! well! there is no justice in this world! With our best love to you both—Ever yours,  
T. H. HUXLEY.

(The confusion in the popular mind continued steadily, so that at last, when Tyndall died, Huxley received the doubtful honour of a funeral sermon.)

Dr. Pelseneer, to whom the next letter is addressed, is a Belgian morphologist, and an authority upon the Mollusca. He it was who afterwards completed Huxley's unfinished memoir on *Spirula* for the *Challenger* report.

4 MARLBOROUGH PLACE, *June 10, 1890.*

DEAR DR. PELSENEER—I gave directions yesterday for the packing up and sending to your address of the specimens of *Trigonia*, and I trust that they will reach you safely.

I am rejoiced that you are about to take up the subject. I was but a beginner when I worked at *Trigonia*, and I had always promised myself that I would try to make good the many deficiencies of my little sketch. But three or four years ago my health gave way completely, and though I have recovered (no less to my own astonishment than to that of the doctors) I am compelled to live out of London and to abstain from all work which involves much labour.

Thus science has got so far ahead of me that I hesitate to say much about a difficult morphological question—all the more, as old men like myself should be on their guard against over-much tenderness for their own speculations. And I am conscious of a great tenderness for those contained in my ancient memoir on the "Morphology of the Cephalous Mollusca." Certainly I am entirely disposed to agree with you that the Gastropods and the Lamellibranchs spring from a common root—nearly represented by the Chiton—especially by a hypothetical *Chiton* with one shell plate.

I always thought *Nucula* the key to the Lamellibranchs, and I am very glad you have come to that conclusion on such much better evidence.—I am, dear Dr. Pelseener, yours very faithfully,  
T. H. HUXLEY.

Towards the end of June he went for a week to Salisbury, taking long walks in the neighbourhood, and exploring the town and cathedral, which he confessed himself ashamed never to have seen before.

He characteristically fixes its date in his memory by noting that the main part of it was completed when Dante was a year old.

THE WHITE HART, SALISBURY, *June 22, 1890.*

MY DEAR DONNELLY—Couldn't stand any more London, so bolted here yesterday morning, and here I shall probably stop for the next few days.

I have been trying any time the last thirty years to see Stonehenge, and this time I mean to do it. I should have gone to-day, but the weather was not promising, so I spent my Sunday morning in Old Sarum—that blessed old tumulus with nine (or was it eleven?) burgesses that used to send two members to

Parliament when I was a child. Really you Radicals are of some use after all!

Poor old Smyth's \* death is just what I expected, though I did not think the catastrophe was so imminent.

Peace be with him; he never did justice to his very considerable abilities, but he was a good fellow and a fine old crusted Conservative.

I suppose it will be necessary to declare the vacancy and put somebody in his place before long.

I learned before I started that Smyth was to be buried in Cornwall, so there is no question of attending at his funeral.

I am the last of the original Jermyn Street gang left in the school now—Ultimus Romanorum!—Ever yours very faithfully,  
T. H. HUXLEY.

This trip was taken by way of a holiday after the writing of an article, which appeared in the *Nineteenth Century* for July 1890. It was called "The Lights of the Church and the Light of Science," and may be considered as written in fulfilment of the plan spoken of in the letter to Mr. Clodd (p. 245). Its subject was the necessary dependence of Christian theology upon the historical accuracy of the Old Testament; its occasion, the publication of a sermon in which, as a counterblast to *Lux Mundi*, Canon Liddon declared that accuracy to be sanctioned by the use made of the Old Testament by Jesus Christ, and bade his hearers close their ears against any suggestions impairing the credit of those Jewish Scriptures which have received the stamp of his Divine authority.

Pointing out that, as in other branches of history, so here the historical accuracy of early tradition was abandoned even by conservative critics, who at all understood the nature of the problems involved, Huxley proceeded to examine the story of the Flood, and to show that the difficulties were little less in treating it—like the reconcilers—as a partial than as a universal deluge. Then he

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\* Warrington Wilkinson Smyth (1817-1890), the geologist and mineralogist. In 1851 he was appointed Lecturer on Mining and Mineralogy at the Royal School of Mines. After the lectureships were separated in 1881, he retained the former until his death. He was knighted in 1887.



effect this phenomenon had upon the theory of Induction. Huxley replied as follows:—

GRAND HOTEL, EASTBOURNE, *July 21, 1890.*

DEAR SIR—I knew Mr. Babbage, and am quite sure that he was not the man to say anything on the topic of calculating machines which he could not justify.

I do not see that what he says affects the philosophy of induction as rightly understood. No induction, however broad its basis, can confer certainty—in the strict sense of the word. The experience of the whole human race through innumerable years has shown that stones unsupported fall to the ground, but that does not make it certain that any day next week unsupported stones will not move the other way. All that it does justify is the very strong expectation, which hitherto has been invariably verified, that they will do just the contrary.

Only one absolute certainty is possible to man—namely, that at any given moment the feeling which he has exists.

All other so-called certainties are beliefs of greater or less intensity.

Do not suppose that I am following Abernethy's famous prescription, "take my pills," if I refer you to an essay of mine on "Descartes," and a little book on Hume, for the fuller discussion of these points. Hume's argument against miracles turns altogether on the fallacy that induction can give certainty in the strict sense.

We poor mortals have to be content with hope and belief in all matters past and present—our sole certainty is momentary.—I am yours faithfully,

T. H. HUXLEY.

Sir J. G. T. Sinclair, Bart.

Except for a last visit to London to pack his books, which proved a heavier undertaking than he had reckoned upon, Huxley did not leave Eastbourne this autumn, refusing Sir J. Donnelly's hospitable invitation to stay with him in Surrey during the move, of which he exclaims:—

Thank Heaven that is my last move—except to a still smaller residence of a subterranean character!

GRAND HOTEL, EASTBOURNE, *Sept. 19, 1890.*

MY DEAR DONNELLY—And my books—and watch-dog business generally?

How is that to be transacted whether as in-patient or out-patient at Firdale? Much hospitality hath made thee mad.

Seriously, it's not to be done nohow. What between papers that don't come, and profligate bracket manufacturers who keep you waiting for months and then send the wrong things—and a general tendency of everybody to do nothing right or something wrong—it is as much as the two of us will do—to get in, and all in the course of the next three weeks.

Of course my wife has no business to go to London to superintend the packing—but I should like to see anybody stop her. However, she has got the faithful Minnie to do the actual work; and swears by all her Gods and Goddesses she will only direct.

It will only make her unhappy if I did not make pretend to believe, and hope no harm may come of it.—*Tout à vous,*

T. H. HUXLEY.

Another discussion which sprang up in the *Times*, upon Medical Education, evoked a letter from him (*Times*, August 7), urging that the preliminary training ought to be much more thorough and exact. The student at his first coming is so completely habituated to learn only from books or oral teaching, that the attempt to learn from things and to get his knowledge at first hand is something new and strange. Thus a large proportion of medical students spend much of their first year in learning how to learn, and when they have done that, in acquiring the preliminary scientific knowledge, with which, under any rational system of education, they would have come provided.

He urged, too, that they should have received a proper literary education instead of a sham acquaintance with Latin, and insisted, as he had so often done, on the literary wealth of their own language.

Every one has his own ideas of what a liberal education ought to include, and a correspondent wrote to ask him, among other things, whether he did not think the higher mathematics ought to be included. He replied:—

GRAND HOTEL, EASTBOURNE, Aug. 16, 1890.

I think mathematical training highly desirable, but advanced mathematics, I am afraid, would be too great a burden in proportion to its utility, to the ordinary student.

I fully agree with you that the incapacity of teachers is the weak point in the London schools. But what is to be expected

when a man accepts a lectureship in a medical school simply as a grappling-iron by which he may hold on until he gets a hospital appointment?

Medical education in London will never be what it ought to be, until the "Institutes of Medicine," as the Scotch call them, are taught in only two or three well-found institutions—while the hospital schools are confined to the teaching of practical medicine, surgery, obstetrics, and so on.

The following letters illustrate Huxley's keenness to correct any misrepresentation of his opinions from a weighty source, and the way in which, without abating his just claims, he could make the peace gracefully.

In October Dr. Abbott delivered an address on "Illusions," in which, without, of course, mentioning names, he drew an unmistakable picture of Huxley as a thorough pessimist. A very brief report appeared in the *Times* of October 9, together with a leading article upon the subject. Huxley thereupon wrote to the *Times* a letter which throws light both upon his early days and his later opinions:—

The article on "Illusions" in the *Times* of to-day induces me to notice the remarkable exemplification of them to which you have drawn public attention. The Rev. Dr. Abbott has pointed the moral of his discourse by a reference to a living man, the delicacy of which will be widely and justly appreciated. I have reason to believe that I am acquainted with this person, somewhat intimately, though I can by no means call myself his best friend—far from it.

If I am right, I can affirm that this poor fellow did not escape from the "narrow school in which he was brought up" at nineteen, but more than two years later; and, as he pursued his studies in London, perhaps he had as much opportunities for "fruitful converse with friends and equals," to say nothing of superiors, as he would have enjoyed elsewhere.

Moreover, whether the naval officers with whom he conorted were book-learned or not, they were emphatically men, trained to face realities and to have a wholesome contempt for mere talkers. Any one of them was worth a wilderness of phrase-crammed undergraduates. Indeed, I have heard my misguided acquaintance declare that he regards his four years' training under the hard conditions and the sharp discipline of his cruise as an education of inestimable value.



As to being a "keen-witted pessimist out and out," the Rev. Dr. Abbott's "horrid example" has shown me the following sentence:—"Pessimism is as little consonant with the facts of sentient existence as optimism." He says he published it in 1888, in an article on "Industrial Development," to be seen in the *Nineteenth Century*. But no doubt this is another illusion. No superior person, brought up "in the Universities," to boot, could possibly have invented a myth so circumstantial.

The end of the correspondence was quite amicable. Dr. Abbott explained that he had taken his facts from the recently published "Autobiography," and that the reporters had wonderfully altered what he really said by large omissions. In a second letter (*Times*, October 11) Huxley says:—

I am much obliged to Dr. Abbott for his courteous explanation. I myself have suffered so many things at the hands of so many reporters—of whom it may too often be said that their "faith, unfaithful, makes them falsely true"—that I can fully enter into what his feelings must have been when he contemplated the picture of his discourse, in which the lights on "raw midshipmen," "pessimist out and out," "devil take the hindmost," and "Heine's dragoon," were so high, while the "good things" he was kind enough to say about me lay in the deep shadow of the invisible. And I can assure Dr. Abbott that I should not have dreamed of noticing the report of his interesting lecture, which I read when it appeared, had it not been made the subject of the leading article which drew the attention of all the world to it on the following day.

I was well aware that Dr. Abbott must have founded his remarks on the brief notice of my life which (without my knowledge) has been thrust into its present ridiculous position among biographies of eminent musicians; and most undoubtedly anything I have said there is public property. But erroneous suppositions imaginatively connected with what I have said appear to me to stand upon a different footing, especially when they are interspersed with remarks injurious to my early friends. Some of the "raw midshipmen and unlearned naval officers" of whom Dr. Abbott speaks, in terms which he certainly did not find in my "autobiography," are, I am glad to say, still alive, and are performing, or have performed, valuable services to their country. I wonder what Dr. Abbott would think, and perhaps say,

if his youthful University friends were spoken of as "raw curates and unlearned country squires."

When David Hume's housemaid was wroth because somebody chalked up "St. David's" on his house, the philosopher is said to have remarked,—“Never mind, lassie, better men than I have been made saints of before now.” And, perhaps, if I had recollected that “better men than I have been made texts of before now,” a slight flavour of wrath which may be perceptible would have vanished from my first letter. If Dr. Abbott has found any phrase of mine too strong, I beg him to set it against “out and out pessimists” and “Heine's dragoon,” and let us cry quits. He is the last person with whom I should wish to quarrel.

Two interesting criticisms of books follow; one *The First Three Gospels*, by the Rev. Estlin Carpenter; the other on *Use and Disuse*, directed against the doctrine of use-inheritance, by Mr. Platt Ball, who not only sent the book but appealed to him for advice as to his future course in undertaking a larger work on the evolution of man.

GRAND HOTEL, EASTBOURNE, Oct. 11, 1890.

MY DEAR MR. CARPENTER—Accept my best thanks for *The First Three Gospels*, which strikes me as an admirable exposition of the case, full, clear, and calm. Indeed the latter quality gives it here and there a touch of humour. You say the most damaging things in a way so gentle that the orthodox reader must feel like the eels who were skinned by the fair Molly—lost between pain and admiration.

I am certainly glad to see that the book has reached a second edition; it will do yeoman's service to the cause of right reason.

A quondam friend of mine was in the habit of sending me his proofs, and I sometimes wrote on them “no objection except to the whole”; and I am afraid that you will think what I am about to say comes to pretty much the same thing—at least if I am right in the supposition that a passage in your first preface (p. vii.) states your fundamental position, and that you conceive that when criticism has done its uttermost there still remains evidence that the personality of Jesus was the leading cause—the *conditio sine qua non*—of the evolution of Christianity from Judaism.

I long thought so, and having a strong dislike to belittle the heroic figures of history, I held by the notion as long as I could, but I find it melting away.

I cannot see that the moral and religious ideal of early Christianity is new—on the other hand, it seems to me to be implicitly and explicitly contained in the early prophetic Judaism and the later Hellenised Judaism; and though it is quite true that the new vitality of the old ideal manifested in early Christianity demands “an adequate historic cause,” I would suggest that the word “cause” may mislead if it is not carefully defined.

Medical philosophy draws a most useful and necessary distinction between “exciting” and “predisposing” causes—and nowhere is it more needful to keep this distinction in mind than in history—and especially in estimating the action of individuals on the course of human affairs. Platonic and Stoical philosophy—prophetic liberalism—the strong democratic socialism of the Jewish political system—the existence of innumerable sodalities for religious and social purposes—had thrown the ancient world into a state of unstable equilibrium. With such predisposing causes at work, the exciting cause of enormous changes might be relatively insignificant. The powder was there—a child might throw the match which should blow up the whole concern.

I do not want to seem irreverent, still less depreciatory, of noble men, but it strikes me that in the present case the Nazarenes were the match and Paul the child.

An ingrained habit of trying to explain the unknown by the known leads me to find the key to Nazarenism in Quakerism. It is impossible to read the early history of the Friends without seeing that George Fox was a person who exerted extraordinary influence over the men with whom he came in contact; and it is equally impossible (at least for me) to discover in his copious remains an original thought.

Yet what with the corruption of the Stuarts, the Phariseism of the Puritans, and the Sadduceism of the Church, England was in such a state, that before his death he had gathered about him a vast body of devoted followers, whose patient endurance of persecution is a marvel. Moreover, the Quakers have exercised a prodigious influence on later English life.

But I have scribbled a great deal too much already. You will see what I mean.

TO MR. W. PLATT BALL

GRAND HOTEL, EASTBOURNE, *Oct. 27, 1890.*

DEAR SIR—I have been through your book, which has greatly interested me, at a hand-gallop; and I have by no means

given it the attention it deserves. But the day after to-morrow I shall be going into a new house here, and it may be some time before I settle down to work in it—so that I prefer to seem hasty, rather than indifferent to your book and still more to your letter.

As to the book, in the first place. The only criticism I have to offer—in the ordinary depreciatory sense of the word—is that pp. 128-137 seem to me to require reconsideration, partly from a substantial and partly from a tactical point of view. There is much that is disputable on the one hand, and not necessary to your argument on the other.

Otherwise it seems to me that the case could hardly be better stated. Here are a few notes and queries that have occurred to me.

P. 41. Extinction of Tasmanians—rather due to the British colonist, who was the main agent of their extirpation, I fancy.

P. 67. Birds' sternums are a great deal more than surfaces of origin for the pectoral muscles—*e.g.* movable lid of respiratory bellows. This not taken into account by Darwin.

P. 85. "Inferiority of senses of Europeans" is, I believe, a pure delusion. Prof. Marsh told me of feats of American trappers equal to any savage doings. It is a question of attention. Consider wool-sorters, tea-tasters, shepherds who know every sheep personally, etc. etc.

P. 85. I do not understand about the infant's sole; since all men become bipeds, all must exert pressure on sole. There is no disuse.

P. 88. Has not "muscardine" been substituted for "pebrine"? I have always considered this a very striking case. Here is apparent inheritance of a diseased state through the mother only, quite inexplicable till Pasteur discovered the rationale.

P. 155. Have you considered that State Socialism (for which I have little enough love) may be a product of Natural Selection? The societies of Bees and Ants exhibit socialism *in excelsis*.

The unlucky substitution of "survival of fittest" for "natural selection" has done much harm in consequence of the ambiguity of "fittest"—which many take to mean "best" or "highest"—whereas natural selection may work towards degradation *vide cpizoa*.

You do not refer to the male mamma—which becomes functional once in many million cases, see the curious records of

Gynæcomasty. Here practical disuse in the male ever since the origin of the mammalia has not abolished the mamma or destroyed its functional potentiality in extremely rare cases.

I absolutely disbelieve in use-inheritance as the evidence stands. Spencer is bound to it *a priori*—his psychology goes to pieces without it.

Now as to the letter. I am no pessimist—but also no optimist. The world might be much worse, and it might be much better. Of moral purpose I see no trace in Nature. That is an article of exclusively human manufacture—and very much to our credit.

If you will accept the results of the experience of an old man who has had a very chequered existence—and has nothing to hope for except a few years of quiet downhill—there is nothing of permanent value (putting aside a few human affections), nothing that satisfies quiet reflection—except the sense of having worked according to one's capacity and light, to make things clear and get rid of cant and shams of all sorts. That was the lesson I learned from Carlyle's books when I was a boy, and it has stuck by me all my life.

Therefore, my advice to you is go ahead. You may make more of failing to get money, and of succeeding in getting abuse—until such time in your life as (if you are teachable) you have ceased to care much about either. The job you propose to undertake is a big one and will tax all your energies and all your patience.

But, if it were my case, I should take my chance of failing in a worthy task rather than of succeeding in lower things.

And if at any time I can be of use to you (even to the answering of letters) let me know. But in truth I am getting rusty in science—from disuse.—Ever yours very faithfully,

T. H. HUXLEY.

*P.S.*—Yes—Mr. Gladstone has dug up the hatchet. We shall see who gets the scalps.

By the way, you have not referred to plants, which are a stronghold for you. What is the good of use inheritance, say, in orchids?

The interests which had formerly been divided between biology and other branches of science and philosophy, were diverted from the one channel only to run stronger in the rest. Stagnation was the one thing impossible to him; his

rest was mental activity without excessive physical fatigue; and he felt he still had a useful purpose to serve, as a friend put it, in patrolling his beat with a vigilant eye to the loose characters of thought. Thus he writes on September 29 to Sir J. Hooker:—

I wish quietude of mind were possible to me. But without something to do that amuses me and does not involve too much labour, I become quite unendurable—to myself and everybody else.

Providence has, I believe, specially devolved on Gladstone, Gore, and Co. the function of keeping “'ome 'appy” for me.

I really can't give up tormenting *ces drôles*.

However, I have been toiling at a tremendously scientific article about the “Aryan question” absolutely devoid of blasphemy.

This article appeared in the November number of the *Nineteenth Century* (*Coll. Essays*, vii, 271) and treats the question from a biological point of view, with the warning to readers that it is essentially a speculation based upon facts, but not assuredly proved. It starts from the racial characteristics of skull and stature, not from simply philological considerations, and arrives at a form of the “Sarmatian” theory of Aryan origins. And for fear lest he should be supposed to take sides in the question of race and language, or race and civilisation, he remarks:—

The combination of swarthiness with stature above the average and a long skull, confer upon me the serene impartiality of a mongrel.

THE GRAND HOTEL, EASTBOURNE, *Aug. 12, 1890.*

MY DEAR EVANS—I have read your address returned herewith with a great deal of interest, as I happen to have been amusing myself lately with reviewing the “Aryan” question according to the new lights (or darknesses).

I have only two or three remarks to offer on the places I have marked A and B.

As to A, I would not state the case so strongly against the probabilities of finding pliocene man. A pliocene *Homo* skeleton might analogically be expected to differ no more from that of modern men than the *Ĉeningen Canis* from modern *Canes*, or pliocene horses from modern horses. If so, he would most

undoubtedly be a man—genus *Homo*—even if you made him a distinct species. For my part I should by no means be astonished to find the genus *Homo* represented in the Miocene, say the Neanderthal man with rather smaller brain capacity, longer arms and more movable great toe, but at most specifically different.

As to B, I rather think there were people who fought the fallacy of language being a test of race before Broca—among them thy servant—who got into considerable hot water on that subject for a lecture on the forefathers and forerunners of the English people, delivered in 1870. Taylor says that Cuno was the first to insist upon the proposition that race is not co-extensive with language in 1871. That is all stuff. The same thesis had been maintained before I took it up, but I cannot remember by whom.

Won't you refer to the Blackmore Museum? I was very much struck with it when at Salisbury the other day.

Hope they gave you a better lunch at Gloucester than we did here. We'll treat you better next time in our own den. With the wife's kindest regards—Ever yours very faithfully,

T. H. HUXLEY.

The remark in a preceding letter about "Gladstone, Gore, and Co." turned out to be prophetic as well as retrospective. Mr. Gladstone published this autumn in *Good Words* his "Impregnable Rock of Holy Scripture," containing an attack upon Huxley's position as taken up in their previous controversy of 1889.

The debate now turned upon the story of the Gadarene swine. The question at issue was not, at first sight, one of vital importance, and one critic at least remarked that at their age Mr. Gladstone and Professor Huxley might be better occupied than in fighting over the Gadarene pigs:—

If these two famous swine were the only parties to the suit, I for my part (writes Huxley, *Coll. Essays*, v. 414) should fully admit the justice of the rebuke. But the real issue (he contends) is whether the men of the nineteenth century are to adopt the demonology of the men of the first century, as divinely revealed truth, or to reject it as degrading falsity.

A lively encounter followed:—

The G.O.M. is not murdered (he writes on November 20), only "filipped with a three-man beetle," as the fat knight has it.

This refers to the forthcoming article in the December *Nineteenth Century*, "The Keepers of the Herd of Swine," which was followed in March 1891 by "Mr. Gladstone's Controversial Methods" (see *Coll. Essays*, v. 366 *sqq.*), the rejoinder to Mr. Gladstone's reply in February.

The scope of this controversy was enlarged by the intervention in the January *Nineteenth Century* of the Duke of Argyll, to whom he devoted the concluding paragraphs of his March article. But it was scarcely well under way when another, accompanied by much greater effusion of ink and passion, sprang up in the columns of the *Times*. His share in it, published in 1891 as a pamphlet under the title of "Social Diseases and Worse Remedies," is to be found in *Coll. Essays*, ix. 237.

I have a new row on hand *in re* Salvation Army (he writes on December 2)! It's all Mrs. ——'s fault; she offered the money.

In fact, a lady who was preparing to subscribe £1000 to "General" Booth's "Darkest England" scheme, begged Huxley first to give her his opinion of the scheme and the likelihood of its being properly carried out. A careful examination of "Darkest England" and other authorities on the subject convinced him that it was most unwise to create an organisation whose absolute obedience to an irresponsible leader might some day become a serious danger to the State; that the reforms proposed were already being undertaken by other bodies, which would be crippled if this scheme were floated; and that the financial arrangements of the Army were not such as provide guarantees for the proper administration of the funds subscribed:—

And if the thing goes on much longer, if Booth establishes his Bank, you will have a crash some of these fine days, comparable only to Law's Mississippi business, but unfortunately ruining only the poor.

On the same day he writes to his eldest son:—



HODESLEA, EASTBOURNE, *Dec.* 8, 1890.

Attacking the Salvation Army may look like the advance of a forlorn hope, but this old dog has never yet let go after fixing his teeth into anything or anybody, and he is not going to begin now. And it is only a question of holding on. Looking at Plumptre's letter exposing the Bank swindle.

The *Times*, too, is behaving like a brick. This world is not a very lovely place, but down at the bottom, as old Carlyle preached, veracity does really lie, and will show itself if people won't be impatient.

No sooner had he begun to express these opinions in the columns of the *Times* than additional information of all kinds poured in upon him, especially from within the Army, much of it private for fear of injury to the writers if it were discovered that they had written to expose abuses; indeed in one case the writer had thought better of even appending his signature to his letter, and had cut off his name from the foot of it, alleging that correspondence was not inviolable. So far were these persons from feeling hostility to the organisation to which they belonged, that one at least hailed the Professor as the divinely-appointed redeemer of the Army, whose criticism was to bring it back to its pristine purity.

### TO HIS ELDER SON

HODESLEA, EASTBOURNE, *Jan.* 8, 1891.

DEAR LENS—It is very jolly to think of J. and you paying us a visit. It is proper, also, the eldest son should hansom the house.

Is the Mr. Sidgwick who took up the cudgels for me so gallantly in the *St. James'* one of your Sidgwicks? If so, I wish you would thank him on my account. (The letter was capital.)\* Generally people like me to pull the chestnuts out of the fire for

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\* Mr. William C. Sidgwick had written (January 4) an indignant letter to protest against the heading of an article in the *Speaker*, "Professor Huxley as Titus Oates." "To this monster of iniquity the *Speaker* compares an honourable English gentleman, because he has ventured to dissuade his countrymen from giving money to Mr. William Booth. . . Mr. Huxley's views on theology may be wrong, but nobody doubts that he honestly holds them; they do not bring Mr.

them, but don't care to take any share in the burning of the fingers.

But the Boothites are hard hit, and may be allowed to cry out.

I begin to think that they must be right in saying that the Devil is at work to destroy them. No other theory sufficiently accounts for the way they play into my hands. Poor Clibborn-Booth has a long—columns long—letter in the *Times* to-day, in which, all unbeknownst to himself, he proves my case.

I do believe it is a veritable case of the herd of swine, and I shall have to admit the probability of that miracle.

Love to J. and Co. from us all.—Ever your affectionate

PATER.

HODESLEA, EASTBOURNE, *Jan. II, 1891.*

MY DEAR MR. CLODD—I am very much obliged to you for the number of the *St. James's Gazette*, which I had not seen. The leading article expresses exactly the same conclusions as those at which I had myself arrived from the study of the deed of 1878. But of course I was not going to entangle myself in a legal discussion. However, I have reason to know that the question will be dealt with by a highly qualified legal expert before long. The more I see of the operations of headquarters the worse they look. I get some of my most valuable information and heartiest encouragement from officers of the Salvation Army; and I knew, in this way, of Smith's resignation a couple of days before it was announced! But the poor fellows are so afraid of spies and consequent persecution, that some implore me not to notice their letters, and all pledge me to secrecy. So that I am Vice-Fontanelle with my hand full of truth, while I can only open my little finger.

It is a case of one down and t'other come on, just now. "—" will get his deserts in due time. But, oh dear, what a waste of time for a man who has not much to look to. No; "waste" is the wrong word; it's useful, but I wish that somebody else would do it and leave me to my books.

My wife desires her kind regards. I am happy to say she is now remarkably well. If you are this way, pray look in at our Hermitage.—Yours very faithfully,  
T. H. HUXLEY.

Huxley wealth and honours, nor do they cause the murder of the innocent. To insinuate a resemblance which you dare not state openly is an outrage on common decency. . . ."

HODESLEA, EASTBOURNE, *Jan. 30, 1891.*

MY DEAR HOOKER—I trust I have done with Booth and Co. at last. What an ass a man is to try to prevent his fellow-creatures from being humbugged! Surely I am old enough to know better. I have not been so well abused for an age. It's quite like old times.

And now I have to settle accounts with the duke and the G.O.M. I wonder when the wicked will let me be at peace.—  
Ever yours affectionately, T. H. HUXLEY.

Other letters touch upon the politics of the hour, especially upon the sudden and dramatic fall of Parnell. He could not but admire the power and determination of the man, and his political methods, an admiration rashly interpreted by some journalist as admiration of the objects to which these political methods were applied. (See p. 134.)

GRAND HOTEL, EASTBOURNE, *Nov. 26, 1890.*

MY DEAR LECKY—Very many thanks for your two volumes, which I rejoice to have, especially as a present from you. I was only waiting until we were settled in our new house—as I hope we shall be this time next week—to add them to the set which already adorn my shelves, and I promise myself soon to enjoy the reading of them.

The Unionist cause is looking up. What a strange thing it is that the Irish malcontents are always sold, one way or the other, by their leaders.

I wonder if the G.O.M. ever swears! Pity if he can't have that relief just now.

With our united kind regards to Mrs. Lecky and yourself—  
Ever yours very faithfully, T. H. HUXLEY.

GRAND HOTEL, EASTBOURNE, *Nov. 29, 1890.*

MY DEAR HOOKER—I have filled up and sent your and my copies of entry for Athenæum.

Carpenter has written the best popular statement I know of, of the results of criticism, in a little book called *The First Three Gospels*, which is well worth reading. [See p. 282.]

I have promised to go to R.S. dinner and propose Stokes' health on Monday, but if the weather holds out as Arctic as it is now, I shall not dare to venture. The driving east wind, blowing the snow before it here, has been awful; for ten years they have had nothing like it. I am glad to say that my little

house turns out to be warm. We go in next Wednesday, and I fear I cannot be in town on Thursday even if the weather permits.

I have had pleurisy that was dangerous and not painful, then *p.* that was painful and not dangerous; there is only one further combination, and I don't want that.

Politics now are immensely interesting. There must be a depth of blackguardism in me, for I cannot help admiring Parnell. I prophesy that it is Gladstone who will retire for a while, and then come back to Parnell's heel like a whipped hound. His letter was carefully full of loopholes—Ever yours affectionately,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *Dec. 2, 1890.*

MY DEAR HOOKER— . The question of questions now is whether the Unionists will have the sense to carry a measure settling the land question at once. If they do that, I do not believe it will be in the power of man to stir them further. And my belief is that Parnell will be quite content with that solution. He does not want to be made a nonentity by Davitt or the Irish Americans.

But what ingrained liars they all are! That is the bottom of all Irish trouble. Fancy Healy and Sexton going to Dublin to swear eternal fidelity to their leader, and now openly declaring that they only did so because they believed he would resign.—Ever yours affectionately.

T. H. HUXLEY.

HODESLEA, *Jan. 10, 1891.*

MY DEAR FOSTER—I am trying to bring the Booth business to an end so far as I am concerned, but it's like getting a wolf by the ears; you can't let him go exactly when you like.

But the result is quite worth the trouble. Booth, Stead, Tillett, Manning and Co. have their little game spoilt for the present.

You cannot imagine the quantity of letters I get from the Salvation Army subordinates, thanking me and telling me all sorts of stories in strict confidence. The poor devils are frightened out of their lives by headquarter spies. Some beg me not to reply, as their letters are opened.

I knew that saints were not bad hands at lying before; but these Booth people beat Banagher.

Then there is — awaits skinning, and I believe the G.O.M. is to be upon me! Oh for a quiet life.—Ever yours faithfully,

T. H. HUXLEY.

But by February 17 the Booth business was over, the final rejoinder to Mr. Gladstone sent to press; and he writes to Sir J. Hooker:—

Please the pigs, I have now done with them—wiped my mouth, and am going to be good—till next time.

But in truth I am as sick of controversy as a confectioner's boy of tarts.

I rather think I shall set up as a political prophet. Gladstone and all the rest are coming to heel to their master.

Years ago one of the present leaders of the anti-Parnellites said to me: "Gladstone is always in the hands of somebody stronger than himself; formerly it was Bright, now it is Parnell."

## CHAPTER XVII

1890-91

THE new house at Eastbourne has been several times referred to. As usually happens, the move was considerably delayed by the slowness of the workmen; it did not actually take place till the beginning of December.

He writes to his daughter, Mrs. Roller, who also had just moved into a new house:—

You have all my sympathies on the buy, buy question. I never knew before that when you go into a new house money runs out at the heels of your boots. On former occasions, I have been too busy to observe the fact. But I am convinced now that it is a law of nature.

The origin of the name given to the house appears from the following letter:—

GRAND HOTEL, EASTBOURNE, *Oct. 15, 1890.*

MY DEAR FOSTER — Best thanks for the third part of the “Physiology,” which I found when I ran up to town for a day or two last week. What a grind that book must be!

How’s a’ wi’ you? Let me have a line.

We ought to have been in our house a month ago, but fitters, paperers, and polishers are like bugs or cockroaches, you may easily get ’em in, but getting ’em out is the deuce. However, I hope to clear them out by the end of this week, and get in by the end of next week.

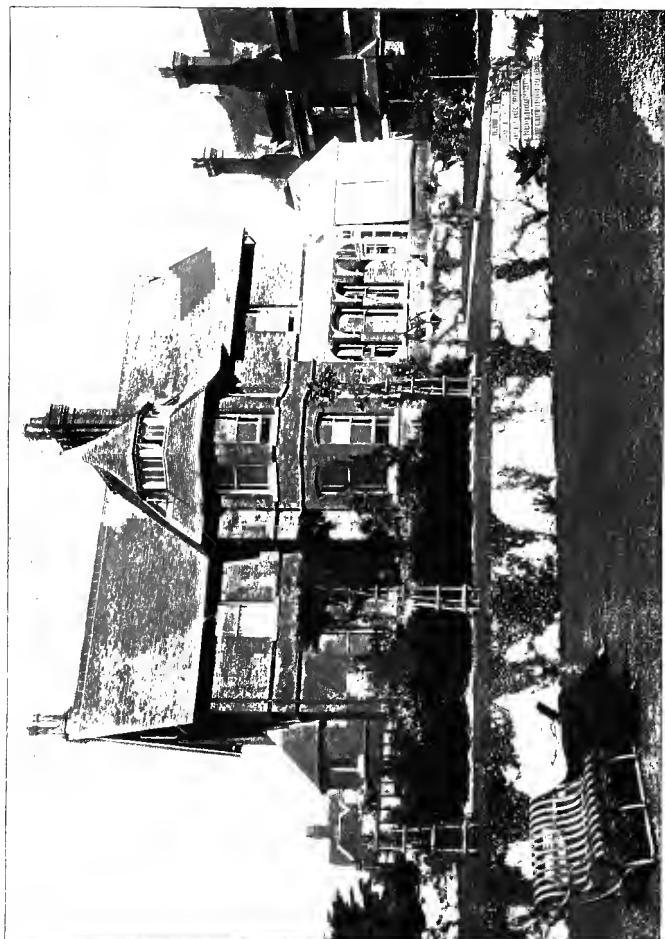
One is obliged to have names for houses here. Mine will be “Hodeslea,” which is as near as I can go to “Hodesleia,” the poetical original shape of my very ugly name.

There was a noble scion of the house of Huxley of Huxley who, having burgled and done other wrong things (temp. Henry









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IV.), asked for benefit of clergy. I expect they gave it him, not in the way he wanted, but in the way they would like to "benefit" a later member of the family.

[Rough sketch of one priest hauling the rope taut over the gallows, while another holds a crucifix before the suspended criminal.]

Between this gentleman and my grandfather there is unfortunately a complete blank, but I have none the less faith in him as my ancestor.

My wife, I am sorry to say, is in town—superintending packing up—no stopping her. I have been very uneasy about her at times, and shall be glad when we are quietly settled down. With kindest regards to Mrs. Foster—Ever yours,

T. H. HUXLEY.

His own principal task was in getting his library ready for the move.

Most of my time (he writes on November 16) for the last fortnight has been spent in arranging books and tearing up papers till my back aches and my fingers are sore.

However, he did not take all his books with him. There was a quantity of biological works of all sorts which had accumulated in his library and which he was not likely to use again; these he offered as a parting gift to the Royal College of Science. On December 8, the Registrar conveys to him the thanks of the Council for "the valuable library of biological works," and further informs him that it was resolved—

That the library shall be kept in the room formerly occupied by the Dean, which shall be called "The Huxley Laboratory for Biological Research," and be devoted to the prosecution of original researches in Biological Science, with which the name of Professor Huxley is inseparably associated.

Huxley replied as follows:—

DEAR REGISTRAR—I beg you convey my hearty thanks to the Council for the great kindness of the minute and resolution which you have sent me. My mind has never been greatly set on posthumous fame; but there is no way of keeping memory green which I should like so well as that which they have adopted towards me.

It has been my fate to receive a good deal more vilipending than (I hope) I deserve. If my colleagues, with whom I have worked so long, put too high a value upon my services, perhaps the result may be not far off justice.—Yours very faithfully,  
T. H. HUXLEY.

In addition to the directly controversial articles in the early part of the year, two other articles on controversial subjects belong to 1891. "Hasisadra's Adventure," published in the *Nineteenth Century* for June, completed his long-contemplated examination of the Flood myth. In this he first discussed the Babylonian form of the legend recorded upon the clay tablets of Assurbanipal—a simpler and less exaggerated form as befits an earlier version, and in its physical details keeping much nearer to the bounds of probability.

The greater part of the article, however, is devoted to a wider question—How far does geological and geographical evidence bear witness to the consequences which must have ensued from a universal flood, or even from one limited to the countries of Mesopotamia? And he comes to the conclusion that these very countries have been singularly free from any great changes of the kind for long geological periods.

The sarcastic references in this article to those singular reasoners who take the possibility of an occurrence to be the same as scientific testimony to the fact of its occurrence, lead up, more or less, to the subject of an essay, "Possibilities and Impossibilities," which appeared in the *Agnostic Annual* for 1892, actually published in October 1891, and to be found in *Collected Essays*, v. 192.

This was a restatement of the fundamental principles of the agnostic position, arising out of the controversies of the last two years upon the demonology of the New Testament. The miraculous is not to be denied as impossible; as Hume said, "Whatever is intelligible and can be distinctly conceived implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning *a priori*," and these combinations of phenomena are perfectly conceivable. Moreover, in the progress of knowl-

edge, the miracles of to-day may be science of to-morrow. Improbable they are, certainly, by all experience, and therefore they require specially strong evidence. But this is precisely what they lack; the evidence to them, when examined, turns out to be of doubtful value.

I am anxious (he says) to bring about a clear understanding of the difference between "impossibilities" and "improbabilities," because mistakes on this point lay us open to the attacks of ecclesiastical apologists of the type of the late Cardinal Newman. . . .

When it is rightly stated, the Agnostic view of "miracles" is, in my judgment, unassailable. We are *not* justified in the *a priori* assertion that the order of nature, as experience has revealed it to us, cannot change. In arguing about the miraculous, the assumption is illegitimate, because it involves the whole point in dispute. Furthermore, it is an assumption which takes us beyond the range of our faculties. Obviously, no amount of past experience can warrant us in anything more than a correspondingly strong expectation for the present and future. We find, practically, that expectations, based upon careful observations of past events, are, as a rule, trustworthy. We should be foolish indeed not to follow the only guide we have through life. But, for all that, our highest and surest generalisations remain on the level of justifiable expectations; that is, very high probabilities. For my part, I am unable to conceive of an intelligence shaped on the model of that of men, however superior it might be, which could be any better off than our own in this respect; that is, which could possess logically justifiable grounds for certainty about the constancy of the order of things, and therefore be in a position to declare that such and such events are impossible. Some of the old mythologies recognised this clearly enough. Beyond and above Zeus and Odin, there lay the unknown and inscrutable Fate which, one day or other, would crumple up them and the world they ruled to give place to a new order of things.

I sincerely hope that I shall not be accused of Pyrrhonism, or of any desire to weaken the foundations of rational certainty. I have merely desired to point out that rational certainty is one thing, and talk about "impossibilities," or "violation of natural laws," another. Rational certainty rests upon two grounds: the one that the evidence in favour of a given statement is as good as it can be; the other, that such evidence is plainly insufficient.

In the former case, the statement is to be taken as true, in the latter as untrue; until something arises to modify the verdict, which, however properly reached, may always be more or less wrong, the best information being never complete, and the best reasoning being liable to fallacy.

To quarrel with the uncertainty that besets us in intellectual affairs would be about as reasonable as to object to live one's life, with due thought for the morrow, because no man can be sure he will be alive an hour hence. Such are the conditions imposed upon us by nature, and we have to make the best of them. And I think that the greatest mistake those of us who are interested in the progress of free thought can make is to overlook these limitations, and to deck ourselves with the dogmatic feathers which are the traditional adornment of our opponents. Let us be content with rational certainty, leaving irrational certainties to those who like to muddle their minds with them.

As for the difficulty of believing miracles in themselves, he gives in this paper several examples of a favourite saying of his, that Science offers us much greater marvels than the miracles of theology; only the evidence for them is very different.

The following letter was written in acknowledgment of a paper by the Rev. E. McClure, which endeavoured to place the belief in an individual permanence upon the grounds that we know of no leakage anywhere in nature; that matter is not a source, but a transmitter of energy; and that the brain, so far from originating thought, is a mere machine responsive to something external to itself, a revealer of something which it does not produce, like a musical instrument. This "something" is the universal of thought, which is identified with the general *λόγος* of the fourth gospel. Moral perfection consists in assimilation to this; sin is the falling short of perfect revealing of the eternal *λόγος*.

Huxley's reply interested his correspondent not only for the brief opinion on the philosophic question, but for the personal touch in the explanation of the motives which had guided his life-work, and his "kind feeling towards such of the clergy as endeavoured to seek honestly for a natural basis to their faith."

HODESLEA, EASTBOURNE, *March 17, 1891.*

DEAR MR. McCLURE — I am very much obliged for your letter, which belongs to a different category from most of those which I receive from your side of the hedge that, unfortunately, separates thinking men.

So far as I know myself, after making due deduction for the ambition of youth and a fiery temper, which ought to (but unfortunately does not) get cooler with age, my sole motive is to get at the truth in all things.

I do not care one straw about fame, present or posthumous, and I loathe notoriety, but I do care to have that desire manifest and recognised.

Your paper deals with a problem which has profoundly interested me for years, but which I take to be insoluble. It would need a book for full discussion. But I offer a remark only on two points.

The doctrine of the conservation of energy tells neither one way nor the other. Energy is the cause of movement of body, *i.e.* things having mass. States of consciousness have no mass, even if they can be conceded to be movable. Therefore even if they are caused by molecular movements, they would not in any way affect the store of energy.

Physical causation need not be the only kind of causation, and when Cabanis said that thought was a function of the brain, in the same way as bile secretion is a *function* of the liver, he blundered philosophically. Bile is a product of the transformation of material energy. But in the mathematical sense of the word "function," thought may be a function of the brain. That is to say, it may arise only when certain physical particles take on a certain order.

By way of a coarse analogy, consider a parallel-sided piece of glass through which light passes. It forms no picture. Shape it so as to be bi-convex, and a picture appears in its focus.

Is not the formation of the picture a "function" of the piece of glass thus shaped?

So, from your own point of view, suppose a mind-stuff—*λόγος*—a noumenal cosmic light such as is shadowed in the fourth gospel. The brain of a dog will convert it into one set of phenomenal pictures, and the brain of a man into another. But in both cases the result is the consequence of the way in which the respective brains perform their "functions."

Yet one point.

The actions we call sinful are as much the consequence of

the order of nature as those we call virtuous. They are part and parcel of the struggle for existence through which all living things have passed, and they have become sins because man alone seeks a higher life in voluntary association.

Therefore the instrument has never been marred; on the contrary, we are trying to get music out of harps, sacbuts, and psalteries, which never were in tune and seemingly never will be.—Ever yours very faithfully,  
T. H. HUXLEY.

Few years passed without some utterance from Huxley on the subject of education, especially scientific education. This year we have a letter to Professor Ray Lankester touching the science teaching at Oxford.

HODESLEA, EASTBOURNE, *Jan. 28, 1891.*

DEAR LANKESTER—I met Foster at the Athenæum when I was in town last week, and we had some talk about your “very gentle” stirring of the Oxford pudding. I asked him to let you know when occasion offered, that (as I had already said to Burdon Sanderson) I drew a clear line *apud* biology between the medical student and the science student.

With respect to the former, I consider it ought to be kept within strict limits, and made simply a *Vorschule* to human anatomy and physiology.

On the other hand, the man who is going out in natural science ought to have a much larger dose, especially in the direction of morphology. However, from what I understand from Foster, there seems a doubt about the “going out” in *Natural Science*, so I had better confine myself to the medicos. Their burden is already so heavy that I do not want to see it increased by a needless weight even of elementary biology.

Very many thanks for the “Zoological articles” just arrived.—Ever yours very faithfully,  
T. H. HUXLEY.

Don't write to the *Times* about anything; look at the trouble that comes upon a harmless man for two months, in consequence.

The following letter, which I quote from the *Yorkshire Herald* of April 11, 1891, was written in answer to some enquiries from Mr. J. Harrison, who read a paper on Technical Education as applied to Agriculture, before the Easingwold Agricultural Club:—

I am afraid that my opinion upon the subject of your enquiry is worth very little—my ignorance of practical agriculture being



profound. However, there are some general principles which apply to all technical training; the first of these, I think, is that practice is to be learned only by practice. The farmer must be made by and through farm work. I believe I might be able to give you a fair account of a bean plant and of the manner and condition of its growth, but if I were to try to raise a crop of beans, your club would probably laugh consumedly at the result. Nevertheless, I believe that you practical people would be all the better for the scientific knowledge which does not enable me to grow beans. It would keep you from attempting hopeless experiments, and would enable you to take advantage of the innumerable hints which Dame Nature gives to people who live in direct contact with things. And this leads me to the second general principle which I think applies to all technical teaching for school-boys and school-girls, and that is, that they should be led from the observation of the commonest facts to general scientific truths. If I were called upon to frame a course of elementary instruction preparatory to agriculture, I am not sure that I should attempt chemistry, or botany, or physiology or geology, as such. It is a method fraught with the danger of spending too much time and attention on abstraction and theories, on words and notions instead of things. The history of a bean, of a grain of wheat, of a turnip, of a sheep, of a pig, or of a cow properly treated—with the introduction of the elements of chemistry, physiology, and so on as they come in—would give all the elementary science which is needed for the comprehension of the processes of agriculture in a form easily assimilated by the youthful mind, which loathes everything in the shape of long words and abstract notions, and small blame to it. I am afraid I shall not have helped you very much, but I believe that my suggestions, rough as they are, are in the right direction.

The perversion of the new Chair of English Literature at Oxford to "Middle English" philology was the occasion of the following letter, which appeared in the *Pall Mall Gazette* of October 22, 1891 :—

I fully agree with you that the relation of our Universities to the study of English literature is a matter of great public importance; and I have more than once taken occasion to express my conviction—Firstly, that the works of our great English writers are pre-eminently worthy of being systematically studied in our schools and universities as literature; and second-

ly, that the establishment of professional chairs of philology, under the name of literature, may be a profit to science, but is really a fraud practised upon letters.

That a young Englishman may be turned out of one of our universities, "epopt and perfect" so far as their system takes him, and yet ignorant of the noble literature which has grown up in those islands during the last three centuries, no less than of the development of the philosophical and political ideas which have most profoundly influenced modern civilisation, is a fact in the history of the nineteenth century which the twentieth will find hard to believe; though, perhaps, it is not more incredible than our current superstition that whoso wishes to write and speak English well should mould his style after the models furnished by classical antiquity. For my part, I venture to doubt the wisdom of attempting to mould one's style by any other process than that of striving after the clear and forcible expression of definite conceptions; in which process the Glassian precept, "first catch your definite conceptions," is probably the most difficult to obey. But still I mark among distinguished contemporary speakers and writers of English, saturated with antiquity, not a few to whom, it seems to me, the study of Hobbes might have taught dignity; of Swift, concision and clearness; of Goldsmith and Defoe, simplicity.

Well, among a hundred young men whose university career is finished, is there one whose attention has ever been directed by his literary instructors to a page of Hobbes, or Swift, or Goldsmith, or Defoe? In my boyhood we were familiar with *Robinson Crusoe*, *The Vicar of Wakefield*, and *Gulliver's Travels*; and though the mysteries of "Middle English" were hidden from us, my impression is we ran less chance of learning to write and speak the "middling English" of popular orators and headmasters than if we had been perfect in such mysteries and ignorant of those three masterpieces. It has been the fashion to decry the eighteenth century, as young fops laugh at their fathers. But we were there in germ; and a "Professor of Eighteenth Century History and Literature" who knew his business might tell young Englishmen more of that which it is profoundly important they should know, but which at present remains hidden from them, than any other instructor; and, incidentally, they would learn to know good English when they see or hear it—perhaps even to discriminate between slipshod copiousness and true eloquence, and that alone would be a great gain.

The remaining letters of the year are of miscellaneous interest. They show him happily established in his retreat at Eastbourne in very fair health, on his guard against any further repetition of his "jubilee honour" in the shape of his old enemy pleurisy; unable to escape the more insidious attacks of influenza, but well enough on the whole to be in constant good spirits.

HODESLEA, EASTBOURNE, *Jan. 13, 1891.*

MY DEAR SKELTON—Many thanks to you for reminding me that there are such things as "Summer Isles" in the universe. The memory of them has been pretty well blotted out here for the last seven weeks. You see some people can retire to "Hermitages" as well as other people; and though even Argyll *cum* Gladstone powers of self-deception could not persuade me that the view from my window is as good as that from yours, yet I do see a fine wavy chalk down with "cwms" and soft turfy ridges, over which an old fellow can stride as far as his legs are good to carry him.

The fact is, that I discovered that staying in London any longer meant for me a very short life, and by no means a merry one. So I got my son-in-law to build me a cottage here, where my wife and I may go down-hill quietly together, and "make our sows" as the Irish say, solaced by an occasional visit from children and grandchildren.

The deuce of it is, that however much the weary want to be at rest the wicked won't cease from troubling. Hence the occasional skirmishes and alarms which may lead my friends to mis-doubt my absolute detachment from sublunary affairs. Perhaps peace dwells only among the fork-tailed Petrels!

I trust Mrs. Skelton and you are flourishing, and that trouble will keep far from the hospitable doors of Braid through the New Year.—Ever yours very faithfully,

T. H. HUXLEY.

No sooner had he settled down in his new country home, than a strange piece of good fortune, such as happens more often in a story-book than in real life, enabled him at one stroke to double his little estate, to keep off the unwelcome approach of the speculative builder, and to give himself scope for the newly-discovered delights of the garden. The sale of the house in Marlborough Place covered the greater

part of the cost of Hodeslea; but almost on the very day on which the sale was concluded, he became the possessor of another house at Worthing by the death of Mr. Anthony Rich, the well-known antiquarian. An old man, almost alone in the world, his admiration for the great work done recently in natural science had long since led him to devise his property to Darwin and Huxley, to the one his private fortune, to the other his house and its contents, notably a very interesting library.

As a matter of feeling, Huxley was greatly disinclined to part with this house, Chapel Croft, as soon as it had come into his hands. A year earlier, he might have made it his home; but now he had settled down at Eastbourne, and Chapel Croft, as it stood, was unlikely to find a tenant. Accordingly he sold it early in July, and with the proceeds bought the piece of land adjoining his house. Thus he writes to Sir J. Hooker:—

HODESLEA, EASTBOURNE, *May 17, 1891.*

MY DEAR HOOKER—My estate is somewhat of a white elephant. There is about a couple of acres of ground well situated and half of it in the shape of a very pretty lawn and shrubbery, but unluckily, in building the house, dear old Rich thought of his own convenience and not mine (very wrong of him!), and I cannot conceive anybody but an old bachelor or old maid living in it. I do not believe anybody would take it as it stands. No doubt the site is valuable, and it would be well worth while to anybody with plenty of cash to spare to build on to the house and make it useful. But I neither have the cash, nor do I want the bother. However, Waller is going to look at the place for me and see what can be done. It seems hardly decent to sell it at once; and moreover the value is likely to increase. I suppose at present it is worth £2000, but that is only a guess.

*Apropos* of naval portrait gallery, can you tell me if there is a portrait of old John Richardson anywhere extant? I always look upon him as the founder of my fortunes, and I want to hang him up (just over your head) on my chimney breast. Voici! [sketch showing the position of the pictures above the fireplace]:—

By your fruits ye shall judge them! My cold was influenza, I have been in the most preposterously weak state ever since;

and at last my wife lost patience and called in the doctor, who is screwing me up with *nux vomica*.

Sound wind and limb otherwise.—Ever yours affectionately,  
T. H. HUXLEY.

And again on July 3:—

I have just been offered £2800 for Anthony Rich's place and have accepted it. It is probably worth £3000, but if I were to have it on my hands and sell by auction I should get no more out of the transaction.

I am greatly inclined to put some of the money into a piece of land—a Naboth's vineyard—in front of my house and turn horticulturist. I find nailing up creepers a delightful occupation.

In the same letter he describes two meetings with old friends:—

Last Friday I ran down to Hindhead to see Tyndall. He was very much better than I hoped to find him, after such a long and serious illness, quite bright and "Tyndalloid," and not aged as I feared he would be. . . . The local doctor happened to be there during my visit and spoke very confidently of his speedy recovery. The leg is all right again, and he even talks of Switzerland, but I begged Mrs. Tyndall to persuade him to keep quiet and within reach of home and skilled medical attendance.

Saturday to Monday we were at Down, after six or seven years' interruption of our wonted visits. It was very pleasant if rather sad. Mrs. Darwin is wonderfully well—naturally aged—but quite bright and cheerful as usual. Old Parslow turned up on Sunday, just eighty, but still fairly hale. *Fuimus fuimus!*

[Parslow was the old butler who had been in Mr. Darwin's service for many years.]

TO HIS DAUGHTER, MRS. ROLLER

HODESLEA, EASTBOURNE, *May 5, 1891.*

You dear people must have entered into a conspiracy, as I had letters from all yesterday. I have never been so set up before, and begin to think that fathers (like port) must improve in quality with age. (No irreverent jokes about their getting crusty, Miss.)

Julian and Joyce taken together may perhaps give a faint idea of my perfections as a child. I have not only a distinct recollection of being noticed on the score of my good looks, but

my mother used to remind me painfully of them in my later years, looking at me mournfully and saying, "And you were such a pretty boy!"

Much as he would have liked to visit the Maloja again this year, the state of his wife's health forbade such a long journey. He writes just after his attack of influenza to Sir M. Foster, who had been suffering in the same way:—

HODESLEA, *May 12, 1891.*

MY DEAR FOSTER—I was very glad to hear from you. Pray don't get attempting to do anything before you are set up again.

I am in a ridiculous state of weakness, and bless my stars that I have nothing to do. I find it troublesome to do even that.

I wish ballooning had advanced so far as to take people to Maloja, for I do not think my wife ought to undertake such a journey, and yet I believe the high air would do us both more good than anything else. . . .

The University of London scheme appears to be coming to grief, as I never doubted it would.—Ever yours,

T. H. HUXLEY.

So instead of going abroad, he stayed in Eastbourne till the end of August, receiving a short visit from his old friend Jowett, who, though sadly enfeebled by age, still persisted in travelling by himself, and a longer visit from his elder son and his family. But from September 11 to the 26th he and his wife made a trip through the west country, starting from Salisbury, which had so delighted him the year before, and proceeding by way of the Wye valley, which they had not visited since their honeymoon, to Llangollen. The first stage on the return journey was Chester, whence they made pious pilgrimage to the cradle of his name, Old Huxley Hall, some 9 miles from Chester. Incorporated with a modern farm-house, and forming the present kitchen, are some solid stone walls, part of the old manor-house, now no longer belonging to any one of the name. From here they went to Coventry, where he had lived as a boy, and found the house which his father had occupied still standing.

A letter to an old pupil contains reflections upon the years of work to which he had devoted so much of his energies.

TO PROFESSOR T. JEFFERY PARKER, OTAGO

HODESLEA, EASTBOURNE, *Aug.* 11, 1891.

MY DEAR PARKER—It is a long time since your letter reached me, but I was so unwise as to put off answering it until the book arrived and I had read it. The book did not reach me for a long time, and what with one thing and another I have but just finished it. I assure you I am very proud of having my name connected with such a thorough piece of work, no less than touched by the kindness of the dedication.

Looking back from the aged point of view, the life which cost so much wear and tear in the living seems to have effected very little, and it is cheering to be reminded that one has been of some use.

Some years of continued ill-health, involving constant travelling about in search of better conditions than London affords, and long periods of prostration, have driven me quite out of touch with science. And indeed except for a certain toughness of constitution I should have been driven out of touch with terrestrial things altogether.

It is almost indecent in a man at my time of life who has had two attacks of pleurisy, followed by a dilated heart, to be not only above ground but fairly vigorous again. However, I am obliged to mind my P's and Q's; avoid everything like hard work, and live in good air.

The last condition we have achieved by setting up a house close to the downs here; and I begin to think with *Candide* that "cultivons notre jardin" comprises the whole duty of man.

I was just out of the way of hearing anything about the University College chair; and indeed, beyond attending the Council of the school when necessary, and meetings of Trustees of the British Museum, I rarely go to London.

I have had my innings, and it is now for the younger generation to have theirs.—With best wishes, ever yours very faithfully,

T. H. HUXLEY.

As for being no longer in touch with the world of science, he says the same thing in a note to Sir M. Foster, forwarding an inquiry after a scientific teacher (August 1).

Please read the enclosed, and if you know of anybody suitable please send his name to Mr. Thomas.

I have told him that I am out of the way of knowing, and

that you are physiologically omniscient, so don't belie the character!

This year a number of Huxley's essays were translated into French. *Nature* for July 23, 1891 (vol. xliv, p. 272), notes the publication of "Les Sciences Naturelles et l'Éducation," with a short preface by himself, dwelling upon the astonishing advance which had been made in the recognition of science as an instrument of education, but warning the younger generation that the battle is only half won, and bidding them beware of relaxing their efforts before the place of science is entirely assured. In the issue for December 31 (*Nature*, 46, 397), is a notice of "La Place 'de l'Homme dans la Nature," a re-issue of a translation of more than twenty years before, together with three ethnological essays, newly translated by M. H. de Varigny, to whom the following letters are addressed.

#### TO H. DE VARIGNY

May 17, 1891.

I am writing to my publishers to send you *Lay Sermons*, *Critiques*, *Science and Culture*, and *American Addresses*, pray accept them in expression of my thanks for the pains you are taking about the translation. *Man's Place in Nature* has been out of print for years, so I cannot supply it.

I am quite conscious that the condensed and idiomatic English into which I always try to put my thoughts must present many difficulties to a translator. But a friend of mine who is a much better French scholar than I am, and who looked over two or three of the essays, told me he thought you had been remarkably successful.

The fact is that I have a great love and respect for my native tongue, and take great pains to use it properly. Sometimes I write essays half-a-dozen times before I can get them into the proper shape; and I believe I become more fastidious as I grow older.

November 25, 1891.

I am very glad you have found your task pleasant, for I am afraid it must have cost you a good deal of trouble to put my ideas into the excellent French dress with which you have provided them. It fits so well that I feel almost as if I might be a candidate for a seat among the immortal forty!



As to the new volume you shall have the refusal of it if you care to have it. But I have my doubts about its acceptability to a French public which I imagine knows little about Bibliolatry and the ways of Protestant clericalism, and cares less.

These essays represent a controversy which has been going on for five or six years about Genesis, the deluge, the miracle of the herd of swine, and the miraculous generally, between Gladstone, the ecclesiastical principal of King's College, various bishops, the writer of *Lux Mundi*, that spoilt Scotch minister the Duke of Argyll, and myself.

My object has been to stir up my countrymen to think about these things; and the only use of controversy is that it appeals to their love of fighting, and secures their attention.

I shall be very glad to have your book on *Experimental Evolution*. I insisted on the necessity of obtaining experimental proof of the possibility of obtaining virtually infertile breeds from a common stock in 1860 (in one of the essays you have translated). Mr. Tegetmeier made a number of experiments with pigeons some years ago, but could obtain not the least approximation to infertility.

From the first, I told Darwin this was the weak point of his case from the point of view of scientific logic. But, in this matter, we are just where we were thirty years ago, and I am very glad you are going to call attention to the subject.

Sending a copy of the translation soon after to Sir J. Hooker, he writes:—

HODESLEA, EASTBOURNE, *Jan. 11, 1892.*

MY DEAR HOOKER—We have been in the middle of snow for the last four days. I shall not venture to London, and if you deserve the family title of the "judicious," I don't think you will either.

I send you by this post a volume of the French translation of a collection of my essays about Darwinism and Evolution, 1860-76, for which I have written a brief preface. I was really proud of myself when I discovered on re-reading them that I had nothing to alter.

What times those days were! *Fuimus!*—Ever yours affectionately,  
T. H. HUXLEY.

The same subject of experimental evolution reappears in a letter to Professor Romanes of April 29. A project was on foot for founding an institution in which experi-

ments bearing upon the Darwinian theory could be carried out. After congratulating Professor Romanes upon his recent election to the Athenæum Club, he proceeds:—

In a review of Darwin's *Origin* published in the *Westminster* for 1860 (*Lay Sermons*, pp. 323-24), you will see that I insisted on the logical incompleteness of the theory so long as it was not backed by experimental proof that the cause assumed was competent to produce all the effects required. See also *Lectures to Working Men*, 1863, pp. 146, 147.) In fact, Darwin used to reproach me sometimes for my pertinacious insistence on the need of experimental verification.

But I hope you are going to choose some other title than "Institut transformiste," which implies that the Institute is pledged to a foregone conclusion, that it is a workshop devoted to the production of a particular kind of article. Moreover, I should say that as a matter of prudence, you had better keep clear of the word "experimental." Would not "Biological Observatory" serve the turn? Of course it does not exclude experiment any more than "Astronomical Observatory" excludes spectrum analysis.

Please think over this. My objection to "Transformist" is very strong.

In August his youngest daughter wrote to him to find out the nature of various "objects of the sea-shore" which she had found on the beach in South Wales. His answers make one wish that there had been more questions.

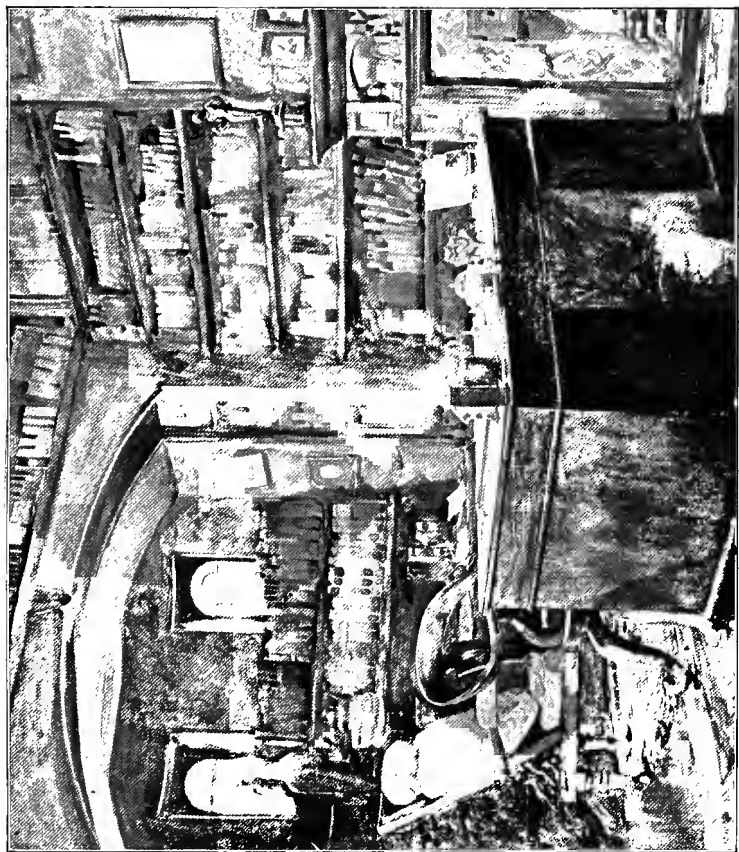
HODESLEA, EASTBOURNE, *Aug.* 14, 1891.

DEAREST BABS—1. "Ornary" or not "ornary" B is merely A turned upside down and viewed with the imperfect appreciation of the mere artistic eye!

2. Your little yellow things are, I expect, egg-cases of dog whelks. You will find a lot of small eggs inside them, one or two of which grow faster than the rest, and eat up their weaker brothers and sisters.

The dog whelk is common on the shores. If you look for something like this [sketch of a terrier coming out of a whelk shell], you will be sure to recognise it.

3. Starfish are *not* born in their proper shape and don't come from your whitish yellow lumps. The thing that comes out of a starfish egg is something like this [sketch], and swims



*From a Water-Colour by Reginald Barrett.*



about by its cilia. The starfish proper is formed inside, and it is carried on its back this-uns.

Finally starfish drops off carrying with it t'other one's stomach, so that the subsequent proceedings interest t'other one no more.

4. The ropy sand tubes that make a sort of banks and reefs are houses of worms, that they build up out of sand, shells, and slime. If you knock a lot to pieces you will find worms inside.

5. Now, how do I know what the rooks eat? But there are a lot of unconsidered trifles about, and if you get a good telescope and watch, you will have a glimpse as they hover between sand and rooks' beaks.

It has been blowing more or less of a gale here from the west for weeks—usually cold, often foggy—so that it seems as if summer were going to be late, probably about November.

But we thrive fairly well. L. and J. and their chicks are here and seem to stand the inclemency of the weather pretty fairly. The children are very entertaining.

M— has been a little complaining, but is as active as usual.

My love to Joyce, and tell her I am glad to hear she has not forgotten her astronomy.

In answer to your enquiry, Leonard says that Trevenen has twenty-five teeth. I have a sort of notion this can be hardly accurate, but never having been a mother can't presume to say.—Our best love to you all.—Ever your loving PATER.

HODESLEA, EASTBOURNE, Aug. 26, 1891.

DEAREST BABS—'Pears to me your friend is a squid or pen-and-ink fish. *Loligo* among the learned. Probably *Loligo media* which I have taken in that region. They have ten tentacles with suckers round their heads, two much longer than the others. They are close to cuttle-fish, but have a thin horny shell inside them instead of the "cuttle-bone." If you can get one by itself in a tub of water, it is pretty to see how they blush all over and go pale again, owing to little colour-bags in the skin, which expand and contract. Doubtless they took you for a heron, under the circumstances [sketch of a wader].

With slight intervals it has been blowing a gale from the west here for some months, the memory of man indeed goeth not back to the calm. I have not been really warm more than two days this so-called summer. And everybody prophesied we should be roasted alive here in summer.

We are all flourishing, and send our best love to Jack and you. Tell Joyce the wallflowers have grown quite high in her garden.—Ever your loving  
PATER.

Politics are not often touched upon in the letters of this period, but an extract from a letter of October 25, 1891, is of interest as giving his reason for supporting a Unionist Government, many of whose tendencies he was far from sympathising with—

The extract from the *Guardian* is wonderful. The Gladstonian tee-to-tum cannot have many more revolutions to make. The only thing left for him now, is to turn Agnostic, declare Homer to be an old bloke of a ballad-monger, and agitate for the prohibition of the study of Greek in all universities. . . .

It is just because I do not want to see our children involved in civil war that I postpone all political considerations to keeping up a Unionist Government.

I may be quite wrong; but right or wrong, it is no question of party. "Rads delight not me nor Tories neither," as Hamlet does not say.

The following letter to Sir M. Foster shows how little Huxley was now able to do in the way of public business without being knocked up:—

HODESLEA, Oct. 20, 1891.

MY DEAR FOSTER—If I had known the nature of the proceedings at the College of Physicians yesterday, I should have braved the tedium of listening to a lecture I could not hear in order to see you decorated. Clark had made a point of my going to the dinner,\* and, worse luck, I had to "say a few words" after it, with the result that I am entirely washed out to-day, and only able to send you the feeblest of congratulations.—Ever yours,  
T. H. HUXLEY.

The same thing appears in the following to Sir W. H. Flower, which is also interesting for his opinion on the question of promotion by seniority:—

HODESLEA, EASTBOURNE, Oct. 23, 1891.

MY DEAR FLOWER—My "next worst thing" was promoting a weak man to a place of responsibility in lieu of a strong one, on the mere ground of seniority.

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\* *i.e.* at the College of Physicians.

*Cæteris paribus*, or with even approximate equality of qualifications, no doubt seniority ought to count; but it is mere ruin to any service to let it interfere with the promotion of men of marked superiority, especially in the case of offices which involve much responsibility.

I suppose as trustee I may requisition a copy of Woodward's Catalogue. I should like to look a little more carefully at it. . . . We are none the worse for our pleasant glimpse of the world (and his wife) at your house; but I find that speechifying at public dinners is one of the luxuries that I must utterly deny myself. It will take me three weeks' quiet to get over my escape.—Ever yours very faithfully,

T. H. HUXLEY.

## CHAPTER XVIII

1892

THE revival of part of the former controversy which he had had with Mr. Gladstone upon the story of creation, made a warlike beginning of an otherwise very peaceful year. Since the middle of December a great correspondence had been going on in the *Times*, consequent upon the famous manifesto of the thirty-eight Anglican clergy touching the question of inspiration and the infallibility of the Bible. Criticism, whether "higher" or otherwise, defended on the one side, was unsparingly denounced on the other. After about a month of this correspondence, Huxley's name was mentioned as one of these critics; whereupon he was attacked by one of the disputants for "misleading the public" by his assertion in the original controversy that while reptiles appear in the geological record before birds, Genesis affirms the contrary; the critic declaring that the word for "creeping things" (*rehmes*) created on the sixth day, does not refer to reptiles, which are covered by the "moving creatures" (*shehretz*) used of the first appearance of animal life.

It is interesting to see how, in his reply, Huxley took care to keep the main points at issue separate from the subordinate and unimportant ones. His answer is broken up into four letters. The first (*Times*, January 26) rehearses the original issue between himself and Mr. Gladstone; wherein both sides agreed that the creation of the sixth day included reptiles, so that, formally at least, his position was secure, though there was also a broader ground of difference to be considered. Before proceeding further, he asks



his critic whether he admits the existence of the contradiction involved, and if not, to state his reasons therefor. These reasons were again given on February 1 as the new interpretation of the two Hebrew words already referred to, an interpretation, by the way, which makes the same word stand both for "the vast and various population of the waters" and "for such land animals as mice, weasels, and lizards, great and small."

On February 3 appeared the second letter, in which, setting aside the particular form which his argument against Mr. Gladstone had taken, he described the broad differences between the teachings of Genesis and the teachings of evolution. He left the minor details as to the interpretation of the words in dispute, which did not really affect the main argument, to be dealt with in the next letter of February 4. It was a question with which he had long been familiar, as twenty years before he had, at Dr. Kalisch's request, gone over the proofs of his *Commentary on Leviticus*.

The letter of February 3 is as follows:—

While desirous to waste neither your space nor my own time upon mere misrepresentations of what I have said elsewhere about the relations between modern science and the so-called "Mosaic" cosmogony, it seems needful that I should ask for the opportunity of stating the case once more, as briefly and fairly as I can.

I conceive the first chapter of Genesis to teach—(1) that the species of plants and animals owe their origin to supernatural acts of creation; (2) that these acts took place at such times and in such a manner that all the plants were created first, all the aquatic and aerial animals (notably birds) next, and all terrestrial animals last. I am not aware that any Hebrew scholar denies that these propositions agree with the natural sense of the text. Sixty years ago I was taught, as most people were then taught, that they are guaranteed by Divine authority.

On the other hand, in my judgment, natural science teaches no less distinctly—(1) that the species of animals and plants have originated by a process of natural evolution; (2) that this process has taken place in such a manner that the species of animals and plants, respectively, have come into existence one after another throughout the whole period since they began to exist on the earth; that the species of plants and animals known

to us are, as a whole, neither older nor younger the one than the other.

The same holds good of aquatic and aerial species, as a whole, compared with terrestrial species; but birds appear in the geological record later than terrestrial reptiles, and there is every reason to believe that they were evolved from the latter.

Until it is shown that the first two propositions are not contained in the first chapter of Genesis, and that the second pair are not justified by the present condition of our knowledge, I must continue to maintain that natural science and the "Mosaic" account of the origin of animals and plants are in irreconcilable antagonism.

As I greatly desire that this broad issue should not be obscured by the discussion of minor points, I propose to defer what I may have to say about the great "shehretz" and "rehmes" question till to-morrow.

On February 11 he wrote once more, again taking certain broader aspects of the problem presented by the first chapter of Genesis. He expressed his belief, as he had expressed it in 1869, that theism is not logically antagonistic to evolution. If, he continues, the account in Genesis, as Philo of Alexandria held, is only a poem or allegory, where is the proof that any one non-natural interpretation is the right one? and he concludes by pointing out the difficulties in the way of those who, like the famous thirty-eight, assert the infallibility of the Bible as guaranteed by the infallibility of the Church.

Apart from letters and occasional controversy, he published this year only one magazine article and a single volume of collected essays, though he was busy preparing the Romanes Lecture for 1893, the more so because there was some chance that Mr. Gladstone would be unable to deliver the first of the lectures in 1892, and Huxley had promised to be ready to take his place if necessary.

The volume (called *Controverted Questions*) which appeared in 1892, was a collection of the essays of the last few years, mainly controversial, or as he playfully called them, "endeavours to defend a cherished cause," dealing with agnosticism and the demonological and miraculous element in Christianity. That they were controversial in tone no one

lamented more than himself; and as in the letter to M. de Varigny, of November 25, 1891, so here in the prologue he apologises for the fact.

This prologue,—of which he writes to a friend, “It cost me more time and pains than any equal number of pages I have ever written,”—was designed to indicate the main question, various aspects of which are dealt with by these seemingly disconnected essays.

The historical evolution of humanity (he writes), which is generally, and I venture to think not unreasonably, regarded as progress, has been, and is being, accompanied by a co-ordinate elimination of the supernatural from its originally large occupation of men’s thought. The question—How far is this process to go? is, in my apprehension, the controverted question of our time.

This movement, marked by the claim for the freedom of private judgment, which first came to its fulness in the Renaissance, is here sketched out, rising or sinking by turns under the pressure of social and political vicissitudes, from Wiclif’s earliest proposal to reduce the Supernaturalism of Christianity within the limits sanctioned by the Scriptures, down to the manifesto in the previous year of the thirty-eight Anglican divines in defence of biblical infallibility, which practically ends in an appeal to the very principle they reject.

But he does not content himself with pointing out the destructive effects of criticism upon the evidence in favour of a “supernature”—“The present incarnation of the spirit of the Renaissance,” he writes, “differs from its predecessor in the eighteenth century, in that it builds up, as well as pulls down. That of which it has laid the foundation, of which it is already raising the superstructure, is the doctrine of evolution,” a doctrine that “is no speculation, but a generalisation of certain facts, which may be observed by any one who will take the necessary trouble.” And in a short dozen pages he sketches out that common body of established truths “to which it is his confident belief that ‘all future philosophical and theological speculations will have to accommodate themselves.’”

There is no need to recapitulate these; they may be read in *Science and Christian Tradition*, the fifth volume of the Collected Essays, but it is worth noticing that in conclusion, after rejecting "a great many supernaturalistic theories and legends which have no better foundations than those of heathenism," he declares himself as far from wishing to "throw the Bible aside as so much waste paper" as he was at the establishment of the School Board in 1870. As English literature, as world-old history, as moral teaching, as the *Magna Charta* of the poor and of the oppressed, the most democratic book in the world, he could not spare it. "I do not say," he adds, "that even the highest biblical ideal is exclusive of others or needs no supplement. But I do believe that the human race is not yet, possibly may never be, in a position to dispense with it."

It was this volume that led to the writing of the magazine article referred to above. The republication in it of the "Agnosticism," originally written in reply to an article of Mr. Frederic Harrison's, induced the latter to disclaim in the *Fortnightly Review* the intimate connection assumed to exist between his views and the system of Positivism detailed by Comte, and at the same time to offer the olive branch to his former opponent. But while gratefully accepting the goodwill implied in the offer, Huxley still declared himself unable to "give his assent to a single doctrine which is the peculiar property of Positivism, old or new," nor to agree with Mr. Harrison when he wanted

to persuade us that agnosticism is only the Court of the Gentiles of the Positivist temple; and that those who profess ignorance about the proper solution of certain speculative problems ought to call themselves Positivists of the Gate, if it happens that they also take a lively interest in social and political questions.

This essay, "An Apologetic Irenicon," contains more than one passage of personal interest, which are the more worth quoting here, as the essay has not been republished. It was to have been included in a tenth volume of collected Essays, along with a number of others which he projected, but never wrote.

Thus, begging the Positivists not to regard him as a rival or competitor in the business of instructing the human race, he says:—

I aspire to no such elevated and difficult situation. I declare myself not only undesirous of it, but deeply conscious of a constitutional unfitness for it. Age and hygienic necessities bind me to a somewhat anchoritic life in pure air, with abundant leisure to meditate upon the wisdom of *Candide's* sage aphorism, "Cultivons notre jardin"—especially if the term garden may be taken broadly and applied to the stony and weed-grown ground within my skull, as well as to a few perches of more promising chalk down outside it. In addition to these effectual bars to any of the ambitious pretensions ascribed to me, there is another: of all possible positions that of master of a school, or leader of a sect, or chief of a party, appears to me to be the most undesirable; in fact, the average British matron cannot look upon followers with a more evil eye than I do. Such acquaintance with the history of thought as I possess, has taught me to regard schools, parties, and sects, as arrangements, the usual effect of which is to perpetuate all that is worst and feeblest in the master's, leader's, or founder's work; or else, as in some cases, to upset it altogether; as a sort of hydrants for extinguishing the fire of genius, and for stifling the flame of high aspirations, the kindling of which has been the chief, perhaps the only, merit of the protagonist of the movement. I have always been, am, and propose to remain a mere scholar. All that I have ever proposed to myself is to say, this and this have I learned; thus and thus have I learned it: go thou and learn better; but do not thrust on my shoulders the responsibility for your own laziness if you elect to take, on my authority, conclusions, the value of which you ought to have tested for yourself.

Again, replying to the reproach that all his public utterances had been of a negative character, that the great problems of human life had been entirely left out of his purview, he defends once more the work of the man who clears the ground for the builders to come after him:—

There is endless backwoodsman's work yet to be done. If "those also serve who only stand and wait," still more do those who sweep and cleanse; and if any man elect to give his strength to the weeder's and scavenger's occupation, I remain of the opin-

ion that his service should be counted acceptable, and that no one has a right to ask more of him than faithful performance of the duties he has undertaken. I venture to count it an improbable suggestion that any such person—a man, let us say, who has well-nigh reached his threescore years and ten, and has graduated in all the faculties of human relationships; who has taken his share in all the deep joys and deeper anxieties which cling about them; who has felt the burden of young lives entrusted to his care, and has stood alone with his dead before the abyss of the eternal—has never had a thought beyond negative criticism. It seems to me incredible that such an one can have done his day's work, always with a light heart, with no sense of responsibility, no terror of that which may appear when the factitious veil of Isis—the thick web of fiction man has woven round nature—is stripped off.

Challenged to state his "mental bias, *pro* or *con*," with regard to such matters as Creation, Providence, etc., he reiterates his words written thirty-two years before:—

So far back as 1860 I wrote:—

"The doctrine of special creation owes its existence very largely to the supposed necessity of making science accord with the Hebrew cosmogony;" and that the hypothesis of special creation is, in my judgment, a "mere specious mask for our ignorance." Not content with negation, I said:—

"Harmonious order governing eternally continuous progress; the web and woof of matter and force interweaving by slow degrees, without a broken thread, that veil which lies between us and the infinite; that universe which alone we know, or can know; such is the picture which science draws of the world."

. . . Every reader of Goethe will know that the second is little more than a paraphrase of the well-known utterance of the "Zeitgeist" in *Faust*, which surely is something more than a mere negation of the clumsy anthropomorphism of special creation.

Follows a query about "Providence," my answer to which must depend upon what my questioner means by that substantive, whether alone, or qualified by the adjective "moral."

If the doctrine of a Providence is to be taken as the expression, in a way "to be understood of the people," of the total exclusion of chance from a place even in the most insignificant corner of Nature, if it means the strong conviction that the

cosmic process is rational, and the faith that, throughout all duration, unbroken order has reigned in the universe, I not only accept it, but I am disposed to think it the most important of all truths. As it is of more consequence for a citizen to know the law than to be personally acquainted with the features of those who will surely carry it into effect, so this very positive doctrine of Providence, in the sense defined, seems to me far more important than all the theorems of speculative theology. If, further, the doctrine is held to imply that, in some indefinitely remote past aeon, the cosmic process was set going by some entity possessed of intelligence and foresight, similar to our own in kind, however superior in degree, if, consequently, it is held that every event, not merely in our planetary speck, but in untold millions of other worlds, was foreknown before these worlds were, scientific thought, so far as I know anything about it, has nothing to say against that hypothesis. It is, in fact, an anthropomorphic rendering of the doctrine of evolution.

It may be so, but the evidence accessible to us is, to my mind, wholly insufficient to warrant either a positive or a negative conclusion.

He remarks in passing upon the entire exclusion of "special" providences by this conception of a universal "Providence." As for "moral" providence:—

So far as mankind has acquired the conviction that the observance of certain rules of conduct is essential to the maintenance of social existence, it may be proper to say that "Providence," operating through men, has generated morality. Within the limits of a fraction of a fraction of the living world, therefore, there is a "moral" providence. Through this small plot of an infinitesimal fragment of the universe there runs a "stream of tendency towards righteousness." But outside the very rudimentary germ of a garden of Eden, thus watered, I am unable to discover any "moral" purpose, or anything but a stream of purpose towards the consummation of the cosmic process, chiefly by means of the struggle for existence, which is no more righteous or unrighteous than the operation of any other mechanism.

This, of course, is the underlying principle of the Romanes Lecture, upon which he was still at work. It is more specifically expressed in the succeeding paragraph:—

I hear much of the "ethics of evolution." I apprehend that, in the broadest sense of the term "evolution," there neither is, nor can be, any such thing. The notion that the doctrine of evolution can furnish a foundation for morals seems to me to be an illusion which has arisen from the unfortunate ambiguity of the term "fittest" in the formula, "survival of the fittest." We commonly use "fittest" in a good sense, with an understood connotation of "best"; and "best" we are apt to take in its ethical sense. But the "fittest" which survives in the struggle for existence may be, and often is, the ethically worst.

Another paragraph explains the sense in which he used to say that the Romanes Lecture was a very orthodox discourse on the text, "Satan, the Prince of this world":—

It is the secret of the superiority of the best theological teachers to the majority of their opponents that they substantially recognise these realities of things, however strange the forms in which they clothe their conceptions. The doctrines of predestination, of original sin, of the innate depravity of man and the evil fate of the greater part of the race, of the primacy of Satan in this world, of the essential vileness of matter, of a malevolent Demiurgus subordinate to a benevolent Almighty, who has only lately revealed himself, faulty as they are, appear to me to be vastly nearer the truth than the "liberal" popular illusions that babies are all born good, and that the example of a corrupt society is responsible for their failure to remain so; that it is given to everybody to reach the ethical ideal if he will only try; that all partial evil is universal good, and other optimistic figments, such as that which represents "Providence" under the guise of a paternal philanthropist, and bids us believe that everything will come right (according to our notions) at last.

As to "Immortality" again [he refers his critic to his book on "Hume"] I do not think I need return to "subjective" immortality, but it may be well to add that I am a very strong believer in the punishment of certain kinds of actions, not only in the present, but in all the future a man can have, be it long or short. Therefore in hell, for I suppose that all men with a clear sense of right and wrong (and I am not sure that any others deserve such punishment) have now and then "descended into hell" and stopped there quite long enough to know what infinite punishment means. And if a genuine, not merely subjective, immortality awaits us, I conceive that, without some



such change as that depicted in the fifteenth chapter of the first Epistle to the Corinthians, immortality must be eternal misery. The fate of Swift's *Struldbrugs* seems to me not more horrible than that of a mind imprisoned for ever within the *flammanitia mania* of inextinguishable memories.

Further, it may be well to remember that the highest level of moral aspiration recorded in history was reached by a few ancient Jews—Micah, Isaiah, and the rest—who took no count whatever of what might or might not happen to them after death. It is not obvious to me why the same point should not by and by be reached by the Gentiles.

He admits that the generality of mankind will not be satisfied to be told that there are some topics about which we know nothing now, and do not seem likely ever to be able to know more; and, consequently, that in the long-run the world will turn to those who profess to have conclusions:—

And that is the pity of it. As in the past, so, I fear, through a very long future, the multitude will continue to turn to those who are ready to feed it with the viands its soul lusteth after; who will offer mental peace where there is no peace, and lap it in the luxury of pleasant delusions.

To missionaries of the Neo-Positivist, as to those of other professed solutions of insoluble mysteries, whose souls are bound up in the success of their sectarian propaganda, no doubt, it must be very disheartening if the "world," for whose assent and approbation they sue, stops its ears and turns its back upon them. But what does it signify to any one who does not happen to be a missionary of any sect, philosophical or religious, and who, if he were, would have no sermon to preach except from the text with which Descartes, to go no further back, furnished us two centuries since? I am very sorry if people will not listen to those who rehearse before them the best lessons they have been able to learn, but that is their business, not mine. Belief in majorities is not rooted in my breast, and if all the world were against me the fact might warn me to revise and criticise my opinions, but would not in itself supply a ghost of a reason for forsaking them. For myself I say deliberately, it is better to have a millstone tied round the neck and be thrown into the sea than to share the enterprises of those to whom the world has turned, and will turn, because they minister to its weaknesses and cover up the awful realities which it shudders to look at.

A letter to Mr. W. P. Clayton also discusses the basis of morality.

HODESIEA, EASTBOURNE, Nov. 5, 1892.

DEAR SIR—I well remember the interview to which you refer, and I should have replied to your letter sooner, but during the last few weeks I have been very busy.

Moral duty consists in the observance of those rules of conduct which contribute to the welfare of society, and by implication, of the individuals who compose it.

The end of society is peace and mutual protection, so that the individual may reach the fullest and highest life attainable by man. The rules of conduct by which this end is to be attained are discoverable—like the other so-called laws of Nature—by observation and experiment, and only in that way.

Some thousands of years of such experience have led to the generalisations, that stealing and murder, for example, are inconsistent with the ends of society. There is no more doubt that they are so than that unsupported stones tend to fall. The man who steals or murders, breaks his implied contract with society, and forfeits all protection. He becomes an outlaw, to be dealt with as any other feral creature. Criminal law indicates the ways which have proved most convenient for dealing with him.

All this would be true if men had no "moral sense" at all, just as there are rules of perspective which must be strictly observed by a draughtsman, and are quite independent of his having any artistic sense.

The moral sense is a very complex affair—dependent in part upon associations of pleasure and pain, approbation and disapprobation formed by education in early youth, but in part also on an innate sense of moral beauty and ugliness (how originated need not be discussed), which is possessed by some people in great strength, while some are totally devoid of it—just as some children draw, or are enchanted by music while mere infants, while others do not know "Cherry Ripe" from "Rule Britannia," nor can represent the form of the simplest thing to the end of their lives.

Now for this last sort of people there is no reason why they should discharge any moral duty, except from fear of punishment in all its grades, from mere disapprobation to hanging, and the duty of society is to see that they live under wholesome fear of such punishment short, sharp, and decisive.

For the people with a keen innate sense of moral beauty

there is no need of any other motive. What they want is knowledge of the things they may do and must leave undone, if the welfare of society is to be attained. Good people so often forget this that some of them occasionally require hanging almost as much as the bad.

If you ask why the moral inner sense is to be (under due limitations) obeyed; why the few who are steered by it move the mass in whom it is weak? I can only reply by putting another question—Why do the few in whom the sense of beauty is strong—Shakespeare, Raffaele, Beethoven, carry the less endowed multitude away? But they do, and always will. People who overlook that fact attend neither to history nor to what goes on about them.

Benjamin Franklin was a shrewd, excellent, kindly man. I have a great respect for him. The force of genial common-sense respectability could no further go. George Fox was the very antipodes of all this, and yet one understands how he came to move the world of his day, and Franklin did not.

As to whether we can all fulfil the moral law, I should say, hardly any of us. Some of us are utterly incapable of fulfilling its plainest dictates. As there are men born physically cripples and intellectually idiots, so there are some who are moral cripples and idiots, and can be kept straight not even by punishment. For these people there is nothing but shutting up, or extirpation.—I am, yours faithfully, T. H. HUXLEY.

The peaceful aspect of this article seems to have veiled to most readers the unbroken nature of his defence, and he writes to his son-in-law, the Hon. John Collier, suggesting an alteration in the title of the essay:—

HODESLEA, EASTBOURNE, *Nov.* 8, 1892.

MY DEAR JACK—It is delightful to find a reader who “twigs” every point as acutely as your brother has done. I told somebody—was it you?—I rather wished the printer would substitute *o* for *e* in *Irenicon*. So far as I have seen any notices, the British critic (what a dull ass he is) appears to have been seriously struck by my sweetness of temper.

I sent you the article yesterday, so you will judge for yourself.—With love, ever yours affectionately,

T. H. HUXLEY.

You should see the place I am claiming for Art in the University. I do believe something will grow out of my plan, which

has made all the dry bones rattle. It is coming on for discussion in the Senate, and I shall be coming to you to have my wounds dressed after the fight. Don't know the day yet.

This allusion to the place of Art in the University refers to the proposed reorganisation of the London University.

Since the year 1887 the question of establishing a Teaching University for London had become more and more pressing. London contained many isolated teaching bodies of various kinds—University College, King's College, the Royal College of Science, the Medical Schools, Bedford College, and so forth, while the London University was only an examining body. Clearly these scattered bodies needed organising; the educational forces of the metropolis were disintegrated; much teaching—and this was especially true of the medical schools—that could have been better done and better paid in a single institution, was split up among several, none of which, perhaps, could offer sufficient inducement to keep the best men permanently.

The most burning question was, whether these bodies should be united into a new university, with power to grant degrees of its own, or should combine with the existing University of London, so that the latter would become a teaching as well as an examining body. And if so, there was the additional question as to the form which this combination should take—whether federation, for example, or absorption.

The whole question had been referred to a Royal Commission by the Government of Lord Salisbury. The results were seen in the charter for a Gresham University, embodying the former alternative, and in the introduction into Parliament of a Bill to carry this scheme into effect. But this action had only been promoted by some of the bodies interested, and was strongly opposed by other bodies, as well as by many teachers who were interested in university reform.

Thus at the end of February, Huxley was invited, as a Governor of University College, to sign a protest against the provisions of the Charter for a Teaching University then before Parliament, especially in so far as it was proposed

to establish a second examining body in London. The signatories also begged the Government to grant further enquiry before legislating on the subject.

The protest, which received over 100 signatures of weight, contributed something towards the rejection of the Bill in the House of Commons. It became possible to hope that there might be established in London a University which should be something more than a mere collection of teachers, having as their only bond of union the preparation of students for a common examination. It was proposed to form an association to assist in the promotion of a teaching university for the metropolis; but the first draft of a scheme to reconcile the complication of interests and ideals involved led Huxley to express himself as follows:—

HODESLEA, EASTBOURNE, *March 27, 1892.*

DEAR PROFESSOR WELDON \*—I am sorry to have kept you waiting so long for an answer to your letter of the 17th: but your proposal required a good deal of consideration, and I have had a variety of distractions.

So long as I am a member of the Senate of the University of London, I do not think I can with propriety join any Association which proposes to meddle with it. Moreover, though I have a good deal of sympathy with the ends of the Association, I have my doubts about many propositions set forth in your draft.

I took part in the discussions preliminary to Lord Justice Fry's scheme, and I was so convinced that that scheme would be wrecked amidst the complication of interests and ideals that claimed consideration, that I gave up attending to it. In fact, living so much out of the world now, and being sadly deaf, I am really unfit to intervene in business of this kind.

Worse still, I am conscious that my own ideal is, for the present at any rate, hopelessly impracticable. I should cut away medicine, law, and theology as technical specialities in charge of corporations which might be left to settle (in the case of medicine, in accordance with the State) the terms on which they grant degrees.

The university or universities should be learning and teach-

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\* Then at University College, London; now Linacre Professor of Physiology at Oxford.

ing bodies devoted to art (literary and other), history, philosophy, and science, where any one who wanted to learn all that is known about these matters should find people who could teach him and put him in the way of learning for himself.

That is what the world will want one day or other, as a supplement to all manner of high schools and technical institutions in which young people get decently educated and learn to earn their bread—such as our present universities.

It will be a place for men to get knowledge; and not for boys and adolescents to get degrees.

I wish I could get the younger men like yourself to see that this is the goal which they may reach, and in the meanwhile to take care that no such Philistine compromise as is possible at present, becomes too strong to survive a sharp shake.—I am,  
yours very faithfully,  
T. H. HUXLEY.

He sketches his ideal of a modern university, and especially of its relation to the Medical Schools, in a letter to Professor Ray Lankester of April 11:—

HODESLEA, EASTBOURNE, *April 11, 1892.*

MY DEAR LANKESTER—We have been having ten days of sunshine, and I have been correspondingly lazy, especially about letter-writing. This, however, is my notion; that unless people clearly understand that the university of the future is to be a very different thing from the university of the past, they had better put off meddling for another generation.

The mediæval university looked backwards: it professed to be a storehouse of old knowledge, and except in the way of dialectic cobweb-spinning, its professors had nothing to do with novelties. Of the historical and physical (natural) sciences, of criticism and laboratory practice, it knew nothing. Oral teaching was of supreme importance on account of the cost and rarity of manuscripts.

The modern university looks forward, and is a factory of new knowledge: its professors have to be at the top of the wave of progress. Research and criticism must be the breath of their nostrils; laboratory work the main business of the scientific student; books his main helpers.

The lecture, however, in the hands of an able man will still have the utmost importance in stimulating and giving facts and principles their proper relative prominence.

I think we should get pretty nearly what is wanted by graft-

ing a Collège de France on to the University of London, subsidising University College and King's College (if it will get rid of its tests, not otherwise), and setting up two or three more such bodies in other parts of London. (Scotland, with a smaller population than London, has four complete universities!)

I should hand over the whole business of medical education and graduation to a medical universitas to be constituted by the royal colleges and medical schools, whose doings, of course, would be checked by the Medical Council.

Our side has been too apt to look upon medical schools as feeders for Science. They have been so, but to their detriment as medical schools. And now that so many opportunities for purely scientific training are afforded, there is no reason they should remain so.

The problem of the Medical University is to make an average man into a good practical doctor before he is twenty-two, and with not more expense than can be afforded by the class from which doctors are recruited, or than will be rewarded by the prospect of an income of £400 to £500 a year.

It is not right to sacrifice such men, and the public on whom they practise, for the prospect of making 1 per cent of medical students into men of science.—Ever yours very faithfully,

T. H. HUXLEY.

An undated draft in his own handwriting (probably the draft of a speech delivered the first time he came to the committee as President, October 26) expands the same idea as to the modern requirements of the University:—

The cardinal fact in the University question appears to me to be this: that the student to whose wants the mediæval University was adjusted, looked to the past and sought book-learning, while the modern looks to the future and seeks the knowledge of things.

The mediæval view was that all knowledge worth having was explicitly or implicitly contained in various ancient writings; in the Scriptures, in the writings of the greater Greeks, and those of the Christian Fathers. Whatever apparent novelty they put forward, was professedly obtained by deduction from ancient data.

The modern knows that the only source of real knowledge lies in the application of scientific methods of inquiry to the ascertainment of the facts of existence; that the ascertainable

is infinitely greater than the ascertained, and that the chief business of the teacher is not so much to make scholars as to train pioneers.

From this point of view, the University occupies a position altogether independent of that of the coping-stone of schools for general education, combined with technical schools of Theology, Law, and Medicine. It is not primarily an institution for testing the work of schoolmasters, or for ascertaining the fitness of young men to be curates, lawyers, or doctors.

It is an institution in which a man who claims to devote himself to Science or Art, should be able to find some one who can teach him what is already known, and train him in the methods of knowing more.

I include under Art,—Literature, the pictorial and plastic art with Architecture, and Music; and under Science,—Logic, Philosophy, Philology, Mathematics, and the Physical Sciences.

The question of the connection of the High Schools for general education, and of the technical schools of Theology, Law, Medicine, Engineering, Art, Music, and so on, with the University is a matter of practical detail. Probably the teaching of the subjects which stand in the relation of preliminaries to technical teaching and final studies in higher general education in the University would be utilised by the colleges and technical schools.

All that I have to say on this subject is, that I see no reason why the existing University of London should not be completed in the sense I have defined by grafting upon it a professoriate with the appropriate means and appliances, which would supply London with the analogue of the *École des hautes Études* and the *Collège de France* in Paris, and of the Laboratories with the Professor *Extraordinarius* and *Privat Docenten* in the German Universities.

A new Commission was promised to look into the whole question of the London University. This is referred to in a letter to Sir J. Donnelly of March 30, 1892:—

Unless you want to kill Foster, don't suggest him for the Commission. He is on one already.

The whole affair is a perfect muddle of competing crude projects and vested interests, and is likely to end in a worse muddle, as anything but a patch up is, I believe, outside practical politics at present.

If I had *carte blanche*, I should cut away the technical



“ Faculties ” of Medicine, Law, and Theology, and set up first-class chairs in Literature, Art, Philosophy, and pure Science—a sort of combination of Sorbonne (without Theology) and Collège de France.

Thank Heaven I have never been asked to say anything, and my chimæras remain *in petto*. They would be scouted.

On the other hand, he was most anxious to keep the School of Science at South Kensington entirely independent. He writes again on May 26:—

I trust Rücker and Thorpe are convinced by this time that I knew what I was talking about when I told them, months ago, that there would be an effort to hook us into the new University hotch-potch.

I am ready to oppose any such project tooth and nail. I have not been striving these thirty years to get Science clear of their schoolmastering sham-literary peddling to give up the game without a fight. I hope my Lords will be staunch.

I am glad my opinion is already on record.

And similarly to Sir M. Foster on October 30:—

You will have to come to London and set up physiology at the Royal College of Science. It is the only place in Great Britain in which scientific teaching is trammelled neither by parsons nor by littérateurs. I have always implored Donnelly to keep us clear of any connection with a University of any kind, sort, or description, and I tried to instil the same lesson into the doctors the other day. But the “ liberal education ” cant is an obsession of too many of them.

A further step was taken in June, when he was sent a new draft of proposals, afterwards adopted by the above-mentioned general meeting of the Association in March, 1893, sketching a constitution for a new university, and asking for the appointment of a Statutory Commission to carry it out. The University thus constituted was to be governed by a Court, half of which should consist of university professors\* ; it was to include such faculties as

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\* “ As for a government by professors only ” (he writes in the *Times* of Dec. 6, 1892), “ the fact of their being specialists is against them. Most of them are broad-minded, practical men ; some are good administrators. But, unfortunately, there is among them, as in other

Law, Engineering, Medicine, while it was to bring into connection the various teaching bodies scattered over London. The proposers themselves recognised that the scheme was not ideal, but a compromise which at least would not hamper further progress, and would supersede the Gresham scheme, which they regarded as a barrier to all future academic reform.

The Association as thus constituted Huxley now joined, and was immediately asked to accept the Presidency, not that he should do any more militant work than he was disposed to attempt, but simply that he should sit like Moltke in his tent and keep an eye on the campaign.

He felt it almost a point of honour not to refuse his best services to a cause he had always had at heart, though he wrote:—

There are some points in which I go further than your proposals, but they are so much, to my mind, in the right direction that I gladly support them.

And again:—

The Association scheme is undoubtedly a compromise—but it is a compromise which takes us the right way, while the former schemes led nowhere except to chaos.

He writes to Sir W. H. Flower:—

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professions, a fair sprinkling of one-idea'd fanatics, ignorant of the commonest conventions of official relation, and content with nothing if they cannot get everything their own way. It is these persons who, with the very highest and purest intentions, would ruin any administrative body unless they were counterpoised by non-professional, common-sense members of recognised weight and authority in the conduct of affairs." Furthermore, against the adoption of a German university system, he continues, "In holding up the University of Berlin as our model, I think you fail to attach sufficient weight to the considerations that there is no Minister of Public Instruction in these realms; that a great many of us would rather have no university at all than one under the control of such a minister, and whose highest representatives might come to be, not the fittest men, but those who stood foremost in the good graces of the powers that be, whether Demos, Ministry, or Sovereign."

HODESLEA, EASTBOURNE, *June 27, 1892.*

MY DEAR FLOWER—I had quite given up the hope that anything but some wretched compromise would come of the University Commission, when I found, to my surprise, no less than gratification, that a strong party among the younger men were vigorously taking the matter up in the right (that is, *my*) sense.

In spite of all my good resolves to be a "hermit old in mossy cell," I have enlisted—for ambulance service if nothing better.

The move is too important to spare oneself if one can be of any good.—Ever yours very faithfully, T. H. HUXLEY.

Of his work in this position Professor Karl Pearson says, in a letter to me:—

Professor Huxley gallantly came to lead a somewhat forlorn hope,—that of establishing a really great university in London. He worked, as may naturally be supposed, with energy and persistence, and one, who like myself was not in full sympathy with the lines he took, can but admire the vigour he threw into the movement. Nothing came of it practically; . . . but Professor Huxley's leadership did, at any rate, a great deal to unite the London teachers, and raise their ideal of a true university, while at the same time helping to repress the self-interests of many persons and institutions which had been before very much to the front.

Clearly this is the sort of thing referred to in a letter of December 20:—

Got through the Association business very well, but had to show that I am the kind of head that does not lend itself to wagging by the tail.

The Senate of the University of London showed practical unanimity in accepting the idea of taking on teaching functions if the Commission should think it desirable, though the Medical Schools were still desirous of getting their degree granted on the mere license examination of the Royal Colleges, without any evidence of general culture or academical training, and on July 28 Huxley writes:—

The decision of the representatives of the Medical Schools is just such as I should have expected. I always told my colleagues in the Senate of the University of London that such

was their view, and that, in the words of Pears' advertisement, they "would not be happy till they got it."

And they won't get it unless the medical examining bodies are connected into a distinct degree-giving body.

In the course of the autumn matters seemed to be progressing. He writes to Sir M. Foster, November 9:—

I am delighted to say that Paget has taken up the game, and I am going to a committee of the University this day week to try my powers of persuasion. If the Senate can only be got to see where salvation lies and strike hard without any fooling over details, we shall do a great stroke of business for the future generations of Londoners.

And by the end of the year he writes:—

I think we are going to get something done, as the Senate of the U.L. has come into line with us, and I hope University College will do the same.

Meanwhile he was asked if he would appear before the Commission and give evidence—to "talk without interrogation" so as to convince the Commission of the inadequacy of the teaching of science in general and of the absence of means and appliances for the higher teaching. This he did early in January 1893, representing partly his own views, partly those of the Association, to whom he read what he proposed to say, before being authorised to speak on their behalf.

His position is finally defined by the following letter:—

*Feb. 9, 1893.*

DEAR PROFESSOR WELDON—I wish anything I have said or shall say about the organisation of the new University to be taken in connection with the following postulates which I conceive to be of primary importance:

1. The New University is not to be a separate body from the present University of London.
2. All persons giving academic instruction of a certain rank are to be "University Professors."
3. The Senate is to contain a large proportion of representatives of the "University Professors" with a limited term of office (say five years).

4. The University chest is to receive all fees and other funds for University purposes; and the Professors are to be paid out of it, according to work done for the University—thus putting an end to the present commercial competition of teaching institutions.

5. In all questions of Teaching, Examination, and Discipline the authority of the Senate is to be supreme—(saving appeal to the Privy Council).

Your questions will be readily answered if these postulates are kept in view.

In the case you put, the temptation to rivalry would not exist; and I should imagine that the Senate would refuse funds for the purpose of duplicating an existing Institution, unless very strong grounds for so doing could be shown. In short, they would adopt the plan which commends itself to you.

That to which I am utterly opposed is the creation of an Established Church Scientific, with a hierarchical organisation and a professorial Episcopate. I am fully agreed with you that all trading competition between different teaching institutions is a thing to be abolished (see No. 4 above).

On the other hand, intellectual competition is a very good thing, and perfect freedom of learning and teaching the best of all things.

If you put a physical, chemical, or biological bishop at the head of the teachers of those sciences in London, you will do your best to destroy that freedom. My bar to any catastrophe of that sort lies in No. 3. Let us take the case of Biology. I suppose there will be, at least, half a dozen Professoriates in different branches of this subject; each Professor will be giving the same amount of time and energy to University work, and will deserve the same pay. Each, if he is worth his salt, will be a man holding his own views on general questions, and having as good a right as any other to be heard. Why is one to be given a higher rank and vastly greater practical influence than all the rest? Why should not each be a "University Professor" and have his turn on the Senate in influencing the general policy of the University? The nature of things drives men more and more into the position of specialists. Why should one specialist represent a whole branch of science better than another, in Council or in Administration?

I am afraid we cannot build upon the analogy of Cambridge. In the first place London is not Cambridge; and, in the second, Michael Fosters do not grow on every bush.

The besetting sin of able men is impatience of contradiction and of criticism. Even those who do their best to resist the temptation, yield to it almost unconsciously and become the tools of toadies and flatterers. "Authorities," "disciples," and "schools" are the curse of science; and do more to interfere with the work of the scientific spirit than all its enemies.

Thus you will understand why I have so strongly opposed "absorption." No one can feel more strongly than I the need of getting the present chaos into order and putting an end to the absurd waste of money and energy. But I believe that end may be attained by the method of unification which I have suggested; without bringing in its train the evils which will inevitably flow from "absorptive" regimentation.

What I want to see is such an organisation of the means and appliances of University instruction in all its branches, as will conduce to the largest possible freedom of research, learning, and teaching. And if anybody will show me a better way to that end than through the measures I have suggested, I will gladly leave all and follow him.—I am yours very faithfully,

T. H. HUXLEY.

*P.S.*—Will you be so kind as to let Professor Lankester see this letter, as I am writing to him and shirk the labour of going over the whole ground again.

His last public activity, indeed, was on behalf of University reform, when in January 1895 he represented not only the Association, but, in the enforced absence of Sir James Paget, the Senate of the University also, on a deputation to Lord Rosebery, then Prime Minister, to whom he wrote asking if he were willing to receive such a deputation.

HODESLEA, EASTBOURNE, *Dec.* 4, 1894.

DEAR LORD ROSEBERY—A number of scientific people, in fact I think I may say all the leading men of science, and especially teachers in the country, are very anxious to see the University of London reorganised upon the general principles set forth in the Report of the last Royal Commission.

To this end nothing is wanted but the institution of a strong Statutory Commission; and we have all been hoping that a Bill would be introduced for that purpose.

It is rumoured that there are lions in the path. But even lions are occasionally induced to retreat by the sight of a large

body of beaters. And some of us think that such a deputation as would willingly wait on you, might hasten the desired movement.

We proposed something of the kind to Mr. Acland months ago, but nothing has come of the suggestion—not, I am sure, from any want of good will to our cause on his part.

Within the last few days I have been so strongly urged to bring the matter before you, that in spite of some doubts as to the propriety of going beyond my immediate chief the V.P. even in my private capacity I venture to make this appeal.—I am, dear Lord Rosebery, faithfully yours,

THOS. H. HUXLEY.

## CHAPTER XIX

1892

SEVERAL letters of this year touch on educational subjects. The following advice as to the best training for a boy in science, was addressed to Mr. Briton Riviere, R.A. :—

HODESLEA, *June 19, 1892.*

MY DEAR RIVIERE—Touching the training of your boy who wants to go in for science, I expect you will have to make a compromise between that which is theoretically desirable and that which is practically most advantageous, things being as they are.

Though I say it that shouldn't, I don't believe there is so good a training in physical science to be got anywhere as in our College at South Kensington. But Bernard could hardly with advantage take this up until he is seventeen at least. What he would profit by most as a preliminary, is training in the habit of expressing himself well and clearly in English; training in mathematics and the elements of physical science; in French and German, so as to read those languages easily—especially German; in drawing—not for hifalutin art, of which he will probably have enough in the blood—but accurate dry reproduction of form—one of the best disciplines of the powers of observation extant.

On the other hand, in the way of practical advantage in any career, there is a great deal to be said for sending a clever boy to Oxford or Cambridge. There are not only the exhibitions and scholarships, but there is the rubbing shoulders with the coming generation which puts a man in touch with his contemporaries as hardly anything else can do. A very good scientific education is to be had at both Cambridge and Oxford, especially Cambridge now.

In the case of sending to the university, putting through



the Latin and Greek mill will be indispensable. And if he is not going to make the classics a serious study, there will be a serious waste of time and energy.

So much in all these matters depends on the  $x$  contained in the boy himself. If he has the physical and mental energy to make a mark in science, I should drive him straight at science, taking care that he got a literary training through English, French, and German. An average capacity, on the other hand, may be immensely helped by university means of flotation.

But who in the world is to say how the  $x$  will turn out, before the real strain begins? One might as well prophesy the effect of a glass of "hot-with" when the relative quantities of brandy, water, and sugar are unknown. I am sure the large quantity of brandy and the very small quantity of sugar in my composition were suspected neither by myself, nor any one else, until the rows into which wicked men persisted in involving me began!

And that reminds me that I forgot to tell the publishers to send you a copy of my last peace-offering, and that one will be sent you by to-morrow's post. There is nothing new except the prologue, the sweet reasonableness of which will, I hope, meet your approbation.

It is not my fault if you have had to toil through this frightfully long screed; Mrs. Riviere, to whom our love, said you wanted it. "Tu l'as voulu, Georges Dandin."—Ever yours very faithfully,  
T. H. HUXLEY.

The following deals with State intervention in intermediate education:—

(For Sunday morning's leisure, or take it to church and read it in your hat.)

HODESLEA, EASTBOURNE, Oct. 1, 1892.

MY DEAR DONNELLY—Best thanks for sending on my letter. I do not suppose it will do much good, but, at any rate, I thought I ought to try to prevent their making a mess of medical education.

I like what I have seen of Acland. He seemed to have both intelligence and volition.

As to intermediate education I have never favoured the notion of State intervention in this direction.

I think there are only two valid grounds for State meddling with education: the one the danger to the community which

arises from dense ignorance; the other, the advantage to the community of giving capable men the chance of utilising their capacity.

The first furnishes the justification for compulsory elementary education. If a child is taught reading, writing, drawing, and handiwork of some kind; the elements of mathematics, physics, and history, and I should add of political economy and geography; books will furnish him with everything he can possibly need to make him a competent citizen in any rank of life.

If with such a start, he has not the capacity to get all he needs out of books, let him stop where he is. Blow him up with intermediate education as much as you like, you will only do the fellow a mischief and lift him into a place for which he has no real qualification. People never will recollect, that mere learning and mere cleverness are of next to no value in life, while energy and intellectual grip, the things that are inborn and cannot be taught, are everything.

The technical education act goes a long way to meet the second claim of the State; so far as scientific and industrial capacities are concerned. In a few years there will be no reason why any potential Whitworth or Faraday, in the three kingdoms, should not readily obtain the best education that is to be had, scientific or technical. The same will hold good for Art. So the question that arises seems to me to be whether the State ought or ought not to do something of the same kind for Literature, Philosophy, History, and Philology.

I am inclined to think not, on the ground that the universities and public schools ought to do this very work, and that as soon as they cease to be clericalised seminaries they probably will do it.

If the present government would only give up their Irish fad—and bring in a bill to make it penal for any parson to hold any office in a public school or university or to presume to teach outside the pulpit—they should have my valuable support!

I should not wonder if Gladstone's mind is open on the subject. Pity I am not sufficiently a *persona grata* with him to offer to go to Hawarden and discuss it.

I quite agree with you, therefore, that it will play the deuce if intermediate education is fossilised as it would be by any Act prepared under present influences. The most I should like to see done, would be to help the youth of special literary, linguistic and so forth, capacity, to get the best training in their special line.

It was lucky we did not go to you. My wife got an awful dose of neuralgia and general upset, and was laid up at the Hotel. The house was not quite finished inside, but we came in on Tuesday, and she has been getting better ever since in spite of the gale.

I am sorry to hear of the recurrence of influenza. It is a beastly thing. Lord Justice Bowen told me he has had it every time it has been in the country. You must come and try Eastbourne air as soon as we are settled. With our love to you and Mrs. Donnelly—Ever yours,  
T. H. HUXLEY.

Better be careful, I return all letters on which R.H. is not in full.

The next is to a young man with aspirations after an intellectual career, who asked his advice as to the propriety of throwing up his business, and plunging into literature or science:—

HODESLEA, EASTBOURNE, *Nov.* 5, 1892.

DEAR SIR—I am very sorry that the pressure of other occupations has prevented me from sending an earlier reply to your letter.

In my opinion a man's first duty is to find a way of supporting himself, thereby relieving other people of the necessity of supporting him. Moreover, the learning to do work of practical value in the world, in an exact and careful manner, is of itself a very important education, the effects of which make themselves felt in all other pursuits. The habit of doing that which you do not care about when you would much rather be doing something else, is invaluable. It would have saved me a frightful waste of time if I had ever had it drilled into me in youth.

Success in any scientific career requires an unusual equipment of capacity, industry, and energy. If you possess that equipment you will find leisure enough after your daily commercial work is over, to make an opening in the scientific ranks for yourself. If you do not, you had better stick to commerce. Nothing is less to be desired than the fate of a young man, who, as the Scotch proverb says, in "trying to make a spoon spoils a horn," and becomes a mere hanger-on in literature or in science, when he might have been a useful and a valuable member of Society in other occupations.

I think that your father ought to see this letter.—Yours faithfully,  
T. H. HUXLEY.

The last of the series, addressed to the secretary of a free-thought association, expresses his firmly rooted disgust at the use of mere ribaldry in attacking the theological husks which enclose a religious ideal.

*May 22, 1892.*

DEAR SIR—I regret that I am unable to comply with the wish of your committee. For one thing, I am engaged in work which I do not care to interrupt, and for another, I always make it a rule in these matters to “fight for my own hand.” I do not desire that anyone should share my responsibility for what I think fit to say, and I do not wish to be responsible for the opinions and modes of expression of other persons.

I do not say this with any reference to Mr. —, who is a sober and careful writer. But both as a matter of principle and one of policy, I strongly demur to a great deal of what appears as “free thought” literature, and I object to be in any way connected with it. Heterodox ribaldry disgusts me, I confess, rather more than orthodox fanaticism. It is at once so easy; so stupid; such a complete anachronism in England, and so thoroughly calculated to disgust and repel the very thoughtful and serious people whom it ought to be the great aim to attract. Old Noll knew what he was about when he said that it was of no use to try to fight the gentlemen of England with tapsters and serving-men. It is quite as hopeless to fight Christianity with scurrility. We want a regiment of Ironsides.

This summer brought Huxley a most unexpected distinction in the shape of admission to the Privy Council. Mention has already been made (Vol. I. p. 386) of his reasons for refusing to accept a title for distinction in science, apart from departmental administration. The proper recognition of science, he maintained, lay in the professional recognition of a man’s work by his peers in science, the members of the learned societies of his own and other countries.

But, as has been said, the Privy Councillorship was an office, not a title, although with a title attaching to the office; and in theory, at least, a scientific Privy Councillor might some day play an important part as an accredited representative of science, to be consulted officially by the Government, should occasion arise.

Of a selection of letters on the subject, mostly answers

to congratulations, I place first the one to Sir M. Foster, which gives the fullest account of the affair.

CON-Y-GEDAL HOTEL, BARMOUTH, *Aug. 23, 1892.*

MY DEAR FOSTER—I am very glad you think I have done rightly about the P.C.; but in fact I could hardly help myself.

Years and years ago I was talking to Donnelly about these things, and told him that so far as myself was concerned, I would have nothing to do with official decorations—didn't object to other people having them, especially heads of offices, like Hooker and Flower—but preferred to keep clear myself. But I added that there was one thing I did not mind telling him, because no English Government would ever act upon my opinion—and that was that the P.C. was a fit and proper recognition for science and letters. I have no doubt that he has kept this in mind ever since—in fact Lord Salisbury's letter (which was very handsome) showed he had been told of my *obiter dictum*. Donnelly was the first channel of inquiry whether I would accept, and was very strong that I should.

So you see if I had wished to refuse it, it would have been difficult and ungracious. But, on the whole, I thought the precedent good. Playfair tells me he tried to get it done in the case of Faraday and Babbage thirty years ago, and the thing broke down. Moreover a wicked sense of the comedy of advancing such a pernicious heretic, helped a good deal.

The worst of it is, I have just had a summons to go to Osborne on Thursday and it is as much as I shall be able to do.

We have been in South Wales, in the neighbourhood of the Colliers, and are on our way to the Wallers for the Festival week at Gloucester. We hope to get back to Eastbourne in the latter half of September and find the house clean swept and garnished. After that, by the way, it is *not* nice to say that we shall hope to have a visit from Mrs. Foster and you.

With our love to you both—Ever yours,

T. H. HUXLEY.

I am glad you are resting, but oh, why another Congress!

HODESLEA, EASTBOURNE, *June 21, 1892.*

MY DEAR DONNELLY—You have been and done me at last, you betrayer of confidence. This is what comes of confiding one's pet weakness to a bosom-friend!

But I can't deny my own words, or the accuracy of your

devil of a memory—and, moreover, I think the precedent of great importance.

I have always been dead against orders of merit and the like, but I think that men of letters and science who have been of use to the nation (Lord knows if I have) may fairly be ranked among its nominal or actual councillors.

As for yourself it is only one more kindness on the top of a heap so big I shall say nothing about it.

Mrs. Right Honourable sends her love to you both, and promises not to be proud.—Ever yours very faithfully,

T. H. HUXLEY.

CON-V-GEDAL HOTEL, BARMOUTH, *Aug. 20, 1892.*

MY DEAR DONNELLY—I began to think that Lord Salisbury had thought better of it—(I should not have been surprised at all if he had) and was going to leave me a P.P.C. instead of a P.C. when the announcement appeared yesterday.

This morning, however, I received his own letter (dated the 16th), which had been following me about. A very nice letter it is too—he does the thing handsomely while he is about it.

Well, I think the thing is good for science; I am not such a self humbug as to pretend that my vanity is not pleasantly tickled; but I do not think there is any aspect of the affair more pleasant to me, than the evidence it affords of the strength of our old friendship. Because with all respect for my noble friends, deuce a one would ever have thought of it, unless you had not only put it—but rubbed it—into their heads.

I have not forgotten that private and confidential document that you were so disgusted to find had been delivered to me! You have tried it on before—so don't deny it.

But bless my soul, how profound is old Cole's remark about the humour of public affairs. To think of a Conservative Government—pride of the Church—going out of its way to honour one not only of the wicked, but of the notorious and plain-spoken wickedness. My wife and I drove over to Dolgelly yesterday—do you know it? one of the loveliest things in the three kingdoms—and every now and then had a laugh over this very quaint aspect of the affair.

Can you tell me what I shall have to do in the dim and distant future? I suppose I shall have to go and swear somewhere (I am always ready to do that on occasion). Is admission to the awful presence of H.M. involved? Shall I have to rig up

again in that Court suit, which I hoped was permanently laid up in lavender? Resolve me these things.

We shall be here I expect at least another week; and bring up at Gloucester about the 3rd September. Hope to get back to Hodeslea latter part of September.—Ever yours faithfully,

T. H. HUXLEY.

### TO SIR J. D. HOOKER

*Aug. 20.*

You will have seen that I have been made a P.C. If I had been offered to be made a police constable I could not have been more flabbergasted than I was when the proposition came to me a few weeks ago. I will tell you the story of how it all came about when we meet. The Archbishopric of Canterbury is the only object of ambition that remains to me. Come and be Suf-fragan; there is plenty of room at Lambeth and a capital garden!

### TO HIS YOUNGEST DAUGHTER

CON-Y-GEDAL HOTEL, BARMOUTH, *Aug. 22, 1892.*

DEAREST BABS—If Lord Salisbury had known my address, M—— and I should have had our little joke out before leaving Saundersfoot,\* as the letter was dated 16th. It must be a month since Lord Cranbrook desired Donnelly to find out if I would accept the P.C., and as I heard no more about it up to the time of dissolution, I imagined there was a hitch somewhere. And really, the more I think of it the queerer does it seem, that a Tory and Church Government should have delighted to honour the worst-famed heretic in the three kingdoms.

I am sure Donnelly has been at the bottom of it, as he is the only person to whom I ever spoke of the fitness of the P.C. for men of science and letters.

The queer thing is that his chief and Lord Salisbury listened to the suggestion.

Tell Jack he is simply snuffed out—younger sons of peers go with the herd of Barts. and knights I believe. But a table of precedence is not to be had for love or money—and my anxiety is wearing.

This place is as perfectly delightful as Aberystwith was t'other. . . . With best love to you all—Ever your

PATER.

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\* Where he had been staying with his daughter.

## TO MRS. W. K. CLIFFORD

CON-Y-GEDAL HOTEL, BARMOUTH, *Aug. 22, 1892.*

MY DEAR LUCY—I am glad to think that it is the honours that blush and not the recipient, for I am past that form of vascular congestion.

It was known that the only peerage I would accept was a spiritual one; and as H.M. shares the not unnatural prejudice which led her illustrious predecessor (now some time dead) to object to give a bishopric to Dean Swift, it was thought she could not stand the promotion of Dean Huxley; would see\* him in fact . . .

Lord S. apologised for not pressing the matter, but pointed out that, as Evolutionism is rapidly gaining ground among the people who have votes, it was probable, if not certain, that his eminent successor (whose mind is always open) would become a hot evolutionist before the expiration of the eight months' office which Lord S. (who needs rest) means to allow him. And when eminent successor goes out, my bishopric will be among the Dissolution Honours. If H.M. objects she will be threatened with the immediate abolition of the H. of Lords, and the institution of a social democratic federation of counties, each with an army, navy, and diplomatic service of its own.

I know you like to have the latest accurate intelligence, but this really must be considered confidential. As a P.C. I might lose my head for letting out State secrets.—Ever your affectionate  
PATER.

## TO SIR JOSEPH FAYRER

CON-Y-GEDAL HOTEL, BARMOUTH, WALES,  
*Aug. 28, 1892.*

It is very pleasant to get the congratulations of an old friend like yourself. As we went to Osborne the other day I looked at the old *Victory* and remembered that six and forty years ago I went up her side to report myself on appointment, as a poor devil of an assistant surgeon. And I should not have got that far if you had not put it into my head to apply to Burnett.

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\* This is a pun.



## TO SIR JOSEPH PRESTWICH

CON-Y-GEDAL HOTEL, BARMOUTH, *Aug.* 31, 1892.

MY DEAR PRESTWICH—Best thanks for your congratulations. As I have certainly got more than my temporal deserts, the other “half” you speak of can be nothing less than a bishopric! May you live to see that dignity conferred; and go on writing such capital papers as the last you sent me, until I write myself your Right Revd. as well as Right Honble. old friend,

T. H. HUXLEY.

## TO SIR W. H. FLOWER

CON-Y-GEDAL HOTEL, BARMOUTH, *Aug.* 31, 1892.

MY DEAR FLOWER—Many thanks for your congratulations, with Lady Flower’s postscript not forgotten. I should have answered you letter sooner, but I had to go to Osborne last week in a hurry, kiss hands and do my swearing. It was very funny that the Gladstone P.C.’s had the pleasure of welcoming the Salisbury P.C.’s among their first official acts!

I will gladly come to as many meetings of the Trustees as I can. Only you must not expect me in very severe weather like that so common last year. My first attack of pleurisy was dangerous and not painful; the second was painful and not dangerous; the third will probably be both painful and dangerous, and my commander-in-chief (who has a right to be heard in such matters) will not let me run the risk of it.

But I have marked down Oct. 22 and Nov. 24, and nothing short of snow shall stop me.

As to what you want to do, getting butter out of a dog’s mouth is an easier job than getting patronage out of that of a lawyer or an ecclesiastic. But I am always good for a forlorn hope, and we will have a try.

We shall not be back at Eastbourne till the latter half of September, and I doubt if we shall get into our house even then. We leave this for Gloucester, where we are going to spend the festival week with my daughter to-morrow.—With our love to you both, ever yours very faithfully,

T. H. HUXLEY.

I see a report that Owen is sinking. Poor old man; it seems queer that just as I am hoist to the top of my tree he should be going underground. But at 88 life cannot be worth much.

## TO MR. W. F. COLLIER

CON-Y-GEDAL HOTEL, BARMOUTH WATER,  
*Aug. 31, 1892.*

Accept my wife's and my hearty thanks for your kind congratulations. When I was a mere boy I took for motto of an essay, "What is honour? Who hath it? He that died o' Wednesday," and although I have my full share of ambition and vanity, I doubt not, yet Falstaff's philosophical observation has dominated my mind and acted as a sort of perpetual refrigerator to these passions. So I have gone my own way, sought for none of these things and expected none—and it would seem that the deepest schemer's policy could not have answered better. We must have a new Beatitude, "Blessed is the man who expecteth nothing," without its ordinary appendix.

I tell Jack\* I have worked hard for a dignity which will enable me to put down his aristocratic swaggering.

It took some time, however, to get used to the title, and it was October before he wrote:—

The feeling that "The Right Honble." on my letters is a piece of chaff is wearing off, and I hope to get used to my appendix in time.

The "very quaint" ceremony of kissing hands is described at some length in a letter to Mrs. Huxley from London on his way back from Osborne:—

GREAT WESTERN HOTEL, *Aug. 25, 1892, 6.40 P.M.*

I have just got back from Osborne, and I find there are a few minutes to send you a letter—by the help of the extra halfpenny. First-rate weather there and back, a special train, carriage with postillions at the Osborne landing-place, and a grand procession of officers of the new household and P.C.'s therein. Then waiting about while the various "sticks" were delivered.

Then we were shown into the presence chamber where the Queen sat at a table. We knelt as if we were going to say our prayers, holding a testament between two, while the Clerk of the Council read an oath of which I heard not a word. We each advanced to the Queen, knelt and kissed her hand, retired backwards, and got sworn over again (Lord knows what I promised

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\* His son-in-law, Hon. John Collier.

and vowed this time also). Then we shook hands with all the P.C.'s present, including Lord Lorne, and so exit backwards. It was all very curious. . . .

After that a capital lunch and back we came. Ribblesdale and several other people I knew were of the party, and I found it very pleasant talking with him and Jesse Collings, who is a very interesting man.

"Oh," he said, "how I wish my poor mother, who was a labouring woman—a great noble woman—and brought us nine all up in right ways, could have been alive." Very human and good and dignified too, I thought.

He also used to tell how he was caught out when he thought to make use of the opportunity to secure a close view of the Queen. Looking up, he found her eyes fixed upon him; Her Majesty had clearly taken the opportunity to do the same by him.

Regarding the Privy Councillorship as an exceptional honour for science, over and above any recognition of his personal services, which he thought amply met by the Civil List pension specially conferred upon him as an honour at his retirement from the public service, Huxley was no little vexed at an article in *Nature* for August 25 (vol. xlvi. p. 397), reproaching the Government for allowing him to leave the public service six years before, without recognition. Accordingly he wrote to Sir J. Donnelly on August 27:—

It is very unfair to both Liberal and Conservative Governments, who did much more for me than I expected, and I feel that I ought to contradict the statement without loss of time.

So I have written the inclosed letter for publication in *Nature*. But as it is always a delicate business to meddle with official matters, I wish you would see if I have said anything more than I ought to say in the latter half of the letter. If so, please strike it out, and let the first half go.

I had a narrow shave to get down to Osborne and kiss hands on Thursday. What a quaint ceremony it is!

The humour of the situation was that we three hot Unionists, White Ridley, Jesse Collings, and I, were escorted by the whole Gladstonian household.

And again on August 30:—

In the interview I had with Lord Salisbury on the subject of an order of merit—ages ago\*—I expressly gave him to understand that I considered myself out of the running—having already received more than I had any right to expect. And when he has gone out of his way to do honour to science, it is stupid of *Nature* to strike the discordant note.

His letter appeared in *Nature* of September 1 (vol. xlvi. p. 416). In it he declared that both Lord Salisbury's and Mr. Gladstone's Governments had given him substantial recognition; that Lord Iddesleigh had put the Civil List pension expressly as an honour; and finally, that he himself placed this last honour in the category of "unearned increments."

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\* See p. 175.

## CHAPTER XX

1892

THE following letters are mainly of personal interest; some merely illustrate the humorous turn he would give to his more intimate correspondence; others strike a more serious note, especially those to friends whose powers were threatened by overwork or ill-health.

With these may fitly come two other letters; one to a friend on his re-marriage, the other to his daughter, in reply to a birthday letter.

My wife and I send our warmest good wishes to your future wife and yourself. I cannot but think that those who are parted from us, if they have cognisance of what goes on in this world, must rejoice over everything that renders life better and brighter for the sojourners in it—especially of those who are dear to them. At least, that would be my feeling.

Please commend us to Miss —, and beg her not to put us on the "Index," because we count ourselves among your oldest and warmest friends.

### TO HIS DAUGHTER, MRS. ROLLER

HODESLEA, EASTBOURNE, *May 5, 1892.*

It was very pleasant to get your birthday letter and the photograph, which is charming.

The love you children show us, warms our old age better than the sun.

For myself, the sting of remembering troops of follies and errors, is best alleviated by the thought that they may make me better able to help those who have to go through like experiences, and who are so dear to me that I would willingly pay an even heavier price, to be of use. Depend upon it, that confounded "just man who needed no repentance" was a very poor

sort of a father. But perhaps his daughters were "just women" of the same type; and the family circle as warm as the interior of an ice-pail.

A certain artist, who wanted to have Huxley sit to him, tried to manage the matter through his son-in-law, Hon. J. Collier, to whom the following is addressed:—

HODESLEA, EASTBOURNE, *Jan. 27, 1892.*

MY DEAR JACK—Inclosed is a letter for you. Will you commit the indiscretion of sending it on to Mr. A. B. if you see no reason to the contrary?

I hope the subsequent proceedings will interest you no more.

I am sorry you have been so bothered by the critter—but in point of pertinacity he has met his match. (I have no objection to your saying that your father-in-law is a brute, if you think that will soften his disappointment.)

Here the weather has been tropical. The bananas in the new garden are nearly ripe, and the cocoanuts are coming on. But of course you expect this, for if it is unbearably sunny in London what must it be here?

All our loves to all of you.—Ever yours affectionately,

PATER.

HODESLEA, EASTBOURNE, *Feb. 1, 1892.*

MY DEAR HOOKER—I hear you have influenza rampaging about the Camp;\* and I want to point out to you that if you want a regular bad bout of it, the best thing you can do is to go home next Thursday evening, at ten o'clock at night, and plunge into the thick of the microbes, tired and chilled.

If you don't get it then, you will, at any rate, have the satisfaction of feeling that you have done your best!

I am going to the *x*, but then you see I fly straight after dinner to Collier's per cab, and there is no particular microbe army in Eton Avenue lying in wait for me.

Either let me see after the dinner, or sleep in town, and don't worry.—Yours affectionately,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *Feb. 19, 1892.*

MY DEAR HOOKER—I have just received a notice that Hirst's funeral is to-morrow. But we are in the midst of the bitterest easterly gale and snowfall we have had all the winter, and there is no sign of the weather mending.

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\* The name of Sir J. Hooker's house at Sunningdale.

Neither you nor I have any business to commit suicide for that which after all is a mere sign of the affection we have no need to prove for our dear old friend, and the chances are that half an hour cold chapel and grave-side on a day like this would finish us.

I write this not that I imagine you would think of going, but because my last note spoke so decidedly of my own intention.

But who could have anticipated this sudden reversion to Arctic conditions?—Ever yours affectionately,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *March 18, 1892.*

MY DEAR DONNELLY—My wife got better and was out for a while yesterday, but she is knocked up again to-day.

It would have been very pleasant to see you both, but you must not come down till we get fixed with a new cook and maid, as I believe we are to be in a week or so. None of your hotel-going!

I mourn over the departure of the present cook—I believe she is going for no other reason than that she is afraid the house will fall on such ungodly people as we are, and involve her in the ruins. That is the modern martyrdom—you don't roast infidels, but people who can roast go to the pious.

Lovely day to-day, nothing but east wind to remind one it is not summer.—Crocuses coming out at last.—Ever yours very faithfully,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *April 3, 1892.*

MY DEAR HOOKER—As I so often tell my wife, “your confounded sense of duty will be the ruin of you.” You really, club or no club, had no business to be travelling in such a bitter east wind. However, I hope the recent sunshine has set you up again.

Barring snow or any other catastrophe, I will be at “the Club” dinner on the 26th and help elect the P.R.S. I don't think I go more than once a year, and like you I find the smaller the pleasanter meetings.

I was very sorry to see Bowman's death. What a first-rate man of science he would have been if the Professorship at King's College had been £1000 a year. But it was mere starvation when he held it.

I am glad to say that my wife is much better—thank yours for her very kind sympathy. I was very down the last time I wrote to you.—Ever yours affectionately,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *March 27, 1892.*

MY DEAR HOOKER—I had to run up to town on Friday and forgot your letter. The  $x$  is a puzzle—I will stick by the ship as long as you do, depend upon that. I fear we can hardly expect to see dear old Tyndall there again. As for myself, I dare not venture when snow is on the ground, as on the last two occasions. And now, I am sorry to say, there is another possible impediment in my wife's state of health.

I have had a very anxious time of it altogether lately. But sich is life!

My sagacious granddaughter Joyce (gone home now) observed to her grandmother some time ago—"I don't want to grow up." "Why don't you want to grow up?" "Because I notice that grown-up people have a great deal of trouble." Sagacious philosopheress of 7!—Ever yours affectionately,

T. H. HUXLEY.

HODESLEA, *June 27, 1892.*

MY DEAR FOSTER—My wife has been writing to Mrs. Foster to arrange for your visit, which will be heartily welcome.

Now I don't want to croak. No one knows better than I, the fatal necessity for any one in your position: more than that, the duty in many cases of plunging into public functions, and all the guttle, guzzle, and gammon therewith connected.

But do let me hold myself up as the horrid example of what comes of that sort of thing for men who have to work as you are doing and I have done. To be sure you are a "lungy" man and I am a "livery" man, so that your chances of escaping candle-snuff accumulations with melancholic prostration are much better. Nevertheless take care. The pitcher is a very valuable piece of crockery, and I don't want to live to see it cracked by going to the well once too often.

I am in great spirits about the new University movement, and have told the rising generation that this old hulk is ready to be towed out into line of battle, if they think fit, which is more commendable to my public spirit than my prudence.—Ever yours,

T. H. HUXLEY.

HODESLEA, *June 20, 1892.*

MY DEAR ROMANES—My wife and I, no less than the Hookers who have been paying us a short visit, were very much grieved to hear that such serious trouble has befallen you.

In such cases as yours (as I am sure your doctors have told you) hygienic conditions are everything—good air and idleness,



*construed strictly*, among the chief. You should do as I have done—set up a garden and water it yourself for two hours every day, besides pottering about to see how things grow (or don't grow this weather) for a couple more.

Sundry box-trees, the majority of which have been getting browner every day since I planted them three months ago, have interested me almost as much as the general election. They typify the Empire with the G.O.M. at work at the root of it!  
—Ever yours very faithfully,  
T. H. HUXLEY.

HODESLEA, Oct. 18, 1892.

MY DEAR ROMANES—I throw dust and ashes on my head for having left your letter almost a week unanswered. But I went to Tennyson's funeral; and since then my whole mind has been given to finishing the reply forced upon me by Harrison's article in the *Fortnightly*, and I have let correspondence slide. I think it will entertain you when it appears in November—and perhaps interest—by the adumbration of the line I mean to take if ever that "Romanes" Lecture at Oxford comes off.

As to Madeira—I do not think you could do better. You can have as much quiet there as in Venice, for there are next to no carts or carriages. I was at an excellent hotel, the "Bona Vista," kept by an Englishman in excellent order, and delightfully situated on the heights outside Funchal. When once acclimatised and able to bear moderate fatigue, I should say nothing would be more delightful and invigorating than to take tents and make the round of the island. There is nothing I have seen anywhere which surpasses the cliff scenery of the north side, or on the way thither, the forest of heaths as big as sycamores.

There is a matter of natural history which might occupy without fatiguing you, and especially without calling for any great use of the eyes. That is the effect of Madeiran climate on English plants transported there—and the way in which the latter are beating the natives. There is a Doctor who has lots of information on the topic. You may trust anything but his physic.

[The rest of the letter gives details about scientific literature touching Madeira.]

A piece of advice to his son anent building a house :—

Sept. 22, 1892.

Lastly and biggestly, don't promise anything, agree to anything, nor sign anything (swear you are an "illiterate voter"

rather than this last) without advice—or you may find yourself in a legal quagmire. Builders, as a rule, are on a level with horsedealers in point of honesty—I could tell you some pretty stories from my small experience of them.

The next, to Lord Farrer, is *apropos* of quite an extensive correspondence in the *Times* as to the correct reading of the well-known lines about the missionary and the cassowary, to which both Huxley and Lord Farrer had contributed their own reminiscences.

HODESLEA, Oct. 15, 1892.

MY DEAR FARRER—

If *you* were a missionary  
In the heat of Timbuctoo  
*You'd* wear nought but a nice and airy  
Pair of bands—p'raps cassock too.

Don't you see the fine touch of local colour in my version! Is it not obvious to everybody who understands the methods of high *a priori* criticism that this consideration entirely outweighs the merely empirical fact that your version dates back to 1837—which I must admit is before my adolescence? It is obvious to the meanest capacity that mine must be the original text in "Idee," whatever your wretched "Wirklichkeit" may have to say to the matter.

And where, I should like to know, is a glimmer of a scintilla of a hint that the missionary was a dissenter? I claim him for my dear National Church.—Ever yours, T. H. HUXLEY.

The following is about a document which he had forgotten that he wrote:—

HODESLEA, EASTBOURNE, Nov. 24, 1892.

MY DEAR DONNELLY—It is obvious that you have somebody in the Department who is an adept in the imitation of handwriting.

As there is no way of proving a negative, and I am too loyal to raise a scandal, I will just father the scrawl.

Positively, I had forgotten all about the business. I suppose because I did not hear who was appointed. It would be a good argument for turning people out of office after 65! But I have always had rather too much of the lawyer faculty of forgetting things when they are done with.

It was very jolly to have you here, and on principles of Christian benevolence you must not be so long in coming again.  
—Ever yours,  
T. H. HUXLEY.

I do not remember being guilty of paying postage—but that doesn't count for much.

The following is an answer to one of the unexpected inquiries which would arrive from all quarters. A member of one of the religious orders working in the Church of England wrote for an authoritative statement on the following point, suggested by passages in section 5 of Chapter I. of the "Elementary Physiology":—When the Blessed Sacrament, consisting, temporarily and mundanely speaking, of a wheaten wafer and some wine, is received after about seven hours' fast, is it or is it not "voided like other meats"? In other words, does it not become completely absorbed for the sustenance of the body?

Huxley's help in this physiological question—and his answer was to be used in polemical discussion—was sought because an answer from him would be decisive and would obviate the repetition of statements which to a Catholic were painfully irreverent.

HODESLEA, *Feb.* 3, 1892.

SIR—I regret that you have had to wait so long for a reply to your letter of the 27th. Your question required careful consideration, and I have been much occupied with other matters.

You ask (1), whether the sacramental bread is or is not "voided like other meats"?

That depends on what you mean, firstly by "voided," and, secondly, by "other meats." Suppose any "meat" (I take the word to include drink) to contain no indigestible residuum, there need not be anything "voided" at all—if by "voiding" is meant expulsion from the lower intestine.

Such a meat might be "completely absorbed for the sustenance of the body." Nevertheless, its elements, in fresh combinations, would be eventually "voided" through other channels, *e.g.* the lungs and kidneys. Thus I should say that under normal circumstances all "meats" (that is to say, the material substance of them) are voided sooner or later.

Now, as to the particular case of the sacramental wafer and wine. Taking their composition and the circumstances of ad-

ministration to be as you state them, it is my opinion that a small residuum will be left undigested, and will be voided by the intestine, while by far the greater part will be absorbed and eventually "voided" by the lungs, skin, and kidneys.

If anyone asserts that the wafer and wine are voided by the intestine as such, that the "pure flour and water" of which the wafer consists pass out unchanged, I am of opinion he is in error.

On the other hand, if anyone maintains that the material substance of the wafer persists, while its accidents change, within the body, and that this identical substance is sooner or later voided, I do not see how he is to be driven out of that position by any scientific reasoning. On the contrary, there is every reason to believe that the elementary particles of the wafer and of the wine which enter the body never lose their identity, or even alter their mass. If one could see one of the atoms of carbon which enter into the composition of the wafer, I conceive it could be followed the whole way—from the mouth to the organ by which it escapes—just as a bit of floating charcoal might be followed into, through, and out of a whirlpool.

On October 6, 1892, died Lord Tennyson. In the course of his busy life, Huxley had not been thrown very closely into contact with him; they would meet at the Metaphysical Society, of which Tennyson was a silent member; and in the *Life of Tennyson* two occasions are recorded on which Huxley visited him:—

*Nov. 11, 1871.*—Mr. Huxley and Mr. Knowles arrived here (Aldworth) on a visit. Mr. Huxley was charming. We had much talk. He was chivalrous, wide, and earnest, so that one could not but enjoy talking with him. There was a discussion on George Eliot's humility. Huxley and A. both thought her a humble woman, despite a dogmatic manner of assertion that had come upon her latterly in her writings. (*Op. cit.* ii. 110.)

*March 17, 1873.*—Professor Tyndall and Mr. Huxley called. Mr. Huxley seemed to be universal in his interest, and to have keen enjoyment of life. He spoke of *In Memoriam*. (*Ibid.* ii. 143.)

With this may be compared one of Mr. Wilfrid Ward's reminiscences (*Nineteenth Century*, August 1896).

"Huxley once spoke strongly of the insight into scientific method shown in Tennyson's *In Memoriam*, and pronounced it to be quite equal to that of the greatest experts."

This view of Tennyson appears again in a letter to Sir M. Foster, the Secretary of the Royal Society:—

Was not Tennyson a Fellow of the Royal Society? If so, should not the President and Council take some notice of his death and delegate some one to the funeral to represent them? Very likely you have thought of it already.

He was the only modern poet, in fact I think the only poet since the time of Lucretius, who has taken the trouble to understand the work and tendency of the men of science.

But this was not the only side from which he regarded poetry. He had a keen sense for beauty, the artistic perfection of expression, whether in poetry, prose, or conversation. Tennyson's talk he described thus: "Doric beauty is its characteristic—perfect simplicity, without any ornament or anything artificial." And again, to quote Mr. Wilfrid Ward's reminiscences:—

Tennyson he considered the greatest English master of melody except Spenser and Keats. I told him of Tennyson's insensibility to music, and he replied that it was curious that scientific men, as a rule, had more appreciation of music than poets or men of letters. He told me of one long talk he had had with Tennyson, and added that immortality was the one dogma to which Tennyson was passionately devoted.

Of Browning, Huxley said: "He really has music in him. Read his poem *The Thrush* and you will see it. Tennyson said to me," he added, "that Browning had plenty of music *in* him, but he could not get it *out*."

EASTBOURNE, Oct. 15, 1892.

MY DEAR TYNDALL—I think you will like to hear that the funeral yesterday lacked nothing to make it worthy of the dead or the living.

Bright sunshine streamed through the windows of the nave, while the choir was in half gloom, and as each shaft of light illuminated the flower-covered bier as it slowly travelled on, one thought of the bright succession of his works between the darkness before and the darkness after. I am glad to say that the Royal Society was represented by four of its chief officers, and nine of the commonalty, including myself. Tennyson has a right to that, as the first poet since Lucretius who has understood the drift of science.

We have heard nothing of you and your wife for ages. Ask her to give us news, good news I hope, of both.

My wife is better than she was, and joins with me in love.—  
Ever yours affectionately, T. H. HUXLEY.

On his way home from the funeral in Westminster Abbey, Huxley passed the time in the train by shaping out some lines on the dead poet, the form of them suggested partly by some verses of his wife's, partly by Schiller's

Gib diesen Todten mir heraus,  
Ich muss ihn wieder haben,\*

which came back to his mind in the Abbey. The lines were published in the *Nineteenth Century* for November 1892. He declared that he deserved no credit for the verses; they merely came to him in the train.

His own comparison of them with the sheaf of professed poets' odes which also appeared in the same magazine, comes in a letter to his wife, to whom he sent the poem as soon as it appeared in print.

I know you want to see the poem, so I have cut it and the rest out of the *Nineteenth* just arrived, and sent it.

If I were to pass judgment upon it in comparison with the others, I should say, that as to style it is hammered, and as to feeling human.

They are castings of much prettier pattern and of mainly poetico-classical educated-class sentiment. I do not think there is a line of mine one of my old working-class audience would have boggled over. I would give a penny for John Burns' thoughts about it. (*N.B.*—Highly impartial and valuable criticism.)

He also wrote to Professor Romanes, who had been moved by this new departure to send him a volume of his own poems:—

HODESLEA, Nov. 3, 1892.

MY DEAR ROMANES—I must send you a line to thank you very much for your volume of poems. A swift glance shows me much that has my strong sympathy—notably "Pater loquitur," which I shall read to my wife as soon as I get her back. Against

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\* *Don Carlos*, Sc. ix.

all troubles (and I have had my share) I weigh a wife-comrade "treu und fest" in all emergencies.

I have a great respect for the Nazarenism of Jesus—very little for later "Christianity." But the only religion that appeals to me is prophetic Judaism. Add to it something from the best Stoics and something from Spinoza and something from Goethe, and there is a religion for men. Some of these days I think I will make a cento out of the works of these people.

I find it hard enough to write decent prose and have usually stuck to that. The "Gib diesen Todten" I am hardly responsible for, as it did itself coming down here in the train after Tennyson's funeral. The notion came into my head in the Abbey.—Ever yours very faithfully, T. H. HUXLEY.

This winter also Sir R. Owen died, and was buried at Ham on December 23. The grave ends all quarrels, and Huxley intended to be present at the funeral. But as he wrote to Dr. Foster on the 23rd:—

I had a hard morning's work at University College yesterday, and what with the meeting of the previous evening and that infernal fog, I felt so seedy that I made up my mind to go straight home and be quiet. . . .

There has been a bitter north-easter all day here, and if the like has prevailed at Ham I am glad I kept out of it, as I am by no means fit to cope with anything of that kind to-day. I do not think I was bound to offer myself up to the manes of the departed, however satisfactory that might have been to the poor old man. Peace be with him!

But the old-standing personal differences between the two made it difficult for him to decide what to do with regard to a meeting to raise some memorial to the great anatomist. He writes again to Sir M. Foster, January 8, 1893:—

What am I to do about the meeting about Owen's statue on the 21st? I do not wish to pose either as a humbugging approver or as a sulky disapprover. The man did honest work, enough to deserve his statue, and that is all that concerns the public.

And on the 18th:—

I am inclined to think that I had better attend the meeting at all costs. But I do not see why I should speak unless I am called upon to do so.

I have no earthly objection to say all that I honestly can of good about Owen's work—and there is much to be said about some of it—on the contrary, I should be well pleased to do so.

But I have no reparation to make; if the business were to come over again, I should do as I did. My opinion of the man's character is exactly what it was, and under the circumstances there is a sort of hypocrisy about volunteering anything, which goes against my grain.

The best position for me would be to be asked to second the resolution for the statue—then the proposer would have the field of personal fiction and butter-boat all to himself.

### TO SIR W. H. FLOWER

Dec. 28, 1892.

I think you are quite right in taking an active share in the movement for the memorial. When a man is dead and can do no

merits  
more harm, one must do a sum in subtraction,  $\frac{\text{deserts}}{x+x+x}$  and if

the  $x$ 's are not all minus quantities, give him credit accordingly. But I think that in your appeal, for which the Committee will be responsible, it is this balance of solid scientific merit—a good big one in Owen's case after all deductions—which should be alone referred to. If you follow the example of *Vanity Fair* and call him “a simple-minded man, who, had he been otherwise, would long ago have adorned a title,” some of us may choke.

Gladstone, Samuel of Oxford, and Owen belong to a very curious type of humanity, with many excellent and even great qualities and one fatal defect—utter untrustworthiness. Peace be with two of them, and may the political death of the third be speedy and painless!—With our united best wishes, ever yours very faithfully,

T. H. HUXLEY.

And on January 22, 1893, he writes of the meeting:—

MY DEAR HOOKER— . . . What queer corners one gets into if one only lives long enough! The grim humour of the situation when I was seconding the proposal for a statue to Owen yesterday tickled me a good deal. I do not know how they will report me in the *Times*, but if they do it properly I think you will see that I said no word upon which I could not stand cross-examination.



I chose the office of seconder in order that I might clearly define my position and stop the mouths of blasphemers—who would have ascribed silence or absence to all sorts of bad motives.

Whatever the man might be, he did a lot of first-rate work, and now that he can do no more mischief he has a right to his wages for it.

If I only live another ten years I expect to be made a saint of myself. "Many a better man has been made a saint of," as old David Hume said to his housekeeper when they chalked up "St. David's Street" on his wall.

We have been jogging along pretty well, but wife has been creaky, and I got done up in a brutal London fog struggling with the worse fog of the New University.

I am very glad you like my poetical adventure.—Ever yours affectionately,

T. H. HUXLEY.

This speech had an unexpected sequel. Owen's grandson was so much struck by it that he wrote asking Huxley to undertake a critical account of his anatomical work for the book—another most unexpected turn of events. It is not often that a conspicuous opponent of a man's speculations is asked to pass judgment upon his entire work.\*

At the end of the year an anonymous attack upon the administration of the Royal Society was the occasion for some characteristic words on the endurance of abuse to his old friend, M. Foster, then Secretary of the Royal Society.

Dec. 5, 1892.

MY DEAR FOSTER—The braying of my donkey prevented me from sending a word of sympathy about the noise made by yours. . . . Let not thine heart be vexed because of these sons of Belial. It is all sound and fury with nothing at the bottom of it, and will leave no trace a year hence. I have been abused a deal worse—without the least effect on my constitution or my comfort.

In fact, I am told that Harrison is abusing me just now like a pickpocket in the *Fortnightly*, and I only make the philosophical reflection, No wonder! and doubt if the reading it is worth half a crown.—Ever yours affectionately,

T. H. HUXLEY.

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\* See p. 387.

The following letter to Mr. Clodd, thanking him for the new edition of Bates' *Naturalist on the Amazons*, helps to remove a reproach sometimes brought against the Royal Society, in that it ignored the claims of distinguished men of Science to membership of the Society:—

HODESLEA, EASTBOURNE, Dec. 9, 1892.

MY DEAR MR. CLODD—Many thanks for the new edition of "Bates." I was reading the Life last night with great interest; some of the letters you have printed are admirable.

Lyell is hit off to the life. I never read a more penetrating character-sketch. Hooker's letter of advice is as sage as might be expected from a man who practised what he preached about as much as I have done. I shall find material for chaff the next time my old friend and I meet.

I think you are a little hard on the Trustees of the British Museum, and especially on the Royal Society. The former are hampered by the Treasury and the Civil Service regulations. If a Bates turned up now I doubt if one could appoint him, however much one wished it, unless he would submit to some idiotic examination. As to the Royal Society, I undertake to say that Bates might have been elected fifteen years earlier if he had so pleased. But the Council cannot elect a man unless he is proposed, and I always understood that it was the *res angusta* which stood in the way.

It is the same with ——. (Twenty years ago) the Royal Society awarded him the Royal Medal, which is about as broad an invitation to join us as we could well give a man. In fact, I do not think he has behaved well in quite ignoring it. Formerly there was a heavy entrance fee as well as the annual subscription. But a dozen or fifteen years ago the more pecunious Fellows raised a large sum of money for the purpose of abolishing this barrier. At present a man has to pay only £3 a year and no entrance. I believe the publications of the Society, which he gets, will sell for more.\*

So you see it is not the fault of the Royal Society if anybody who ought to be in keeps out on the score of means.—Ever yours very faithfully,

T. H. HUXLEY.

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\* The "Fee Reduction Fund," as it is now called, enables the Society to relieve a Fellow from the payment even of his annual fee, so that being F.R.S. costs him nothing.

## CHAPTER XXI

1893

THE year 1893 was, save for the death of three old friends, Andrew Clark, Jowett, and Tyndall, one of the most tranquil and peaceful in Huxley's whole life. He entered upon no direct controversy; he published no magazine articles; to the general misapprehension of the drift of his Romanes Lecture he only replied in the comprehensive form of Prolegomena to a reprint of the lecture. He began to publish his scattered essays in a uniform series, writing an introduction to each volume. While collecting his "Darwiniana" for the second volume, he wrote to Mr. Clodd:—

HODESLEA, EASTBOURNE, *Nov.* 18, 1892.

I was looking through *Man's Place in Nature* the other day. I do not think there is a word I need delete, nor anything I need add except in confirmation and extension of the doctrine there laid down. That is great good fortune for a book thirty years old, and one that a very shrewd friend of mine implored me not to publish, as it would certainly ruin all my prospects. I said, like the French fox-hunter in *Punch*, "I shall try."

The shrewd friend in question was none other than Sir William Lawrence, whose own experiences after publishing his book *On Man*, "which now might be read in a Sunday school without surprising anybody," are alluded to in Vol. I. p. 191.

He had the satisfaction of passing on his unfinished work upon *Spirula* to efficient hands for completion; and in the way of new occupation, was thinking of some day "taking up the threads of late evolutionary speculation" in

the theories of Weismann and others,\* while actually planning out and reading for a series of "Working-Men's Lectures on the Bible," in which he should present to the unlearned the results of scientific study of the documents, and do for theology what he had done for zoology thirty years before.

The scheme drawn out in his note-book runs as follows:—

- I. The subject and the method of treating it.
- II. Physical conditions:—the place of Palestine in the Old World.
- III. The Rise of Israel:—Judges, Samuel, Kings as far as Jeroboam II.
- IV. The Fall of Israel.
- V. The Rise and Progress of Judaism. Theocracy.
- VI. The Final Dispersion.
- VII. Prophetism.
- VIII. Nazarenism.
- IX. Christianity.
- X. Muhammedanism.
- XI. and XII. The Mythologies.

Although this scheme was never carried out, yet it was constantly before Huxley's mind during the two years left to him. If Death, who had come so near eight years before, would go on seeming to forget him, he meant to use these last days of his life in an effort to illuminate one more portion of the field of knowledge for the world at large.

As the physical strain of the Romanes Lecture and his liability to loss of voice warned him against any future attempt to deliver a course of lectures, he altered his design and prepared to put the substance of these Lectures to Working-Men into a Bible History for young people. And indeed, he had got so far with his preparation, that the latter heading was down in his list of work for the last year of his life, 1895. But nothing of it was ever written. Until the work was actually begun, even the framework upon which it was to be shaped remained in his mind, and the

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\* See letter of September 28, to Romanes.

copious marks in his books of reference were the mere guide-posts to a strong memory, which retained not words and phrases, but salient facts and the knowledge of where to find them again.

I find only two occasions on which he wrote to the *Times* this year; one, when the crusade was begun to capture the Board Schools of London for sectarianism, and it was suggested that, when on the first School Board, he had approved of some such definite dogmatic teaching. This he set right at once in the following letter of April 28, with which may be compared the letter to Lord Farrer of November 6, 1894.

In a leading article of your issue to-day you state, with perfect accuracy, that I supported the arrangement respecting religious instruction agreed to by the London School Board in 1871, and hitherto undisturbed. But you go on to say that "the persons who framed the rule" intended it to include definite teaching of such theological dogmas as the Incarnation.

I cannot say what may have been in the minds of the framers of the rule; but, assuredly, if I had dreamed that any such interpretation could fairly be put upon it, I should have opposed the arrangement to the best of my ability.

In fact, a year before the rule was framed I wrote an article in the *Contemporary Review*, entitled "The Board Schools—what they can do, and what they may do," in which I argued that the terms of the Education Act excluded such teaching as it is now proposed to include. And I supported my contention by the following citation from a speech delivered by Mr. Forster at the Birkbeck Institution in 1870:—

"I have the fullest confidence that in the reading and explaining of the Bible, what the children will be taught will be the great truths of Christian life and conduct, which all of us desire they should know, and that no effort will be made to cram into their poor little minds, theological dogmas which their tender age prevents them from understanding."

The other was on a lighter, but equally perennial point of interest, being nothing less than the Sea Serpent. In the *Times* of January 11, he writes, that while there is no reason against a fifty-foot serpent existing as in Cretaceous seas, still the evidence for its existence is entirely incon-

clusive. He goes on to tell how a scientific friend's statement once almost convinced him until he read the quartermaster's deposition, which was supposed to corroborate it. The details made the circumstances alleged by the former impossible, and on pointing this out, he heard no more of the story, which was a good example of the mixing up of observations with conclusions drawn from them.

And on the following day he replies to another such detailed story—

Admiral Mellersh says, "I saw a huge snake, at least 18 feet long," and I have no doubt he believes he is simply stating a matter of fact. Yet his assertion involves a hypothesis of the truth of which I venture to be exceedingly doubtful. How does he know that what he saw was a snake? The neighbourhood of a creature of this kind, within axe-stroke, is hardly conducive to calm scientific investigation, and I can answer for it that the discrimination of genuine sea-snakes in their native element from long-bodied fish is not always easy. Further, that "back fin" troubles me; looks, if I may say so, very fishy.

If the caution about mixing up observations with conclusions, which I ventured to give yesterday, were better attended to, I think we should hear very little either about antiquated sea-serpents or new "mesmerism."

It is perhaps not superfluous to point out that in this, as in other cases of the marvellous, he did not merely pooh-pooh a story on the ground of its antecedent improbability, but rested his acceptance or rejection of it upon the strength of the evidence adduced. On the other hand, the weakness of such evidence as was brought forward time after time, was a justification for refusing to spend his time in listening to similar stories based on similar testimony.

Among the many journalistic absurdities which fall in the way of celebrities, two which happened this year are worth recording; the one on account of its intrinsic extravagance, which succeeded nevertheless in taking in quite a number of sober folk; the other on account of the letter it drew from Huxley about his cat. The former appeared in the shape of a highly-spiced advertisement about certain Manx Mannikins, which could walk, draw, play, in fact do

everything but speak—were living pets which might be kept by anyone, and indeed Professor Huxley was the possessor of a remarkably fine pair of them. Apply, enclosing stamps etc. Of course, the wonderful mannikins were nothing more than the pair of hands which anybody could dress up according to the instructions of the advertiser; but it was astonishing how many estimable persons took them for some *lusus naturæ*. A similar advertisement in 1880 had been equally successful, and one exalted personage wrote by the hand of a secretary to say what pleasure and interest had been excited by the description of these strange creatures, and begging Professor Huxley to state if the account was true. Accordingly on January 27 he writes to his wife, who was on a visit to her daughter:—

Yesterday two ladies called to know if they could see the Manx Mannikins. I think of having a board put up to say that in the absence of the Proprietress the show is closed.

The other incident was a request for any remarks which might be of use in an article upon the Home Pets of Celebrities. I give the letter written in answer to this, as well as descriptions of the same cat's goings-on in the absence of its mistress.

TO MR. J. G. KITTON

HODESLEA, *April 12, 1893.*

A long series of cats has reigned over my household for the last forty years, or thereabouts, but I am sorry to say that I have no pictorial or other record of their physical and moral excellencies.

The present occupant of the throne is a large, young, grey Tabby—Oliver by name. Not that he is in any sense a protector, for I doubt whether he has the heart to kill a mouse. However, I saw him catch and eat the first butterfly of the season, and trust that this germ of courage, thus manifested, may develop with age into efficient mousing.

As to sagacity, I should say that his judgment respecting the warmest place and the softest cushion in a room is infallible—his punctuality at meal times is admirable; and his pertinacity in jumping on people's shoulders, till they give him some of the best of what is going, indicates great firmness.

## TO HIS YOUNGEST DAUGHTER

HODESLEA, EASTBOURNE, *Jan. 8, 1893.*

I wish you would write seriously to M——. She is not behaving well to Oliver. I have seen handsomer kittens, but few more lively, and energetically destructive. Just now he scratched away at something that M—— says cost 13s. 6d. a yard—and reduced more or less of it to combings.

M—— therefore excludes him from the dining-room, and all those opportunities of higher education which he would naturally have in *my* house.

I have argued that it is as immoral to place 13s. 6d. a yardnesses within reach of kittens as to hang bracelets and diamond rings in the front garden. But in vain. Oliver is banished—and the protector (not Oliver) is sat upon.—In truth and justice aid your Pa.

[This letter is embellished with fancy portraits of

Oliver when most quiescent (tail up; ready for action).

O. as polisher (tearing at the table leg).

O. as plate basket investigator.

O. as gardener (destroying plants in a pot).

O. as stocking knitter (a wild tangle of cat and wool).

O. as political economist making good for trade at 13s. 6d. a yard (pulling at a hassock).]

The following to Sir John Evans refers to a piece of temporary forgetfulness.

HODESLEA, EASTBOURNE, *March 19, 1893.*

MY DEAR EVANS—It is curious what a difference there is between intentions and acts, especially in the matter of sending cheques. The moment I saw the project of the Lawes and Gilbert testimonial in the *Times*, I sent my contribution in imagination—and it is only the arrival of this circular which has waked me up to the necessity of supplementing my ideal cheque by the real one inclosed.—Ever yours very faithfully,

T. H. HUXLEY.

Reference has been made to the writing of the Romanes Lecture in 1892. Mr. Gladstone had already consented to deliver the first lecture in that year; and early in the summer Professor Romanes sounded Huxley to find out



whether he would undertake the second lecture for 1893. Huxley suggested a possible bar in his precarious health; but subject to this possibility, if the Vice-Chancellor did not regard it as a complete disability, was willing to accept a formal invitation.

Professor Romanes reassured him upon this point, and further begged him, if possible, to be ready to step into the breach if Mr. Gladstone should be prevented from lecturing in the following autumn. The situation became irresistible, and the second of the following letters to Mr. Romanes displays no more hesitation.

#### TO PROFESSOR ROMANES

HODESLEA, *June 3, 1892.*

I should have written to you yesterday, but the book did not arrive till this morning. Very many thanks for it. It looks appetising, and I look forward to the next course.

As to the Oxford lecture, "Verily, thou almost persuadest me," though I thought I had finished lecturing. I really should like to do it; but I have a scruple about accepting an engagement of this important kind, which I might not be able to fulfil.

I am astonishingly restored, and have not had a trace of heart trouble for months. But I am quite aware that I am, physically speaking, on good behaviour—and maintain my condition only by taking an amount of care which is very distasteful to me.

Furthermore, my wife's health is, I am sorry to say, extremely precarious. She was very ill a fortnight ago, and to my very great regret, as well as hers, we are obliged to give up our intended visit to Balliol to-morrow. She is quite unfit to travel, and I cannot leave her here alone for three days.

I think the state of affairs ought to be clear to the Vice-Chancellor. If, in his judgment, it constitutes no hindrance, and he does me the honour to send the invitation, I shall accept it.

#### TO THE SAME

HODESLEA, *June 7, 1892.*

I am afraid that age hath not altogether cleared the spirit of mischief out of my blood; and there is something so piquant in the notion of my acting as substitute for Gladstone that I will be ready if necessity arises.

Of course I will keep absolutely clear of Theology. But I have long had fermenting in my head, some notions about the relations of Ethics and Evolution (or rather the absence of such as are commonly supposed), which I think will be interesting to such an audience as I may expect. "Without prejudice," as the lawyers say, that is the sort of topic that occurs to me.

### TO THE SAME

HODESLEA, *Oct.* 30, 1892.

I had to go to London in the middle of last week about the Gresham University business, and I trust I have put a very long nail into the coffin of that scheme. For which good service you will forgive my delay in replying to your letter. I read all about your show—why not call it "George's Gorgeous," *tout court*?

I should think that there is no living man, who, on such an occasion, could intend and contrive to say so much and so well (in form) without ever rising above the level of antiquarian gossip.

My lecture would have been ready if the G.O.M. had failed you, but I am very glad to have six months' respite, as I now shall be able to write and rewrite it to my heart's content.

I will follow the Gladstonian precedent touching cap and gown—but I trust the Vice-Chancellor will not ask me to take part in a "Church Parade" and read the lessons. I couldn't—really.

As to the financial part of the business, to tell you the honest truth, I would much rather not be paid at all for a piece of work of this kind. I am no more averse to turning an honest penny by my brains than any one else in the ordinary course of things—quite the contrary; but this is not an ordinary occasion. However, this is a pure matter of taste, and I do not want to set a precedent which might be inconvenient to other people—so I agree to what you propose.

By the way, is there any type-writer who is to be trusted in Oxford? Some time ago I sent a MS. to a London type-writer, and to my great disgust I shortly afterwards saw an announcement that I was engaged on the topic.

On the following day he writes to his wife, who was staying with her youngest daughter in town:—

The Vice-Chancellor has written to me and I have fixed May—exact day by and by. Mrs. Romanes has written a crispy little

letter to remind us of our promise to go there, and I have chirruped back.

The "chirrup" ran as follows:—

HODESLEA, *Nov.* 1, 1892.

MY DEAR MRS. ROMANES—I have just written to the Vice-Chancellor to say that I hope to be at his disposition any time next May.

My wife is "larking"—I am sorry to use such a word, but what she is pleased to tell me of her doings leaves me no alternative—in London, whither I go on Thursday to fetch her back—in chains, if necessary. But I know, in the matter of being "taken in and done for" by your hospitable selves, I may, for once, speak for her as well as myself.

Don't ask anybody above the rank of a younger son of a Peer—because I shall not be able to go in to dinner before him or her—and that part of my dignity is naturally what I prize most.

Would you not like me to come in my P.C. suit? All ablaze with gold, and costing a sum with which I could buy oh! so many books!

Only if your late experiences should prompt you to instruct your other guests not to contradict me—don't. I rather like it.—Ever yours very faithfully,

T. H. HUXLEY.

*Bon Voyage!* You can tell Mr. Jones \* that I will have him brought before the Privy Council and fined, as in the good old days, if he does not treat you properly.

This letter was afterwards published in Mrs. Romanes' Life of her husband, and three letters on that occasion, and particularly that in which Huxley tried to guard her from any malicious interpretation of his jests, are to be found on p. 403.

On the afternoon of May 18, 1893, he delivered at Oxford his Romanes Lecture, on "Evolution and Ethics," a study of the relation of ethical and evolutionary theory in the history of philosophy, the text of which is that while morality is necessarily a part of the order of nature, still the ethical principle is opposed to the self-regarding principle on which cosmic evolution has taken place. Society is a

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\* The hotel-keeper in Madeira.

part of nature, but would be dissolved by a return to the natural state of simple warfare among individuals. It follows that ethical systems based on the principles of cosmic evolution are not logically sound. A study of the essays of the foregoing ten years will show that he had more than once enunciated this thesis, and it had been one of the grounds of his long-standing criticism of Mr. Spencer's system.

Nevertheless, the doctrine seemed to take almost everybody by surprise. The drift of the lecture was equally misunderstood by critics of opposite camps. Huxley was popularly supposed to hold the same views as Mr. Spencer—for were they not both Evolutionists? On general attention being called to the existing difference between their views, some jumped to the conclusion that Huxley was offering a general recantation of evolution, others that he had discarded his former theories of ethics. On the one hand he was branded as a deserter from free thought; on the other, hailed almost as a convert to orthodoxy. It was irritating, but little more than he had expected. The conditions of the lecture forbade any reference to politics or religion; hence much had to be left unsaid, which was supplied next year in the *Prolegomena* prefacing the re-issue of the lecture.

After all possible trimming and compression, he still feared the lecture would be too long, and would take more than an hour to deliver, especially if the audience was likely to be large, for the numbers must be considered in reference to the speed of speaking. But he had taken even more pains than usual with it. "The Lecture," he writes to Professor Romanes on April 19, "has been in type for weeks, if not months, as I have been taking an immensity of trouble over it. And I can judge of nothing till it is in type." But this very precaution led to unexpected complications. When the proposition to lecture was first made to him, he was not sent a copy of the statute ordering that publication in the first instance should lie with the University Press; and in view of the proviso that "the Lecturer is free to publish on his own behalf in any other form he may like," he had taken Prof. Romanes' original reference to publication by the











Press to be a subsidiary request to which he gladly assented. However, a satisfactory arrangement was speedily arrived at with the publishers; Huxley remarking:—

“All I have to say is, do not let the University be in any way a loser by the change. If the V.-C. thinks there is any risk of this, I will gladly add to what Macmillan pays. That matter can be settled between us.”

However, he had not forgotten the limitation of his subject in respect of religion and politics, and he repeatedly refers to his careful avoidance of these topics as an “egg-dance.” And wishing to reassure Mr. Romanes on this head, he writes on April 22:—

There is no allusion to politics in my lecture, nor to any religion except Buddhism, and only to the speculative and ethical side of that. If people apply anything I say about these matters to modern philosophies, except evolutionary speculation, and religions, that is not my affair. To be honest, however, unless I thought they would, I should never have taken all the pains I have bestowed on these 36 pages.

But these words conjured up terrible possibilities, and Mr. Romanes wrote back in great alarm to ask the exact state of the case. The two following letters show that the alarm was groundless:—

HODESLEA, *April 26, 1893.*

MY DEAR ROMANES—I fear, or rather hope, that I have given you a very unnecessary scare.

You may be quite sure, I think, that, while I should have refused to give the lecture if any pledge of a special character had been proposed to me, I have felt very strongly bound to you to take the utmost care that no shadow of a just cause for offence should be given, even to the most orthodox of Dons.

It seems to me that the best thing I can do is to send you the lecture as it stands, notes and all. But please return it within two days at furthest, and consider it *strictly confidential* between us two (I am not excluding Mrs. Romanes, if she cares to look at the paper). No consideration would induce me to give any ground for the notion that I had submitted the lecture to anyone but yourself.

If there is any phrase in the lecture which you think likely to get you into trouble, out it shall come or be modified in form.

If the whole thing is too much for the Dons' nerves—I am no judge of their delicacy—I am quite ready to give up the lecture.

In fact I do not know whether I shall be able to make myself heard three weeks hence, as the influenza has left its mark in hoarseness and pain in the throat after speaking.

So you see if the thing is altogether too wicked there is an easy way out of it.—Ever yours very faithfully,

T. H. HUXLEY.

HODESLEA, *April 28, 1893.*

MY DEAR ROMANES—My mind is made easy by such a handsome acquittal from you and the Lady Abbess, your coadjutor in the Holy Office.

My wife, who is my inquisitor and confessor in ordinary, has gone over the lecture twice, without scenting a heresy, and if she and Mrs. Romanes fail—a fico for a mere male don's nose!

From the point of view of the complete argument, I agree with you about note 19. But the dangers of open collision with orthodoxy on the one hand and Spencer on the other, increased with the square of the enlargement of the final pages, and I was most anxious for giving no handle to anyone who might like to say I had used the lecture for purposes of attack. Moreover, in spite of all reduction, the lecture is too long already.

But I think it not improbable that in spite of my meekness and peacefulness, neither the one side nor the other will let me alone. And then you see, I shall have an opportunity of making things plain, under no restriction. You will not be responsible for anything said in the second edition, nor can the Donniest of Dons grumble.—Ever yours very faithfully,

T. H. HUXLEY.

The double negative is Shakspearian. See Hamlet, act ii. sc. 2.

Unfortunately for the entire success of the lecture, he was suffering from the results of influenza, more especially a loss of voice. He writes (April 18):—

After getting through the winter successfully I have had the ill-fortune to be seized with influenza. I believe I must have got it from the microbes haunting some of the three hundred doctors at the Virchow dinner.\*

---

\* On the 16th March.

I had next to no symptoms except debility, and though I am much better I cannot quite shake that off. As usual with me it affects my voice. I hope this will get right before this day month, but I expect I shall have to nurse it. I do not want to interfere with any of your hospitable plans, and I think if you will ensure me quiet on the morning of the 18th (I understand the lecture is in the afternoon) it will suffice. After the thing is over I am ready for anything from pitch and toss onwards.

Two more letters dated before the 18th of May touch on the circumstances of the lecture. One is to his son-in-law, John Collier; the other to his old friend Tyndall, the last he ever wrote him, and containing a cheery reference to the advance of old age.

HODESLEA, EASTBOURNE, *May 9, 1893.*

MY DEAR JACK— . . . M— is better, and I am getting my voice back. But may St. Ernulphus' curse descend on influenza microbes! They tried to work their way out at my nose, and converted me into a disreputable Captain Costigan-looking person ten days ago. Now they are working at my lips.

For the credit of the family I hope I shall be more reputable by the 18th.

I hope you will appreciate my dexterity. The lecture is a regular egg-dance. That I should discourse on Ethics to the University of Oxford and say all I want to say, without a word anybody can quarrel with, is decidedly the most piquant occurrence in my career. . . .—Ever yours affectionately,

PATER.

*P.S. to be read first.*

EASTBOURNE, *May 15, 1893.*

MY DEAR TYNDALL—There are not many apples (and those mostly of the crab sort) left upon the old tree, but I send you the product of the last shaking. Please keep it out of any hands but your wife's and yours till Thursday, when I am to "stand and deliver" it, if I have voice enough, which is doubtful. The sequelæ of influenza in my case have been mostly pimples and procrastination, the former largely on my nose, so that I have been a spectacle. Besides these, loss of voice. The pimples are mostly gone and the procrastination is not much above normal, but what will happen when I try to fill the Sheldonian Theatre is very doubtful.

Who would have thought thirty-three years ago, when the great "Sammy" fight came off, that the next time I should

speaking at Oxford would be in succession to Gladstone, on "Evolution and Ethics" as an invited lecturer?

There was something so quaint about the affair that I really could not resist, though the wisdom of putting so much strain on my creaky timbers is very questionable. Mind you wish me well through it at 2.30 on Thursday.

I wish we could have better news of you. As to dying by inches, that is what we are all doing, my dear old fellow; the only thing is to establish a proper ratio between inch and time. Eight years ago I had good reason to say the same thing of myself, but my inch has lengthened out in a most extraordinary way. Still I confess we are getting older; and my dear wife has been greatly shaken by repeated attacks of violent pain which seizes her quite unexpectedly. I am always glad, both on her account and my own, to get back into the quiet and good air here as fast as possible, and in another year or two, if I live so long, I shall clear out of all engagements that take me away. . . .

T. H. HUXLEY.

*Not to be answered*, and you had better get Mrs. Tyndall to read it to you or you will say naughty words about the scrawl.

Sanguine as he had resolved to be about the recovery of his voice, his fear lest "1000 out of the 2000 won't hear" was very near realisation. The Sheldonian Theatre was thronged before he appeared on the platform, a striking presence in his D.C.L. robes, and looking very leonine with his long silvery gray hair sweeping back in one long wave from his forehead, and the rugged squareness of his features tempered by the benignity of an old age which has seen much and overcome much. He read the lecture from a printed copy, not venturing, as he would have liked, upon the severe task of speaking it from memory, considering its length and the importance of preserving the exact wording. He began in a somewhat low tone, nursing his voice for the second half of the discourse. From the more distant parts of the theatre came several cries of "speak up"; and after a time a rather disturbing migration of eager undergraduates began from the galleries to the body of the hall. The latter part was indeed more audible than the first; still a number of the audience were disappointed in hearing imperfectly. However, the lecture had a large sale; the first

edition of 2000 was exhausted by the end of the month; and another 700 in the next ten days.

After leaving Oxford, and paying a pleasant visit to one of the Fannings (his wife's nephew) at Tew, Huxley intended to visit another of the family, Mrs. Crowder, in Lincolnshire, but on reaching London found himself dead beat and had to retire to Eastbourne, whence he writes to Sir M. Foster and to Mr. Romanes.

HODESLEA, *May 26, 1893.*

MY DEAR FOSTER—YOUR letter has been following me about. I had not got rid of my influenza at Oxford, so the exertion and the dinner parties together played the deuce with me.

We had got so far as the Great Northern Hotel on our way to some connections in Lincolnshire, when I had to give it up and retreat here to begin convalescing again.

I do not feel sure of coming to the Harvey affair after all. But if I do, it will be alone, and I think I had better accept the hospitality of the college; which will by no means be so jolly as Shelford, but probably more prudent, considering the necessity of dining out.

The fact is, my dear friend, I am getting old.

I am very sorry to hear you have been doing your influenza also. It's a beastly thing, as I have it, no symptoms except going flop.—Ever yours,

T. H. HUXLEY.

Nobody sees that the lecture is a very orthodox production on the text (if there is such a one), "Satan the Prince of this world."

I think the remnant of influenza microbes must have held a meeting in my *corpus* after the lecture, and resolved to reconquer the territory. But I mean to beat the brutes.

"I shall be interested," he writes to Mr. Romanes, "in the article on the lecture. The papers have been asinine." This was an article which Mr. Romanes had told him was about to appear in the *Oxford Magazine*. And on the 30th he writes again:—

Many thanks for the *Oxford Magazine*. The writer of the article is about the only critic I have met with yet who understands my drift. My wife says it is a "sensible" article, but her classification is a very simple one—sensible articles are those

that contain praise, "stupid" those that show insensibility to my merits!

Really I thought it very sensible, without regard to the plums in the pudding.

But the criticism, "sensible" not merely in the humorous sense, which he most fully appreciated was that of Professor Seth, in a lecture entitled "Man and Nature." He wrote to him on October 27:—

DEAR PROFESSOR SETH—A report of your lecture on "Man and Nature" has just reached me. Accept my cordial thanks for defending me, and still more for understanding me.

I really have been unable to understand what my critics have been dreaming of when they raise the objection that the ethical process being part of the cosmic process cannot be opposed to it.

They might as well say that artifice does not oppose nature, because it is a part of nature in the broadest sense.

However, it is one of the conditions of the "Romanes Lecture" that no allusion shall be made to religion or politics. I had to make my omelette without breaking any of those eggs, and the task was not easy.

The prince of scientific expositors, Faraday, was once asked, "How much may a popular lecturer suppose his audience knows?" He replied emphatically, "*Nothing.*" Mine was not exactly a popular audience, but I ought not to have forgotten Faraday's rule.—Yours very faithfully,

T. H. HUXLEY.

A letter of congratulation to Lord Farrer on his elevation to the peerage contains an ironical reference to the general tone of the criticisms on his lecture:—

HODESLEA, *June 5, 1893.*

CI DEVANT CITOYEN PÉTION (autrefois le vertueux)—You have lost all chance of leading the forces of the County Council to the attack of the Horse-Guards.

You will become an émigré, and John Burns will have to content himself with the heads of the likes of me. As the Jacobins said of Lavoisier, the Republic has no need of men of science.

But this prospect need not interfere with sending our hearty congratulations to Lady Farrer and yourself.

As for your criticisms, don't you know that I am become a reactionary and secret friend of the clerics?

My lecture is really an effort to put the Christian doctrine that Satan is the Prince of this world upon a scientific foundation.

Just consider it in this light, and you will understand why I was so warmly welcomed in Oxford. (N.B.—The only time I spoke before was in 1860, when the great row with Samuel came off!!)—Ever yours very faithfully,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *July 15, 1893.*

MY DEAR SKELTON—I fear I must admit that even a Gladstonian paper occasionally tells the truth. They never mean to, but we all have our lapses from the rule of life we have laid down for ourselves, and must be charitable.

The fact is, I got influenza in the spring, and have never managed to shake right again, any tendency that way being well counteracted by the Romanes lecture and its accompaniments.

So we are off to the Maloja to-morrow. It mended up the shaky old heart-pump five years ago, and I hope will again.

I have been in Orkney, and believe in the air, but I cannot say quite so much for the scenery. I thought it just a wee little bit, shall I say, bare? But then I have a passion for mountains.

I shall be right glad to know what your H.O.M.\* has to say about Ethics and Evolution. You must remember that my lecture was a kind of egg-dance. Good manners bound me over to say nothing offensive to the Christians in the amphitheatre (I was in the arena), and truthfulness, on the other hand, bound me to say nothing that I did not fully mean. Under these circumstances one has to leave a great many i's undotted and t's uncrossed.

Pray remember me very kindly to Mrs. Skelton, and believe me—Yours ever,

T. H. HUXLEY.

And again on Oct. 17:—

Ask your Old Man of Hoy to be so good as to suspend judgment until the Lecture appears again with an appendix in that collection of volumes the bulk of which appals me.

Didn't I see somewhere that you had been made Poor Law

---

\* The "Old Man of Hoy," a pseudonym under which Sir J. Skelton wrote.

pope, or something of the sort? I congratulate the poor more than I do you, for it must be a weary business trying to mend the irremediable. (No, I am *not* glancing at the whitewashing of Mary.)

Here may be added two later letters bearing in part upon the same subject:—

HODESLEA, EASTBOURNE, *March 23, 1894.*

DEAR SIR—I ought to have thanked you before now for your letter about Nietzsche's works, but I have not much working time, and I find letter-writing a burden, which I am always trying to shirk.

I will look up Nietzsche's, though I must confess that the profit I obtain from German authors on speculative questions is not usually great.

As men of research in positive science they are magnificently laborious and accurate. But most of them have no notion of style, and seem to compose their books with a pitchfork.

There are two very different questions which people fail to discriminate. One is whether evolution accounts for morality, the other whether the principle of evolution in general can be adopted as an ethical principle.

The first, of course, I advocate, and have constantly insisted upon. The second I deny, and reject all so-called evolutionary ethics based upon it.—I am yours faithfully,

T. H. HUXLEY.

Thomas Common, Esq.

HODESLEA, *August 31, 1894.*

DEAR PROFESSOR SETH—I have come to a stop in the issue of my essays for the present, and I venture to ask your acceptance of the set which I have desired my publishers to send you.

I hope that at present you are away somewhere, reading novels or otherwise idling, in whatever may be your pet fashion.

But some day I want you to read the "Prolegomena" to the reprinted Romanes Lecture.

Lately I have been re-reading Spinoza (much read and little understood in my youth).

But that noblest of Jews must have planted no end of germs in my brains, for I see that what I have to say is in principle what he had to say, in modern language.—Ever yours very faithfully,

T. H. HUXLEY.



The following letters with reference to the long unfinished memoir on "Spirula" for the *Challenger* reports tell their own story. Huxley was very glad to find some competent person to finish the work which his illness had incapacitated him from completing himself. It had been a burden on his conscience; and now he gladly put all his plates and experience at the disposal of Professor Pelseener, though he had nothing written and would not write anything. He had no wish to claim even joint authorship for the completed paper; when the question was first raised, he desired merely that it should be stated that such and such drawings were made by him; but when Professor Pelseener insisted that both names should appear as joint authors, he consented to this solution of the question.

HODESLEA, Sept. 17, 1893.

DEAR MR. MURRAY\*—If the plates of *Spirula* could be turned to account a great burthen would be taken off my mind.

Professor Pelseener is every way competent to do justice to the subject; and he has just what I needed, namely another specimen to check and complete the work; and besides that, the physical capacity for dissection and close observation, of which I have had nothing left since my long illness.

Will you be so good as to tell Professor Pelseener that I shall be glad to place the plates at his disposal and to give him all the explanations I can of the drawings, whenever it may suit his convenience to take up the work?

Nothing beyond mere fragments remained of the specimen.—I am, yours very faithfully,

T. H. HUXLEY.

I return Pelseener's letter.

HODESLEA, Sept. 30, 1893.

DEAR PROFESSOR PELSEENER—I send herewith (by this post) a full explanation of the plates of *Spirula* (including those of which you have unlettered copies). I trust you will not be too much embarrassed by my bad handwriting, which is a plague to myself as well as to other people.

My hope is that you will be good enough to consider these figures as materials placed in your hands, to be made useful in the memoir on *Spirula*, which I trust you will draw up, supplying the defects of my work and checking its accuracy.

---

\* Now K.C.B.; Director of the "Reports of the *Challenger*."

You will observe that a great deal remains to be done. The muscular system is untouched; the structure and nature of the terminal circumvallate papilla have to be made out; the lingual teeth must be re-examined; and the characters of the male determined. If I recollect rightly, Owen published something about the last point.

If I can be of any service to you in any questions that arise, I shall be very glad; but as I am putting the trouble of the work on your shoulders, I wish you to have the credit of it.

So far as I am concerned, all that is needful is to say that such and such drawings were made by me.—Ever yours very faithfully,  
T. H. HUXLEY.

HODESLEA, *Oct.* 12, 1893.

DEAR PROFESSOR PELSENER—I am very glad to hear from you that the homology of the cephalopod arms with the gastropod foot is now generally admitted. When I advocated that opinion in my memoir on the "Morphology of the Cephalous Mollusca," some forty years ago, it was thought a great heresy.

As to publication; I am quite willing to agree to whatever arrangement you think desirable, so long as you are kind enough to take all trouble (but that of "consulting physician") off my shoulders. Perhaps putting both names to the memoir, as you suggest, will be the best way. I cannot undertake to write anything, but if you think I can be of any use as an adviser or critic, do not hesitate to demand my services.—Ever yours very faithfully,  
T. H. HUXLEY.

Although in February he had stayed several days in town with the Donnellys, who "take as much care of me as if I were a piece of old china," and had attended a levée and a meeting of his London University Association, had listened with interest to a lecture of Professor Dewar, who "made liquid oxygen by the pint," and dined at Marlborough House, the influenza had prevented him during the spring from fulfilling several engagements in London; but after his return from Oxford he began to recruit in the fine weather, and found delightful occupation in putting up a rockery in the garden for his pet Alpine plants.

In mid June he writes to his wife, then on a visit to one of her daughters:—

What a little goose you are to go having bad dreams about me—who am like a stalled ox—browsing in idle comfort—in fact, idle is no word for it. Sloth is the right epithet. I can't get myself to do anything but potter in the garden, which is looking lovely.

On June 21 he went to Cambridge for the Harvey Celebration at Gonville and Caius College, and made a short speech.

The dinner last night (he writes) was a long affair, and I was the last speaker; but I got through my speech very well, and was heard by everybody, I am told.

But as is the way with influenza, it was thrown off in the summer only to return the next winter, and on the eve of the Royal Society Anniversary Dinner he writes to Sir M. Foster:—

I am in rather a shaky and voiceless condition, and unless I am more up to the mark to-morrow morning I shall have to forego the dinner, and, what is worse, the chat with you afterwards.

One consequence of the spring attack of influenza was that this year he went once more to the Maloja, staying there from July 21 to August 25.

HODESLEA, EASTBOURNE, *July 9, 1893.*

MY DEAR HOOKER—What has happened to the *x* meeting you proposed? However, it does not matter much to me now, as Hames, who gave me a thorough overhauling in London, has packed me off to the Maloja again, and we start, if we can, on the 17th.

It is a great nuisance, but the dregs of influenza and the hot weather between them have brought the weakness of my heart to the front, and I am gravitating to the condition in which I was five or six years ago. So I must try the remedy which was so effectual last time.

We are neither of us very fit, and shall have to be taken charge of by a courier. Fancy coming to that!

Let me be a warning to you, my dear old man. Don't go giving lectures at Oxford and making speeches at Cambridge, and above all things don't, oh don't go getting influenza, the

microbes of which would be seen under a strong enough microscope to have this form.

[Sketch of an active little black demon.]

T. H. HUXLEY.

Though not so strikingly as before, the high Alpine air was again a wonderful tonic to him. His diary still contains a note of occasional long walks; and once more he was the centre of a circle of friends, whose cordial recollections of their pleasant intercourse afterwards found expression in a lasting memorial. Beside one of his favourite walks, a narrow pathway skirting the blue lakelet of Sils, was placed a gray block of granite. The face of this was roughly smoothed, and upon it was cut the following inscription:—

In memory of the illustrious English Writer and Naturalist, Thomas Henry Huxley, who spent many summers at the Kur-saal, Maloja.

In a letter to Sir J. Hooker, of October 1, he describes the effects of his trip, and his own surprise at being asked to write a critical account of Owen's work:—

HODESLEA, EASTBOURNE, *Oct. 1, 1893.*

MY DEAR HOOKER—I am no better than a Gadarene swine for not writing to you from the Maloja, but I was too procrastinatingly lazy to expend even that amount of energy. I found I could walk as well as ever, but unless I was walking I was everlastingly seedy, and the wife was unwell almost all the time. I am inclined to think that it is coming home which is the most beneficial part of going abroad, for I am remarkably well now, and my wife is very much better.

I trust the impaled and injudicious Richard\* is none the worse. It is wonderful what boys go through (also what goes through them).

You will get all the volumes of my screeds. I was horrified to find what a lot of stuff there was—but don't acknowledge them unless the spirit moves you. . . . I think that on *Natural Inequality of Man* will be to your taste.

Three, or thirty, guesses and you shall not guess what I am about to tell you.

---

\* Sir J. Hooker's youngest son, who had managed to spike himself on a fence.

Rev. Richard Owen has written to me to ask me to write a concluding chapter for the biography of his grandfather—containing a “critical” estimate of him and his work!!! Says he is moved thereto by my speech at the meeting for a memorial.

There seemed nothing for me to do but to accept as far as the scientific work goes. I declined any personal estimate on the ground that we had met in private society half a dozen times.

If you don't mind being bothered I should like to send you what I write and have your opinion about it.

You see Jowett is going or gone. I am very sorry we were obliged to give up our annual visit to him this year. But I was quite unable to stand the exertion, even if Hames had not packed me off. How one's old friends are dropping!

Romanes gave me a pitiable account of himself in a letter the other day. He has had an attack of hemiplegic paralysis, and tells me he is a mere wreck. That means that the worst anticipations of his case are being verified. It is lamentable.

Take care of yourself, my dear old friend, and with our love to you both, believe me, ever yours,  
T. H. HUXLEY.

Not long after his return he received a letter from a certain G—— S——, who wrote from Southampton detailing a number of observations he had made upon the organisms to be seen with a magnifying glass in an infusion of vegetable matter, and as “an ignoramus,” apologised for any appearance of conceit in so doing, while asking his advice as to the best means of improving his scientific knowledge. Huxley was much struck by the tone of the letter and the description of the experiments, and he wrote back:—

HODESLEA, *Nov.* 9, 1893.

SIR—We are all “ignoramuses” more or less—and cannot reproach one another. If there were any sign of conceit in your letter, you would not get this reply.

On the contrary, it pleases me. Your observations are quite accurate and clearly described—and to be accurate in observation and clear in description is the first step towards good scientific work.

You are seeing just what the first workers with the microscope saw a couple of centuries ago.

Get some such book as Carpenter's “On the Microscope” and you will see what it all means.

Are there no science classes in Southampton? There used to be, and I suppose is, a Hartley Institute.

If you want to consult books you cannot otherwise obtain, take this to the librarian, give him my compliments, and say I should be very much obliged if he would help you.—I am, yours very faithfully,

T. H. HUXLEY.

Great was Huxley's astonishment when he learned in reply that his correspondent was a casual dock labourer, and had but scanty hours of leisure in which to read and think and seek into the recesses of nature, while his means of observation consisted of a toy microscope bought for a shilling at a fair. Casting about for some means of lending the man a helping hand, he bethought him of the Science and Art Department, and wrote on December 30 to Sir J. Donnelly:—

The Department has feelers all over England—has it any at Southampton? And if it has, could it find out something about the writer of the letters I enclose? For a "casual docker" they are remarkable; and I think when you have read them you will not mind my bothering you with them. (I really have had the grace to hesitate.)

I have been puzzled what to do for the man. It is so much easier to do harm than good by meddling—and yet I don't like to leave him to "casual docking."

In that first letter he has got—on his own hook—about as far as Buffon and Needham 150 years ago.

And later to Professor Howes:—

HODESLEA, EASTBOURNE, *Fcb.* 12, 1894.

MY DEAR HOWES—Best thanks for unearthing the volumes of Milne-Edwards. I was afraid my set was spoiled.

I shall be still more obliged to you if you can hear of something for S—. There is a right good parson in his neighbourhood, and from what he tells me about S— I am confirmed in my opinion that he is a very exceptional man, who ought to be at something better than porter's work for twelve hours a day.

The mischief is that one never knows how transplanting a tree, much less a man, will answer. Playing Providence is a game at which one is very apt to burn one's fingers.

However, I am going to try, and hope at any rate to do no harm to the man I want to help.—Ever yours very faithfully,

T. H. HUXLEY.

He was eventually offered more congenial occupation at the Natural History Museum in South Kensington, but preferred not to enter into the bonds of an unaccustomed office.

Meanwhile, through Sir John Donnelly, Huxley was placed in communication with the Rev. Montague Powell, who, at his request, called upon the docker; and finding him a man who had read and thought to an astonishing extent upon scientific problems, and had a considerable acquaintance with English literature, soon took more than a vicarious interest in him. Mr. Powell, who kept Huxley informed of his talks and correspondence with G. S., gives a full account of the circumstances in a letter to the *Spectator* of July 13, 1895, from which I quote the following words:—

The Professor's object in writing was to ask me how best such a man could be helped, I being at his special request the intermediary. So I suggested in the meanwhile a microscope and a few scientific books. In the course of a few days I received a splendid achromatic compound microscope and some books, which I duly handed over to my friend, telling him it was from an unknown hand. "Ah," he said, "I know who that must be; it can be no other than the greatest of living scientists; it is just like him to help a tyro."

One small incident of this affair is perhaps worth preserving as an example of Huxley's love of a bantering repartee. In the midst of the correspondence Mr. Powell seems suddenly to have been seized by an uneasy recollection that Huxley had lately received some honour or title, so he next addressed him as "My dear Sir Thomas." The latter, not to be outdone, promptly replied with "My dear Lord Bishop of the Solent."

About the same time comes a letter to Mr. Knowles, based upon a paragraph from the gossiping column of some newspaper which had come into Huxley's hands:—

HODESLEA, EASTBOURNE, Nov. 9, 1893.

*Gossip of the Town.*

“Professor Huxley receives 200 guineas for each of his articles for the *Nineteenth Century*.”

MY DEAR KNOWLES—I have always been satisfied with the *Nineteenth Century* in the capacity of paymaster, but I did not know how much reason I had for my satisfaction till I read the above!

Totting up the number of articles and multiplying by 200 it strikes me I shall be behaving very handsomely if I take £2000 for the balance due.

So sit down quickly, take thy cheque-book, and write five score, and let me have it at breakfast time to-morrow. I once got a cheque for £1000 at breakfast, and it ruined me morally. I have always been looking out for another.

I hope you are all flourishing. We are the better for Maloja, but more dependent on change of weather and other trifles than could be wished. Yet I find myself outlasting those who started in life along with me. Poor Andrew Clark and I were at Haslar together in 1846, and he was the younger by a year and a half.  
—Ever yours very faithfully, T. H. HUXLEY.

All my time is spent in the co-ordination of my eruptions when I am an active volcano.

I hope you got the volumes which I told Macmillan to send you.

The following letter to Professor Romanes, whose failing eyesight was a premonitory symptom of the disease which proved fatal the next year, reads, so to say, as a solemn prelude to the death of three old friends this autumn—of Andrew Clark, his old comrade at Haslar, and cheery physician for many years; of Benjamin Jowett, Master of Balliol, whose acquaintance he had first made in 1851 at the Stanleys' at Harrow, and with whom he kept up an intimacy to the end of his life, visiting Balliol once or twice every year; and, heaviest blow, of John Tyndall, the friend and comrade whose genial warmth of spirit made him almost claim a brother's place in early struggles and later success, and whose sudden death was all the more poignant for the cruel touch of tragedy in the manner of it:—



HODESLEA, *Sept.* 28, 1893.

MY DEAR ROMANES—We are very much grieved to hear such a bad account of your health. Would that we could achieve something more to the purpose than assuring you and Mrs. Romanes of our hearty sympathy with you both in your troubles. I assure you, you are much in our thoughts, which are sad enough with the news of Jowett's, I fear, fatal attack.

I am almost ashamed to be well and tolerably active when young and old friends are being thus prostrated.

However, you have youth on your side, so do not give up, and wearisome as doing nothing may be, persist in it as the best of medicines.

At my time of life one should be always ready to stand at attention when the order to march comes; but for the rest I think it well to go on doing what I can, as if F. M. General Death had forgotten me. That must account for my seeming presumption in thinking I may some day "take up the threads" of late evolutionary speculation.—Ever yours very faithfully,

T. H. HUXLEY.

My wife joins with me in love and kind wishes to you both.

At the request of his friends, Huxley wrote for the *Nineteenth Century* a brief appreciation of his old comrade Tyndall—the tribute of a friend to a friend—and, difficult task though it was, touched on the closing scene, if only from a chivalrous desire to do justice to the long devotion which accident had so cruelly wronged:—

I am comforted (he writes to Sir J. Hooker on January 3) by your liking the Tyndall article. You are quite right, I shivered over the episode of the "last words," but it struck me as the best way of getting justice done to her, so I took a header. I am glad to see by the newspaper comments that it does not seem to have shocked other people's sense of decency.

The funeral took place on Saturday, December 9. There was no storm nor fog to make the graveside perilous for the survivors. In the Haslemere churchyard the winter sun shone its brightest, and the moorland air was crisp with an almost Alpine freshness as this lover of the mountains was carried to his last resting-place. But though he took no outward harm from that bright still morning, Huxley was

greatly shaken by the event: "I was very much used up," he writes to Sir M. Foster on his return home two days later, "to my shame be it said, far more than my wife;" and on December 30 to Sir John Donnelly:—

Your kind letter deserved better than to have been left all this time without response, but the fact is, I came to grief the day after Christmas Day (no, we did *not* indulge in too much champagne). Lost my voice, and collapsed generally, without any particular reason, so I went to bed and stayed there as long as I could stand it, and now I am picking up again. The fact is, I suppose I had been running up a little account over poor old Tyndall. One does not stand that sort of wear and tear so well as one gets ancient.

On the same day he writes to Sir J. D. Hooker:—

HODESLEA, EASTBOURNE, *Dec. 30, 1893.*

MY DEAR HOOKER—You gave the geographers some uncommonly sane advice. I observe that the words about the "stupendous ice-clad mountains" you saw were hardly out of your mouth when — coolly asserts that the Antarctic continent is a table-land! "comparatively level country." It really is wrong that men should be allowed to go about loose who fill you with such a strong desire to kick them as that little man does.

I send herewith a spare copy of *Nineteenth* with my paper about Tyndall. It is not exactly what I could wish, as I was hurried over it, and knocked up into the bargain, but I have tried to give a fair view of him. Tell me what you think of it.

I have been having a day or two on the sick list. Nothing discernible the matter, only flopped, as I did in the spring. However, I am picking up again. The fact is, I have never any blood pressure to spare, and a small thing humbugs the pump.

However, I have some kicks left in me, *vide* the preface to the fourth vol. of *Essays*; do. No. V. when that appears in February.

Now, my dear old friend, take care of yourself in the coming year '94. I'll stand by you as long as the fates will let me, and you must be equally "Johnnie." With our love to Lady Hooker and yourself—Ever yours affectionately,

T. H. HUXLEY.

## CHAPTER XXII

1894

THE completion early in 1894 of the ninth volume of *Collected Essays* was followed by a review of them in *Nature* (February 1), from the pen of Professor Ray Lankester, emphasising the way in which the writer's personality appears throughout the writing:—

There is probably no lover of apt discourse, of keen criticism, or of scientific doctrine who will not welcome the issue of Professor Huxley's *Essays* in the present convenient shape. For my own part, I know of no writing which by its mere form, even apart from the supreme interest of the matters with which it mostly deals, gives me so much pleasure as that of the author of these essays. In his case, more than that of his contemporaries, it is strictly true that the style is the man. Some authors we may admire for the consummate skill with which they transfer to the reader their thought without allowing him, even for a moment, to be conscious of their personality. In Professor Huxley's work, on the other hand, we never miss his fascinating presence; now he is gravely shaking his head, now compressing the lips with emphasis, and from time to time, with a quiet twinkle of the eye, making unexpected apologies or protesting that he is of a modest and peace-loving nature. At the same time, one becomes accustomed to a rare and delightful phenomenon. Everything which has entered the author's brain by eye or ear, whether of recondite philosophy, biological fact, or political programme, comes out again to us—clarified, sifted, arranged, and vivified by its passage through the logical machine of his strong individuality.

Of the artist in him it continues:—

He deals with form not only as a mechanical engineer *in partibus* (Huxley's own description of himself), but also as an

artist, a born lover of form, a character which others recognise in him though he does not himself set it down in his analysis.

The essay on "Animal Automatism" suggested a reminiscence of Professor Lankester's as to the way in which it was delivered, and this in turn led to Huxley's own account of the incident in the letter given in Vol. I. p. 444.

About the same time there is a letter acknowledging Mr. Bateson's book *On Variation*, which is interesting as touching on the latter-day habit of speculation apart from fact which had begun to prevail in biology:—

HODESLEA, *Feb.* 20, 1894.

MY DEAR MR. BATESON—I have put off thanking you for the volume *On Variation* which you have been so good as to send me in the hope that I should be able to look into it before doing so.

But as I find that impossible, beyond a hasty glance, at present, I must content myself with saying how glad I am to see from that glance that we are getting back from the region of speculation into that of fact again.

There have been threatenings of late that the field of battle of Evolution was being transferred to Nephelococcygia.

I see you are inclined to advocate the possibility of considerable "saltus" on the part of Dame Nature in her variations. I always took the same view, much to Mr. Darwin's disgust, and we used often to debate it.

If you should come across my article in the *Westminster* (1860) you will find a paragraph on that question near the end. I am writing to Macmillan to send you the volume.—Yours very faithfully,

T. H. HUXLEY.

By the way, have you ever considered this point, that the variations of which breeders avail themselves are exactly those which occur when the previously wild stocks are subjected to exactly the same conditions?

The rest of the first half of the year is not eventful. As illustrating the sort of communications which constantly came to him, I quote from a letter to Sir J. Donnelly, of January 11:—

I had a letter from a fellow yesterday morning who must be a lunatic, to the effect that he had been reading my essays, thought I was just the man to spend a month with, and was coming down by the five o'clock train, attended by his seven children and his *mother-in-law*!

Frost being over, there was lots of boiling water ready for him, but he did not turn up!

Wife and servants expected nothing less than assassination.

Later he notes with dismay an invitation as a Privy Councillor to a State evening party:—

It is at 10.30 P.M., just the time this poor old septuagenarian goes to bed.

My swellness is an awful burden, for as it is I am going to dine with the Prime Minister on Saturday.

The banquet with the Prime Minister here alluded to was the occasion of a brief note of apology to Lord Rosebery for having unintentionally kept him waiting:—

HODESLEA, EASTBOURNE, *May 28, 1894.*

DEAR LORD ROSEBERY—I had hoped that my difficulties in dealing with an overtight scabbard stud, as we sat down to dinner on Saturday, had inconvenienced no one but myself, until it flashed across my mind after I had parted from you that, as you had observed them, it was only too probable that I had the misfortune to keep you waiting.

I have been in a state of permanent blush ever since, and I feel sure you will forgive me for troubling you with this apology as the only remedy to which I can look for relief from that unwonted affliction.—I am, dear Lord Rosebery, yours very faithfully,  
T. H. HUXLEY.

All through the spring he had been busy completing the chapter on Sir Richard Owen's work, which he had been asked to write by the biographer of his old opponent, and on February 4 tells Sir J. D. Hooker:—

I am toiling over my chapter about Owen, and I believe his ghost in Hades is grinning over my difficulties.

The thing that strikes me most is, how he and I and all the things we fought about belong to antiquity.

It is almost impertinent to trouble the modern world with such antiquarian business.

He sent the MS. to Sir M. Foster on June 16; the book itself appeared in December. The chapter in question was restricted to a review of the immense amount of work, most valuable on its positive side, done by Owen (compare the letter of January 16, 1893); and the review in *Nature* remarks of it that the criticism is "so straightforward, searching, and honest as to leave nothing further to be desired."

Besides this piece of work, he had written early in the year a few lines on the general character of the nineteenth century, in reply to a request, addressed to "the most illustrious children of the century," for their opinion as to what name will be given to it by an impartial posterity—the century of Comte, of Darwin or Renan, of Edison, Pasteur, or Gladstone. He replied:—

I conceive that the leading characteristic of the nineteenth century has been the rapid growth of the scientific spirit, the consequent application of scientific methods of investigation to all the problems with which the human mind is occupied, and the correlative rejection of traditional beliefs which have proved their incompetence to bear such investigation.

The activity of the scientific spirit has been manifested in every region of speculation and of practice.

Many of the eminent men you mention have been its effective organs in their several departments.

But the selection of any one of these, whatever his merits, as an adequate representative of the power and majesty of the scientific spirit of the age would be a grievous mistake.

Science reckons many prophets, but there is not even a promise of a Messiah.

The unexampled increase in the expenditure of the European states upon their armaments led the Arbitration Alliance this year to issue a memorial urging the Government to co-operate with other Governments in reducing naval and military burdens. Huxley was asked to sign this memorial, and replied to the secretary as follows:—

HODESLEA, EASTBOURNE, *June 21, 1894.*

DEAR SIR—I have taken some time to consider the memorial to which you have called my attention, and I regret that I do not find myself able to sign it.

Not that I have the slightest doubt about the magnitude of the evils which accrue from the steady increase of European armaments; but because I think that this regrettable fact is merely the superficial expression of social forces, the operation of which cannot be sensibly affected by agreements between Governments.

In my opinion it is a delusion to attribute the growth of armaments to the "exactions of militarism." The "exactions of industrialism," generated by international commercial competition, may, I believe, claim a much larger share in prompting that growth. Add to this the French thirst for revenge, the most just determination of the German and Italian peoples to assert their national unity; the Russian Panslavonic fanaticism and desire for free access to the western seas; the Papacy steadily fishing in the troubled waters for the means of recovering its lost (I hope for ever lost) temporal possessions and spiritual supremacy; the "sick man," kept alive only because each of his doctors is afraid of the other becoming his heir.

When I think of the intensity of the perturbing agencies which arise out of these and other conditions of modern European society, I confess that the attempt to counteract them by asking Governments to agree to a maximum military expenditure, does not appear to me to be worth making; indeed I think it might do harm by leading people to suppose that the desires of Governments are the chief agents in determining whether peace or war shall obtain in Europe.—I am, yours faithfully,

T. H. HUXLEY.

Later in the year, on August 8, took place the meeting of the British Association at Oxford, noteworthy for the presidential address delivered by Lord Salisbury, Chancellor of the University, in which the doctrine of evolution was "enunciated as a matter of course—disputed by no reasonable man," although accompanied by a description of the working of the natural selection and variation which appeared to the man of science a mere travesty of these doctrines.

Huxley had been persuaded to attend this meeting, the more willingly, perhaps, since his reception at Oxford the year before suggested that there would be a special piquancy in the contrast between this and the last meeting of the Association at Oxford in 1860. He was not disappointed.

Details apart, the cardinal situation was reversed. The genius of the place had indeed altered. The representatives of the party, whose prophet had once contemptuously come here to anathematise the "Origin," returned at length to the same spot to admit—if not altogether ungrudgingly—the greatness of the work accomplished by Darwin.

Once under promise to go, he could not escape without the "few words" which he now found so tiring; but he took the part which assured him greatest freedom, as seconder of the vote of thanks to the president for his address. The study of an advance copy of the address raised an "almost overwhelming temptation" to criticise certain statements contained in it; but this would have been out of place in seconding a vote of thanks; and resisting the temptation, he only "conveyed criticism," as he writes to Professor Lewis Campbell, "in the form of praise": going so far as to suggest "it might be that, in listening to the deeply interesting address of the President, a thought had occasionally entered his mind how rich and profitable might be the discussion of that paper in Section D" (Biology). It was not exactly an off-hand speech. Writing to Sir M. Foster for any good report which might appear in an Oxford paper, he says:—

I have no notes of it. I wrote something on Tuesday night, but this draft is no good, as it was metamorphosed two or three times over on Wednesday.

One who was present and aware of the whole situation once described how he marked the eyes of another interested member of the audience, who knew that Huxley was to speak, but not what he meant to say, turning anxiously whenever the president reached a critical phrase in the address, to see how he would take it. But the expression of his face told nothing; only those who knew him well could infer a suppressed impatience from a little twitching of his foot.

Of this occasion Professor Henry F. Osborn, one of his old pupils, writes in his "Memorial Tribute to Thomas H. Huxley" (*Transactions of the N. Y. Acad. Soc.* vol. xv.):—



Huxley's last public appearance was at the meeting of the British Association at Oxford. He had been very urgently invited to attend, for, exactly a quarter of a century before, the Association had met at Oxford, and Huxley had had his famous encounter with Bishop Wilberforce. It was felt that the anniversary would be an historic one, and incomplete without his presence, and so it proved to be. Huxley's especial duty was to second the vote of thanks for the Marquis of Salisbury's address—one of the invariable formalities of the opening meetings of the Association. The meeting proved to be the greatest one in the history of the Association. The Sheldonian Theatre was packed with one of the most distinguished scientific audiences ever brought together, and the address of the Marquis was worthy of the occasion. The whole tenor of it was unknown in science. Passing from the unsolved problems of astronomy, chemistry, and physics, he came to biology. With delicate irony he spoke of the "*comforting word, evolution,*" and passing to the Weismannian controversy, implied that the diametrically opposed views so frequently expressed nowadays threw the whole process of evolution into doubt. It was only too evident that the Marquis himself found no comfort in evolution, and even entertained a suspicion as to its probability. It was well worth the whole journey to Oxford to watch Huxley during this portion of the address. In his red doctor-of-laws gown, placed upon his shoulders by the very body of men who had once referred to him as "a Mr. Huxley," he sank deeper into his chair upon the very front of the platform and restlessly tapped his foot. His situation was an unenviable one. He had to thank an ex-Prime Minister of England and present Chancellor of Oxford University for an address, the sentiments of which were directly against those he himself had been maintaining for twenty-five years. He said afterwards that when the proofs of the Marquis's address were put into his hands the day before, he realised that he had before him a most delicate and difficult task. Lord Kelvin (Sir William Thomson) one of the most distinguished living physicists, first moved the vote of thanks, but his reception was nothing to the tremendous applause which greeted Huxley in the heart of that University whose cardinal principles he had so long been opposing. Considerable anxiety had been felt by his friends lest his voice should fail to fill the theatre, for it had signally failed during his Romanes Lecture delivered in Oxford the year before, but when Huxley arose he reminded you of a venerable gladiator returning to the arena

after years of absence. He raised his figure and his voice to its full height, and, with one foot turned over the edge of the step, veiled an unmistakable and vigorous protest in the most gracious and dignified speech of thanks.

Throughout the subsequent special sessions of this meeting Huxley could not appear. He gave the impression of being aged but not infirm, and no one realised that he had spoken his last word as champion of the law of evolution.

Such criticism of the address as he actually expressed reappears in the leading article, "Past and Present," which he wrote for *Nature* to celebrate the twenty-fifth anniversary of its foundation (Nov. 1, 1894).

The essence of the criticism is that with whatever demonstrations of hostility to parts of the Darwinian theory Lord Salisbury covered the retreat of his party from their ancient positions, he admitted the validity of the main points for which Darwin contended.

The essence of this great work (the *Origin of Species*) may be stated summarily this: it affirms the mutability of species and the descent of living forms, separated by differences of more than varietal value, from one stock. That is to say, it propounds the doctrine of evolution as far as biology is concerned. So far, we have merely a re-statement of a doctrine which, in its most general form, is as old as scientific speculation. So far, we have the two theses which were declared to be scientifically absurd and theologically damnable by the Bishop of Oxford in 1860.

It is also of these two fundamental doctrines that, at the meeting of the British Association in 1894, the Chancellor of the University of Oxford spoke as follows:—

"Another lasting and unquestioned effect has resulted from Darwin's work. He has, as a matter of fact, disposed of the doctrine of the immutability of species. . . ."

"Few now are found to doubt that animals separated by differences far exceeding those that distinguished what we know as species have yet descended from common ancestors."

Undoubtedly, every one conversant with the state of biological science is aware that general opinion has long had good reason for making the *volte face* thus indicated. It is also mere justice to Darwin to say that this "lasting and unquestioned" revolution is, in a very real sense, his work. And yet it is also true that, if all the conceptions promulgated in the *Origin of*

*Species* which are peculiarly Darwinian were swept away, the theory of the evolution of animals and plants would not be in the slightest degree shaken.

The strain of this single effort was considerable: "I am frightfully tired," he wrote on August 11, "but the game was worth the candle."

Letters to Sir J. D. Hooker and to Professor Lewis Campbell contain his own account of the affair. The reference in the latter to the priests is in reply to Professor Campbell's story of one of Jowett's last sayings. They had been talking of the collective power of the priesthood to resist the introduction of new ideas; a long pause ensued, and the old man seemed to have slipped off into a doze, when he suddenly broke the silence by saying, "The priests will always be too many for you."

THE SPA, TUNBRIDGE WELLS, *Aug. 12, 1894.*

MY DEAR HOOKER—I wish, as everybody wished, you had been with us on Wednesday evening at Oxford when we settled accounts for 1860, and got a receipt in full from the Chancellor of the University, President of the Association, and representative of ecclesiastical conservatism and orthodoxy.

I was officially asked to second the vote of thanks for the address, and got a copy of it the night before—luckily—for it was a kittle business. . . .

It was very queer to sit there and hear the doctrines you and I were damned for advocating thirty-four years ago at Oxford, enunciated as matters of course—disputed by no reasonable man!—in the Sheldonian Theatre by the Chancellor. . . .

Of course there is not much left of me, and it will take a fortnight's quiet at Eastbourne (whither we return on Tuesday next) to get right. But it was a pleasant last flare-up in the socket!

With our love to you both—Ever yours affectionately,  
T. H. HUXLEY.

HODESLEA, *Aug. 18, 1894.*

MY DEAR CAMPBELL—I am setting you a good example. You and I are really too old friends to go on wasting ink in honorary prefixes.

I had a very difficult task at Oxford. The old Adam, of course, prompted the tearing of the address to pieces, which

would have been a very easy job, especially the latter half of it. But as that procedure would not have harmonised well with the function of a seconder of a vote of thanks, and as, moreover, Lord S. was very just and good in his expressions about Darwin, I had to convey criticism in the shape of praise.

It was very curious to me to sit there and hear the Chancellor of the University accept, as a matter of course, the doctrines for which the Bishop of Oxford coarsely anathematised us thirty-four years earlier. *E pur si muove!*

I am not afraid of the priests in the long-run. Scientific method is the white ant which will slowly but surely destroy their fortifications. And the importance of scientific method in modern practical life—always growing and increasing—is the guarantee for the gradual emancipation of the ignorant upper and lower classes, the former of whom especially are the strength of the priests.

My wife had a very bad attack of her old enemy some weeks ago, and she thought she would not be able to go to Oxford. However, she picked up in the wonderful elastic way she has, and I believe was less done-up than I when we left on the Friday morning. I was glad the wife was there, as the meeting gave me a very kind reception, and it was probably the last flare-up in the socket.

The Warden of Merton took great care of us, but it was sad to think of the vacuity of Balliol.

Please remember me very kindly to Father Steffens and the Steeles, and will you tell Herr Walther we are only waiting for a balloon to visit the hotel again?

With our affectionate regards to Mrs. Campbell and yourself  
—Ever yours very faithfully,

T. H. HUXLEY.

Here also belong several letters of miscellaneous interest. One is to Mrs. Lewis Campbell at the Maloja:—

HODESLEA, Aug. 20, 1894.

MY DEAR MRS. CAMPBELL—What a pity I am not a telepath! I might have answered your inquiry in the letter I was writing to your husband yesterday.

The flower I found on the island in Sils Lake was a cross between *Gentiana lutea* and *Gentiana punctata*—nothing new, but interesting in many ways as a natural hybrid.

As to baptising the island, I am not guilty of usurping ecclesiastical functions to that extent. I have a notion that the

island has a name already, but I cannot recollect it. Walther would know.

My wife had a bad attack, and we were obliged to give up some visits we had projected. But she got well enough to go to Oxford with me for a couple of days, and really stood the racket better than I did.

At present she is fairly well, and I hope the enemy may give her a long respite. The Colliers come to us at the end of this month, and that will do her good.

With our affectionate regards to you both and remembrances to our friends—Ever yours very truly,

T. H. H.

The first of the following set refers to a lively piece of nonsense which Huxley wrote just before going to stay with the Romanes' at Oxford on the occasion of the Romanes Lecture.\* After Professor Romanes' death, Mrs. Romanes asked leave to print it in the biography of her husband. In the other letters, Huxley gives his consent, but, with his usual care for the less experienced, tried to prevent any malicious perversion of the fun which might put her in a false position.

#### TO MRS. ROMANES

HODESLEA, *Sept.* 20, 1894.

I do not think I can possibly have any objection to your using my letter if you think it worth while—but perhaps you had better let me look at it, for I remember nothing about it—and my letters to people whom I trust are sometimes more plain-spoken than polite about things and men. You know at first there was some talk of my possibly supplying Gladstone's place in case of his failure, and I would not be sure of my politeness in that quarter!

Pray do not suppose that your former letter was other than deeply interesting and touching to me. I had more than half a mind to reply to it, but hesitated with a man's horror of touching a wound he cannot heal.

And then I got a bad bout of "liver," from which I am just picking up.

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\* See p. 373.

HODESLEA, *Sept.* 22, 1894.

It's rather a rollicking epistle, I must say, but as my wife (who sends her love) says she thinks she is the only person who has a right to complain (and she does not), I do not know why it should not be published.

*P.S.*—I fancy very few people will catch the allusion about not contradicting me. But perhaps it would be better to take the opinion of some impartial judge on that point.

I do not care the least on my own account, but I see my words might be twisted into meaning that you had told me something about your previous guest, and that I referred to what you had said.

Of course you had done nothing of the kind, but as a wary old fox, experienced sufferer from the dodges of the misrepresenter, I feel bound not to let you get into any trouble if I can help it.

A regular lady's *P.S.* this.

*P.S.*—Letter returned herewith.

TO MR. LESLIE STEPHEN

HODESLEA, *Oct.* 16, 1894.

MY DEAR STEPHEN—I am very glad you like to have my *omnium gatherum*, and think the better of it for gaining me such a pleasant letter of acknowledgment.

It is a great loss to me to be cut off from all my old friends, but sticking closely to my hermitage, with fresh air and immense quantities of rest, have become the conditions of existence for me, and one must put up with them.

I have not paid all the debt incurred in my Oxford escapade yet—the last “little bill” being a sharp attack of lumbago, out of which I hope I have now emerged. But my deafness alone should bar me from decent society. I have not the moral courage to avoid making shots at what people say, so as not to bore them; and the results are sometimes disastrous.

I don't see there is any real difference between us. You are charitable enough to overlook the general immorality of the cosmos on the score of its having begotten morality in one small part of its domain.—Ever yours very faithfully,

T. H. HUXLEY.

TO MR. G—— S——\*

HODESLEA, *Oct.* 31, 1894.

DEAR MR. S——“Liver,” “lumbago,” and other small ills the flesh is heir to, have been making me very lazy lately, especially about letter-writing.

You have got into the depths where the comprehensible ends in the incomprehensible—where the symbols which may be used with confidence so far begin to get shaky.

It does not seem to me absolutely necessary that matter should be composed of solid particles. The “atoms” may be persistent whirlpools of a continuous “substance”—which substance, if at rest, could not affect us (all sensory impression being dependent on motion) and consequently would *for us* = 0. The evolution of matter would be the getting under weigh of this “nothing for us” until it became the “something for us,” the different motions of which give us the mental states we call the qualities of things.

But it needs a very steady head to walk safely among these abysses of thought, and the only use of letting the mind range among them is as a corrective to the hasty dogmatism of the so-called materialists, who talk just as glibly of that of which they know nothing as the most bigoted of the orthodox.

Here also stand two letters to Lord Farrer, one before, the other after, his address at the Statistical Society on the Relations between Morals, Economics and Statistics, which touch on several philosophical and social questions, always, to his mind, intimately connected, and wherein wrong modes of thought indubitably lead to wrong modes of action. Noteworthy is a defence of the fundamental method of Political Economy, however much its limitations might be forgotten by some of its exponents. The reference to the Church agitation to introduce dogmatic teaching into the elementary schools has also a lasting interest.

HODESLEA, *Nov.* 6, 1894.

MY DEAR FARRER—Whenever you get over the optimism of your youthful constitution (I wish I were endowed with that blessing) you will see that the Gospels and I are right about the

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\* See p. 387.

Devil being "Prince" (note the distinction—not "king") of the Cosmos.

The *a priori* road to scientific, political, and all other doctrine is H.R.H. Satan's invention—it is the intellectual, broad, and easy path which leadeth to Jehannum.

The King's road is the strait path of painful observation and experiment, and few they be that enter thereon.

R. G. Latham, queerest of men, had singular flashes of insight now and then. Forty years ago he gravely told me that the existence of the Established Church was to his mind one of the best evidences of the recency of the evolution of the human type from the simian.

How much there is to confirm this view in present public opinion and the intellectual character of those who influence it!

It explains all your difficulties at once, and I regret that I do not seem to have mentioned it at any of those mid-day symposia which were so pleasant when you and I were younger.

—Ever yours very faithfully,

T. H. HUXLEY.

*P.S.—Apropos* of Athelstan Riley and his friends—I feel rather obliged to them. I assented to the compromise (1) because I felt that English opinion would not let us have the education of the masses at any cheaper price; (2) because, with the Bible in lay hands, I was satisfied that the teaching from it would gradually become modified into harmony with common sense.

I do not doubt that this is exactly what has happened, and is the ground of the alarm of the orthodox.

But I do not repent of the compromise in the least. Twenty years of reasonably good primary education is "worth a mass."

Moreover the Diggleites stand to lose anyhow, and they will lose most completely and finally if they win at the elections this month. So I am rather inclined to hope they may.

HODESLEA, STAVELEY ROAD, EASTBOURNE,

Nov. 3, 1894.

MY DEAR MR. CLODD—They say that the first thing an Englishman does when he is hard up for money is to abstain from buying books. The first thing I do when I am liver-y, lumbagy, and generally short of energy, is to abstain from answering letters. And I am only just emerging from a good many weeks of that sort of flabbiness and poverty.

Many thanks for your notice of Kidd's book. Some vile punsters called it an attempt to put a Kid glove on the iron hand



of Nature. I thought it (I mean the book, not the pun) clever from a literary point of view, and worthless from any other. You will see that I have been giving Lord Salisbury a Roland for his Oliver in *Nature*. But, as hinted, if we only had been in Section D!

With my wife's and my kind regards and remembrances—  
Ever yours very truly, T. H. HUXLEY.

ATHENÆUM CLUB, Dec. 19, 1894.

MY DEAR FARRER—I am indebted to you for giving the recording angel less trouble than he might otherwise have had, on account of the worse than usual unpunctuality of the London and Brighton this morning. For I have utilised the extra time in reading and thinking over your very interesting address.

Thanks for your protest against the mischievous *a priori* method, which people will not understand is as gross an anachronism in social matters as it would be in Hydrostatics. The so-called "Sociology" is honeycombed with it, and it is hard to say who are worse, the individualists or the collectivists. But in your just wrath don't forget that there is such a thing as a science of social life, for which, if the term had not been so hopelessly degraded, Politics is the proper name.

Men are beings of a certain constitution, who, under certain conditions, will as surely tend to act in certain ways as stones will tend to fall if you leave them unsupported. The laws of their nature are as invariable as the laws of gravitation, only the applications to particular cases offer worse problems than the case of the three bodies.

The Political Economists have gone the right way to work—the way that the physical philosopher follows in all complex affairs—by tracing out the effects of one great cause of human action, the desire of wealth, supposing it to be unchecked.

If they, or other people, have forgotten that there are other potent causes of action which may interfere with this, it is no fault of scientific method but only their own stupidity.

Hydrostatics is not a "dismal science," because water does not always seek the lowest level—*e.g.* from a bottle turned upside down, if there is a cork in the neck!

There is much need that somebody should do for what is vaguely called "Ethics" just what the Political Economists have done. Settle the question of what will be done under the unchecked action of certain motives, and leave the problem of "ought" for subsequent consideration.

For, whatever they ought to do, it is quite certain the majority of men will act as if the attainment of certain positive and negative pleasures were the end of action.

We want a science of "Eubiotics" to tell us exactly what will happen if human beings are exclusively actuated by the desire of well-being in the ordinary sense. Of course the utilitarians have laid the foundations of such a science, with the result that the nicknamer of genius called this branch of science "pig philosophy," making just the same blunder as when he called political economy "dismal science."

"Moderate well-being" may be no more the worthiest end of life than wealth. But if it is the best to be had in this queer world—it may be worth trying for.

But you will begin to wish the train had been *punctual!*

Draw comfort from the fact that if error is always with us, it is, at any rate, remediable. I am more hopeful than when I was young. Perhaps life (like matrimony, as some say) should begin with a little aversion!—Ever yours very faithfully,

T. H. HUXLEY.

Some years before this, a fund for a "Darwin Medal" had been established in memory of the great naturalist, the medal to be awarded biennially for researches in biology. With singular appropriateness, the first award was made to Dr. A. R. Wallace, the joint propounder of the theory of Natural Selection, whose paper, entrusted to Darwin's literary sponsorship, caused the speedy publication of Darwin's own long-continued researches and speculations. The second, with equal appropriateness, was to Sir J. D. Hooker, both as a leader in science and a helper and adviser of Darwin.

Huxley's own view of such scientific honours as medals and diplomas was that they should be employed to stimulate for the future rather than to reward for the past; and delighted as he was at the poetic justice of these two awards, this justice once satisfied, he let his opinion be known that thenceforward the Darwin Medal ought to be given only to younger men. But when this year he found the Darwin Medal awarded to himself "for his researches in biology and his long association with Charles Darwin," he could not but be touched and gratified by this mark of appreciation from his fellow-workers in science, this association

in one more scientific record with old allies and true friends—to “have his niche in the Pantheon” next to Hooker and near to Darwin.

It was a rare instance of the fitness of things that the three men who had done most to develop and to defend Darwin’s ideas should live to stand first in the list of the Darwin medallists; and Huxley felt this to be a natural closing of a chapter in his life, a fitting occasion on which to bid farewell to public life in the world of science. Almost at the same moment another chapter in science reached its completion in the “coming of age” of *Nature*, a journal which, when scientific interests at large had grown stronger, had succeeded in realising his own earlier efforts to found a scientific organ, and with which he had always been closely associated.

As mentioned above, he wrote for the November number an introductory article called “Past and Present,” comparing the state of scientific thought of the day with that of twenty-five years before, when the journal was first started. To celebrate the occasion, a dinner was to be held this same month of all who had been associated with *Nature*, and this Huxley meant to attend, as well as the more important anniversary dinner of the Royal Society on St. Andrew’s Day.

I have promised (he writes on November 6 to Sir M. Foster) to go to the *Nature* dinner if I possibly can. Indeed I should be sorry to be away. As to the R.S. nothing short of being confined to bed will stop me. And I shall be good for a few words after dinner.

Thereafter I hope not to appear again on any stage.

His letter about the medal expresses his feelings as to the award.

HODESLEA, Nov. 2, 1894.

MY DEAR FOSTER—Didn’t I tell the P.R.S., Secretaries, Treasurer, and all the Fellows thereof, when I spake about Hooker years ago, that thenceforth the Darwin Medal was to be given to the young, and not to useless old extinct volcanoes? I ought to be very angry with you all for coolly ignoring my wise counsels.

But whether it is vanity or something a good deal better, I am not. One gets chill old age, and it is very pleasant to be warmed up unexpectedly even against one's injunctions. Moreover, my wife is very pleased, not to say jubilant; and if I were made Archbishop of Canterbury I should not be able to convince her that my services to Theology were hardly of the sort to be rewarded in that fashion.

I need not say what I think about your action in the matter, my faithful old friend. With our love to you both—Ever yours,  
T. H. HUXLEY.

I suppose you are all right again, as you write from the R.S. Liver permitting I shall attend meeting and dinner. It is very odd that the Medal should come along with my pronouncement in *Nature*, which I hope you like. I cut out rather a stinging paragraph at the end.

HODESLEA, EASTBOURNE, *Nov.* II, 1894.

MY DEAR DONNELLY—Why on earth did I not answer your letter before? Echo (being Irish) says, "Because of your infernal bad habit of putting off; which is growing upon you, you wretched old man."

Of course I shall be very glad if anything can be done for S—. Howes has written to me about him since your letter arrived—and I am positively going to answer his epistle. It's Sunday morning, and I feel good.

You will have seen that the R.S. has been giving me the Darwin Medal, though I gave as broad a hint as was proper the last time I spoke at the Anniversary, that it ought to go to the young men. Nevertheless, with the ordinary inconsistency of the so-called "rational animal," I am well pleased.

I hope you will be at the dinner, and would ask you to be my guest—but as I thought my boys and boys-in-law would like to be there, I have already exceeded my lawful powers of invitation and had to get a dispensation from Michael Foster.

I suppose I shall be like a horse that "stands at livery" for some time after—but it is positively my last appearance on any stage.

We were very glad to hear from Lady Donnelly that you had had a good and effectual holiday. With our love—Ever yours,  
T. H. HUXLEY.

I return Howes' letter in case you want it. I see I need not write to him again after all. Three cheers!

Please give Lady Donnelly this. A number of estimable

members of her sex have flown at me for writing what I thought was a highly complimentary letter. But *she* will be just, I know.

“The best of women are apt to be a little weak in the great practical arts of give-and-take, and putting up with a beating, and a little too strong in their belief in the efficacy of government. Men learn about these things in the ordinary course of their business; women have no chance in home life, and the boards and councils will be capital schools for them. Again, in the public interest it will be well; women are more naturally economical than men, and have none of our false shame about looking after pence. Moreover, they don't job for any but their lovers, husbands, and children, so that we know the worst.”

The speech at the Royal Society Anniversary dinner—which he evidently enjoyed making—was a fine piece of speaking, and quite carried away the audience, whether in the gentle depreciation of his services to science, or in his profession of faith in the methods of science and the final triumph of the doctrine of evolution, whatever theories of its operation might be adopted or discarded in the course of further investigation.

I quote from the *Times* report of the speech:—

But the most difficult task that remains is that which concerns myself. It is 43 years ago this day since the Royal Society did me the honour to award me a Royal medal, and thereby determined my career. But, having long retired into the position of a veteran, I confess that I was extremely astonished—I honestly also say that I was extremely pleased to receive the announcement that you had been good enough to award to me the Darwin Medal. But you know the Royal Society, like all things in this world, is subject to criticism. I confess that with the ingrained instincts of an old official that which arose in my mind after the reception of the information that I had been thus distinguished was to start an inquiry which I suppose suggests itself to every old official—How can my Government be justified? In reflecting upon what had been my own share in what are now very largely ancient transactions, it was perfectly obvious to me that I had no such claims as those of Mr. Wallace. It was perfectly clear to me that I had no such claims as those of my life-long friend Sir Joseph Hooker, who for 25 years placed all his great sources of knowledge, his sagacity, his in-

dustry, at the disposition of his friend Darwin. And really, I begin to despair of what possible answer could be given to the critics whom the Royal Society, meeting as it does on November 30, has lately been very apt to hear about on December 1. Naturally there occurred to my mind that famous and comfortable line, which I suppose has helped so many people under like circumstances, "They also serve who only stand and wait." I am bound to confess that the standing and waiting, so far as I am concerned, to which I refer, has been of a somewhat peculiar character. I can only explain it, if you will permit me to narrate a story which came to me in my old nautical days, and which, I believe, has just as much foundation as a good deal of other information which I derived at the same period from the same source. There was a merchant ship in which a member of the Society of Friends had taken passage, and that ship was attacked by a pirate, and the captain thereupon put into the hands of the member of the Society of Friends a pike, and desired him to take part in the subsequent action, to which, as you may imagine, the reply was that he would do nothing of the kind; but he said that he had no objection to stand and wait at the gangway. He did stand and wait with the pike in his hands, and when the pirates mounted and showed themselves coming on board he thrust his pike with the sharp end forward into the persons who were mounting, and he said, "Friend, keep on board thine own ship." It is in that sense that I venture to interpret the principle of standing and waiting to which I have referred. I was convinced as firmly as I have ever been convinced of anything in my life, that the *Origin of Species* was a ship laden with a cargo of rich value, and which, if she were permitted to pursue her course, would reach a veritable scientific Golconda, and I thought it my duty, however naturally averse I might be to fighting, to bid those who would disturb her beneficent operations to keep on board their own ship. If it has pleased the Royal Society to recognise such poor services as I may have rendered in that capacity, I am very glad, because I am as much convinced now as I was 34 years ago that the theory propounded by Mr. Darwin—I mean that which he propounded, not that which has been reported to be his by too many ill-instructed, both friends and foes—has never yet been shown to be inconsistent with any positive observations, and if I may use a phrase which I know has been objected to, and which I use in a totally different sense from that in which it was first proposed by its first propounder, I do believe that on

all grounds of pure science it "holds the field," as the only hypothesis at present before us which has a sound scientific foundation. It is quite possible that you will apply to me the remark that has often been applied to persons in such a position as mine, that we are apt to exaggerate the importance of that to which our lives have been more or less devoted. But I am sincerely of opinion that the views which were propounded by Mr. Darwin 34 years ago may be understood hereafter as constituting an epoch in the intellectual history of the human race. They will modify the whole system of our thought and opinion, our most intimate convictions. But I do not know, I do not think anybody knows, whether the particular views which he held will be hereafter fortified by the experience of the ages which come after us; but of this thing I am perfectly certain, that the present course of things has resulted from the feeling of the smaller men who have followed him that they are incompetent to bend the bow of Ulysses, and in consequence many of them are seeking their salvation in mere speculation. Those who wish to attain to some clear and definite solution of the great problems which Mr. Darwin was the first person to set before us in later times must base themselves upon the facts which are stated in his great work, and, still more, must pursue their inquiries by the methods of which he was so brilliant an exemplar throughout the whole of his life. You must have his sagacity, his untiring search after the knowledge of fact, his readiness always to give up a preconceived opinion to that which was demonstrably true, before you can hope to carry his doctrines to their ultimate issue; and whether the particular form in which he has put them before us may be such as is finally destined to survive or not is more, I venture to think, than anybody is capable at this present moment of saying. But this one thing is perfectly certain—that it is only by pursuing his methods, by that wonderful single-mindedness, devotion to truth, readiness to sacrifice all things for the advance of definite knowledge, that we can hope to come any nearer than we are at present to the truths which he struggled to attain.

TO SIR J. D. HOOKER

HODESLEA, EASTBOURNE, *Dec. 4, 1894.*

MY DEAR OLD MAN—See the respect I have for your six years seniority! I wished you had been at the dinner, but was glad you were not. Especially as next morning there

was a beastly fog, out of which I bolted home as fast as possible.

I shall have to give up these escapades. They knock me up for a week afterwards. And really it is a pity, just as I have got over my horror of public speaking, and find it very amusing. But I suppose I should gravitate into a bore as old fellows do, and so it is as well I am kept out of temptation.

I will try to remember what I said at the *Nature* dinner.\* I scolded the young fellows pretty sharply for their slovenly writing.

There will be a tenth vol. of Essays some day, and an Index rerum. Do you remember how you scolded me for being too speculative in my maiden lecture on Animal Individuality forty odd years ago? "On revient toujours," or, to put it another way, "The dog returns to his etc. etc."

So I am deep in philosophy, grovelling through Diogenes Laertius—Plutarch's *Placita* and sich—and often wondering whether the schoolmasters have any better ground for maintaining that Greek is a finer language than English than the fact that they can't write the latter dialect.

So far as I can see, my faculties are as good (including memory for anything that is not useful) as they were fifty years ago, but I can't work long hours, or live out of fresh air. Three days of London bowls me over.

I expect you are in much the same case. But you seem to be able to stoop over specimens in a way impossible to me. It is that incapacity has made me give up dissection and microscopic work. I do a lot on my back, and I can tell you that the latter posture is an immense economy of strength. Indeed, when my head was troublesome, I used to spend my time either in active outdoor exercise or horizontally.

The Stracheys were here the other day, and it was a great pleasure to us to see them. I think he has had a very close shave with that accident. There is nobody whom I should more delight to honour—a right good man all round—but I am not competent to judge of his work. You are, and I do not see why you should not suggest it. I would give him a medal for being R. Strachey, but probably the Council would make difficulties.

By the way, do you see the *Times* has practically climbed down about the R.S.—came down backwards like a bear, growl-

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\* A brief report of this speech is to be found in the *British Medical Journal* for December 8, 1894, p. 1262.



ing all the time? I don't think we shall have any more first of December criticisms.

Lord help you through all this screed. With our love to you both—Ever yours affectionately,  
T. H. HUXLEY.

Abram, Abraham became  
By will divine;  
Let pickled Brian's name  
Be changed to Brine!\*

*Poetae Minores.*

Poor Brian.—Brutal jest!

The following was written to a friend who had alluded to his painful recollection of a former occasion when he was Huxley's guest at the anniversary dinner of the Royal Society, and was hastily summoned from it to find his wife dying.

I fully understand your feeling about the R.S. Dinner. I have not forgotten the occasion when you were my guest: still less my brief sight of you when I called the next day.

These things are the "lachrymae rerum"—the abysmal griefs hidden under the current of daily life, and seemingly forgotten, till now and then they come up to the surface—a flash of agony—like the fish that jumps in a calm pool.

One has one's groan and goes to work again.

If I knew of anything else for it, I would tell you; but all my experience ends in the questionable thanksgiving, "It's lucky it's no worse."

With which bit of practical philosophy, and our love, believe me, ever yours affectionately,  
T. H. HUXLEY.

Before speaking of his last piece of work, in the vain endeavour to complete which, he exposed himself to his old enemy, influenza, I shall give several letters of miscellaneous interest.

The first is in reply to Lord Farrer's inquiry as to where he could obtain a fuller account of the subject tersely discussed in the chapter he had contributed to the *Life of Owen*. †

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\* Sir Joseph's son, Brian, had fallen into a pan of brine.

† "Which," wrote Lord Farrer, "is just what I wanted as an outline of the Biological and Morphological discussion of the last roo

HODESLEA, *Jan. 26, 1895.*

MY DEAR FARRER—Miserable me! Having addressed myself to clear off a heap of letters that have been accumulating, I find I have not answered an enquiry of yours of nearly a month's standing. I am sorry to say that I cannot tell you of any book (readable or otherwise) that will convert my "pemmican" into decent broth for you.

There are histories of zoology and of philosophical anatomy, but they all of them seem to me to miss the point (which you have picked out of the pemmican). Indeed, that is just why I took such a lot of pains over these 50 or 60 pages. And I am immensely tickled by the fact that among all the critical notices I have seen, not a soul sees what I have been driving at as you have done. I really wish you would write a notice of it, just to show these Gigadibses (*vide* Right Rev. Bloughram) what blind buzzards they are!

Enter a maid. "Please sir, Mrs. Huxley says she would be glad if you would go out in the sun." "All right, Allen." Anecdote for your next essay on Government!

The fact is, I have been knocked up ever since Tuesday, when our University Deputation came off; and my good wife (who is laid up herself) suspects me (not without reason) of failing to take advantage of a gleam of sunshine.

By the way, can you help us over the University business? Lord Rosebery is favourable, and there is absolutely nobody on the other side except sundry Philistines, who, having got their degrees, are desirous of inflating their market value.—Yours very truly,

T. H. HUXLEY.

The next is in answer to an appeal for a subscription, from the Church Army.

*Jan. 26, 1895.*

I regret that I am unable to contribute to the funds of the Church Army.

I hold it to be my duty to do what I can for the cases of distress of which I have direct knowledge; and I am glad to be able now and then to give timely aid to the industrious and worthy people with whom, as a householder, I am brought into personal relation; and who are so often engaged in a noiseless and unpitied but earnest struggle to do well.

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years. But it is 'Pemmican' to an aged and enfeebled digestion. Is there such a thing as a diluted solution of it in the shape of any readable book?"



turned up something like

in morning like) in low

country, low paper, I have

but received

at least a copy in the state, I have

with an eye on the low

in the ground



Pithecanthropus  
erectus Dubois  
(fossil?)

the Aino-in about the  
body small with call a small  
cutting under the skin of the

In my judgment, a domestic servant, who is perhaps giving half her wages to support her old parents, is more worthy of help than half a dozen Magdaleus.

Under these circumstances, you will understand that such funds as are at my disposal are already fully engaged.

The following is to a gentleman—an American, I think—who sent him a long manuscript, an extraordinary farrago of nonsense, to read and criticise, and help to publish. But as he seemed to have acted in sheer simplicity, he got an answer:—

HODESLEA, *Jan.* 31, 1895.

DEAR SIR—I should have been glad if you had taken the ordinary, and, I think convenient course of writing for my permission before you sent the essay which has reached me, and which I return by this post. I should then have had the opportunity of telling you that I do not undertake to read, or take any charge of such matters, and we should both have been spared some trouble.

I the more regret this, since being unwilling to return your work without examination, I have looked at it, and feel bound to give you the following piece of advice, which I fear may be distasteful, as good counsel generally is.

Lock up your essay. For two years—if possible, three—read no popular expositions of science, but devote yourself to a course of sound *practical* instruction in elementary physics, chemistry, and biology.

Then re-read your essay; do with it as you think best; and, if possible, regard a little more kindly than you are likely to do at present, yours faithfully,

T. H. HUXLEY.

The following passage from a letter to Sir J. D. Hooker refers to a striking discovery made by Dubois:—

HODESLEA, EASTBOURNE, *Feb.* 14, 1895.

The Dutchmen seem to have turned up something like the "missing link" in Java, according to a paper I have just received from Marsh. I expect he was a Socratic party, with his hair rather low down on his forehead and warty cheeks.

*Pithecanthropus erectus* Dubois (fossil)

rather Aino-ish about the body, small in the calf, and cheese-cutting in the shins. Le voici!

## CHAPTER XXIII

1895

Two months of almost continuous frost, during which the thermometer fell below zero, marked the winter of 1894-95. Tough, if not strong, as Huxley's constitution was, this exceptional cold, so lowering to the vitality of age, accentuated the severity of the illness which followed in the train of influenza, and at last undermined even his powers of resistance.

But until the influenza seized him, he was more than usually vigorous and brilliant. He was fatigued, but not more so than he expected, by attending a deputation to the Prime Minister in the depth of January, and delivering a speech on the London University question; and in February he was induced to write a reply to the attack upon agnosticism contained in Mr. Arthur Balfour's *Foundations of Belief*. Into this he threw himself with great energy, all the more because the notices in the daily press were likely to give the reading public a wrong impression as to its polemic against his own position. Mr. Wilfrid Ward gives an account of a conversation with him on this subject:—

Some one had sent me Mr. A. J. Balfour's book on the *Foundations of Belief* early in February 1895. We were very full of it, and it was the theme of discussion on the 17th of February, when two friends were lunching with us. Not long after luncheon, Huxley came in, and seemed in extraordinary spirits. He began talking of Erasmus and Luther, expressing a great preference for Erasmus, who would, he said, have impregnated the Church with culture, and brought it abreast of the thought of the times, while Luther concentrated attention on

individual mystical doctrines. "It was very trying for Erasmus to be identified with Luther, from whom he differed absolutely. A man ought to be ready to endure persecution for what he does hold; but it is hard to be persecuted for what you don't hold." I said that I thought his estimate of Erasmus's attitude towards the Papacy coincided with Professor R. C. Jebb's. He asked if I could lend him Jebb's Rede Lecture on the subject. I said that I had not got it at hand, but I added, "I can lend you another book, which I think you ought to read—Balfour's *Foundations of Belief*."

He at once became extremely animated, and spoke of it as those who have read his criticisms, published in the following month, would expect. "You need not lend me that. I have exercised my mind with it a good deal already. Mr. Balfour ought to have acquainted himself with the opinions of those he attacks. One has no objection to being abused for what one *does* hold, as I said of Erasmus; at least, one is prepared to put up with it. An attack on us by some one who understood our position would do all of us good—myself included. But Mr. Balfour has acted like the French in 1870: he has gone to war without any ordnance maps, and without having surveyed the scene of the campaign. No human being holds the opinions he speaks of as 'naturalism.' He is a good debater. He knows the value of a word. The word 'Naturalism' has a bad sound and unpleasant associations. It would tell against us in the House of Commons, and so it will with his readers. 'Naturalism' contrasts with 'supernaturalism.' He has not only attacked us for what we don't hold, but he has been good enough to draw out a catechism for 'us wicked people,' to teach us what we *must* hold."

It was rather difficult to get him to particulars, but we did so by degrees. He said, "Balfour uses the word *phenomena* as applying simply to the outer world and not to the inner world. The only people his attack would hold good of would be the Comtists, who deny that psychology is a science. They may be left out of account. They advocate the crudest eighteenth-century materialism. All the empiricists, from Locke onwards, make the observation of the phenomena of the mind itself quite separate from the study of mere sensation. No man in his senses supposes that the sense of beauty, or the religious feelings (this with a courteous bow to a priest who was present), or the sense of moral obligation, are to be accounted for in terms of sensation, or come to us through sensation." I said that, as

I understood it, I did not think Mr. Balfour supposed they would acknowledge the position he ascribed to them, and that one of his complaints was that they did not work out their premises to their logical conclusions. I added that so far as one of Mr. Balfour's chief points was concerned—the existence of the external world—Mill was almost the only man on their side in this century who had faced the problem frankly, and he had been driven to say that all men can know is that there are “permanent possibilities of sensation.” He did not seem inclined to pursue the question of an external world, but said that though Mill's “logic” was very good, empiricists were not bound by all his theories.

He characterised the book as a very good and even brilliant piece of work from a literary point of view; but as a helpful contribution to the great controversy, the most disappointing he had ever read. I said, “There has been no adverse criticism of it yet.” He answered with emphasis, “No! *but there soon will be.*” “From you?” I asked. “I let out no secrets,” was the reply.

He then talked with great admiration and affection of Mr. Balfour's brother, Francis. His early death, and W. K. Clifford's (Huxley said), had been the greatest loss to science—not only in England, but in the world—in our time. “Half a dozen of us old fogies could have been better spared.” He remembered Frank Balfour as a boy at Eton, and saw his unusual talent there. “Then my friend, Michael Foster, took him up at Cambridge, and found out that he had real genius for biology. I used to say there was science in the blood,” but this new book of his brother's, he added, smiling, “shows I was wrong.”

Apropos to his remark about the Comtists, one of the company pointed out that in later life Comte recognised a science of “the individual,” equivalent to what Huxley meant by psychology. “That,” he replied, “was due to the influence of Clotilde de Vaux. You see,” he added, “with a kind of Sir Charles Grandison bow to my wife, “what power your sex may have.” As Huxley was going out of the house, I said to him that Father A. B. (the priest who had been present) had not expected to find himself in his company. “No! I trust he had plenty of holy water with him,” was the reply.

. . . After he had gone, we were all agreed as to the extraordinary vigour and brilliancy he had shown. Some one said, “He is like a man who is what the Scotch call ‘fey.’” We laughed at the idea, but we naturally recalled the remark later on.



The story of how the article was written is told in the following letters. It was suggested by Mr. Knowles, and undertaken after perusal of the review of the book in the *Times*. Huxley intended to have the article ready for the March number of the *Nineteenth Century*, but it grew longer than he had meant it to be, and partly for this reason, partly for fear lest the influenza, then raging at Eastbourne, might prevent him from revising the whole thing at once, he divided it into two instalments. He writes to one daughter on March 1:—

I suppose my time will come; so I am "making hay while the sun shines" (in point of fact it is raining and blowing a gale outside) and finishing my counterblast to Balfour before it does come.

Love to all you poor past snivellers from an expectant sniveller.

And to another:—

I think the cavalry charge in this month's *Nineteenth* will amuse you. The heavy artillery and the bayonets will be brought into play next month.

Dean Stanley told me he thought being made a bishop destroyed a man's moral courage. I am inclined to think that the practice of the methods of political leaders destroys their intellect for all serious purposes.

No sooner was the first part safely sent off than the contingency he had feared came to pass; only, instead of the influenza meaning incapacity for a fortnight, an unlucky chill brought on bronchitis and severe lung trouble.\* The second part of the article was never fully revised for press.

HODESLEA, EASTBOURNE, *February 8, 1895.*

MY DEAR KNOWLES—Your telegram came before I had looked at to-day's *Times* and the article on Balfour's book, so I answered with hesitation.

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\* As he wrote on February 28 to Sir M. Foster: "If I could compound for a few hours' neuralgia, I would not mind; but those long weeks of debility make me very shy of the influenza demon. Here we are practically isolated. . . . I once asked Gordon why he didn't have the African fever. 'Well,' he said, 'you see, fellows think they shall have it, and they do. I didn't think so, and didn't get it.' Exercise your thinking faculty to that extent."

Now I am inclined to think that the job may be well worth doing, in that it will give me the opportunity of emphasising the distinction between the view I hold and Spencer's, and perhaps of proving that Balfour is an agnostic after my own heart. So please send the book.

Only if this infernal weather, which shrivels me up soul and body, lasts, I do not know how long I may be over the business. However, you tell me to take my own time.—Ever yours very faithfully,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *February 18, 1895.*

MY DEAR KNOWLES—I send you by this post an instalment (the larger moiety) of my article, which I should be glad to have set up at once *in slip*, and sent to me as speedily as may be. The rest shall follow in the course of the next two or three days.

I am rather pleased with the thing myself, so it is probably not so very good! But you will judge for yourself.—Ever yours very faithfully,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *February 19, 1895.*

MY DEAR KNOWLES—We send our best congratulations to Mrs. Knowles and yourself on the birth of a granddaughter. I forget whether you have had any previous experience of the "Art d'être Grandpère" or not—but I can assure you, from 14 such experiences, that it is easy and pleasant of acquirement, and that the objects of it are veritable "articles de luxe," involving much amusement and no sort of responsibility on the part of the possessor.

You shall have the rest of my screed by to-morrow's post.—Ever yours very faithfully,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *February 20, 1895.*

MY DEAR KNOWLES—Seven mortal hours have I been hard at work this day to try to keep my promise to you, and as I find that impossible, I have struck work and will see Balfour and his *Foundations*, and even that ark of literature the *Nineteenth*, at Ballywack, before I do any more.

But the whole affair shall be sent by a morning's post to-morrow. I have the proofs. I have found the thing getting too long for one paper, and requiring far more care than I could put into the next two days—so I propose to divide it, if you see no objection.

And there is another reason for this course. Influenza is raging here. I hear of hundreds of cases, and if it comes my

way, as it did before, I go to bed and stop there—"the world forgetting and by the world forgot"—until I am killed or cured. So you would not get your article.

As it stands, it is not a bad gambit. We will play the rest of the game afterwards, D.V. and K.V.

Hope mother and baby are doing well.—Ever yours,

T. H. HUXLEY.

HODESLEA, EASTBOURNE,

*February 23, 1895, 12.30 P.M.*

MY DEAR KNOWLES—I have just played and won as hard a match against time as I ever knew in the days of my youth. The proofs, happily, arrived by the first post, so I got to work at them before 9, polished them off by 12, and put them into the post (myself) by 12.5. So you ought to have them by 6 P.M. And, to make your mind easy, I have just telegraphed to you to say so. But, Lord's sake! let some careful eye run over the part of which I have had no revise—for I am "capable de tout" in the way of overlooking errors.

I am very glad you like the thing. The second instalment shall be no worse.

I grieve to say that my estimation of Balfour, as a thinker, sinks lower and lower, the further I go.

God help the people who think his book an important contribution to thought! The Gigadibsians who say so are past divine assistance!

We are very glad to hear the grandchild and mother are getting on so well.—Ever yours vry truly,

T. H. HUXLEY.

HODESLEA, EASTBOURNE, *March 8, 1895.*

MY DEAR KNOWLES—The proofs have just arrived, but I am sorry to say that (I believe for the first time in our transactions) I shall have to disappoint you.

Just after I had sent off the MS. influenza came down upon me with a swoop. I went to bed and am there still, with no chance of quitting it in a hurry. My wife is in the same case; *item* one of the maids. The house is a hospital, and by great good fortune we have a capital nurse.

Doctors says it's a mild type,\* in which case I wonder what

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\* "But in the matter of aches and pains, restless paroxysms of coughing and general incapacity, I can give it a high character for efficiency." (To M. Foster, March 7.)

severe types may be like. I find coughing continuously for fourteen hours or so a queer kind of mildness.

Could you put in an excuse on account of influenza?

Can't write any more.—Ever yours, T. H. H.

HODESLEA, EASTBOURNE, *March* 19, 1895.

MY DEAR KNOWLES—I am making use of the pen of my dear daughter and good nurse, in the first place to thank you for your cheque, in the second place to say that you must not look for the article this month. I haven't been out of bed since the 1st, but they are fighting a battle with bronchitis over my body.—Ever yours very faithfully,

For T. H. H.,  
SOPHY HUXLEY.

The next four months were a period of painful struggle against disease, borne with a patience and gentleness which was rare even in the long experience of the trained nurses who tended him. To natural toughness of constitution he added a power of will unbroken by the long strain; and for the sake of others to whom his life meant so much, he wished to recover and willed to do everything towards recovery. And so he managed to throw off the influenza and the severe bronchitis which attended it. What was marvellous at his age, and indeed would scarcely have been expected in a young man, most serious mischief induced by the bronchitis disappeared. By May he was strong enough to walk from the terrace to the lawn and his beloved saxifrages, and to remount the steps to the house without help.

But though the original attack was successfully thrown off, the lung trouble had affected the heart; and in his weakened state, renal mischief ensued. Yet he held out splendidly, never giving in, save for one hour of utter prostration, all through this weary length of sickness. His first recovery strengthened him in expecting to get well from the second attack. And on June 10 he writes brightly enough to Sir J. D. Hooker:—

HODESLEA, EASTBOURNE, *June* 10, 1895.

MY DEAR OLD FRIEND—It was cheering to get your letter and to hear that you had got through winter and diphtheria without scathe.

I can't say very much for myself yet, but I am carried down

to a tent in the garden every day, and live in the fresh air all I can. The thing that keeps me back is an irritability of the stomach tending to the rejection of all solid food. However, I think I am slowly getting the better of it—thanks to my constitutional toughness and careful nursing and dieting.

What has Spencer been trampling on the "Pour le mérite" for, when he accepted the Lyncei? I was just writing to congratulate him when, by good luck, I saw he had refused!

The beastly nausea which comes on when I try to do anything warns me to stop.

With our love to you both—Ever yours,

T. H. HUXLEY.

The last time I saw him was on a visit to Eastbourne from June 22–24. I was astonished to find how well he looked in spite of all; thin, indeed, but browned with the endless sunshine of the 1895 summer as he sat every day in the verandah. His voice was still fairly strong; he was delighted to see us about him, and was cheerful, even merry at times. As the nurse said, she could not expect him to recover, but he did not look like a dying man. When I asked him how he was, he said, "A mere carcass, which has to be tended by other people." But to the last he looked forward to recovery. One day he told the nurse that the doctors must be wrong about the renal mischief, for if they were right, he ought already to be in a state of coma. This was precisely what they found most astonishing in his case; it seemed as if the mind, the strong nervous organisation, were triumphing over the shattered body. Herein lay one of the chief hopes of ultimate recovery.

As late as June 26 he wrote, with shaky handwriting but indomitable spirit, to relieve his old friend from the anxiety he must feel from the newspaper bulletins.

HODESLEA, EASTBOURNE, *June 26, 1895.*

MY DEAR HOOKER—The pessimistic reports of my condition which have got into the papers may be giving you unnecessary alarm for the condition of your old comrade. So I send a line to tell you the exact state of affairs.

There is kidney mischief going on—and it is accompanied by very distressing attacks of nausea and vomiting, which sometimes last for hours and make life a burden.

However, strength keeps up very well considering, and of course all depends upon how the renal business goes. At present I don't feel at all like "sending in my checks," and without being over sanguine I rather incline to think that my native toughness will get the best of it—albuminuria or otherwise.—  
Ever your faithful friend,  
T. H. H.

Misfortunes never come single. My son-in-law, Eckersley, died of yellow fever the other day at San Salvador—just as he was going to take up an appointment at Lima worth £1200 a year. Rachel and her three children have but the slenderest provision.

The next two days there was a slight improvement, but on the third morning the heart began to fail. The great pain subdued by anæsthetics, he lingered on about seven hours, and at half-past three on June 29 passed away very quietly.

He was buried at Finchley, on July 4, beside his brother George and his little son Noel, under the shadow of the oak, which had grown up into a stately young tree from the little sapling it had been when the grave of his first-born was dug beneath it, five and thirty years before.

There was no official ceremony. An old friend, Mr. Llewellyn Davies, came from Kirby Lonsdale to read the service; the many friends who gathered at the grave-side were there as friends mourning the death of a friend, and all touched with the same sense of personal loss.

By his special direction, three lines from a poem written by his wife, were inscribed upon his tombstone—lines inspired by his own robust conviction that, all question of the future apart, this life as it can be lived, pain, sorrow, and evil notwithstanding, is worth—and well worth—living :—

Be not afraid, ye waiting hearts that weep ;  
For still He giveth His belovèd sleep,  
And if an endless sleep He wills, so best.

## CHAPTER XXIV

HE had intellect to comprehend his highest duty distinctly, and force of character to do it; which of us dare ask for a higher summary of his life than that?

SUCH was Huxley's epitaph upon Henslow; it was the standard which he endeavoured to reach in his own life. It is the expression of that passion for veracity which was perhaps his strongest characteristic; an uncompromising passion for truth in thought, which would admit no particle of self-deception, no assertion beyond what could be verified; for truth in act, perfect straightforwardness and sincerity, with complete disregard of personal consequences for uttering unpalatable fact.

Truthfulness, in his eyes, was the cardinal virtue, without which no stable society can exist. Conviction, sincerity, he always respected, whether on his own side or against him. Clever men, he would say, are as common as blackberries; the rare thing is to find a good one. The lie from interested motives was only more hateful to him than the lie from self-delusion or foggy thinking. With this he classed the "sin of faith," as he called it; that form of credence which does not fulfil the duty of making a right use of reason; which prostitutes reason by giving assent to propositions which are neither self-evident nor adequately proved.

This principle has always been far from finding universal acceptance. One of his theological opponents went so far as to affirm that a doctrine may be not only held, but dogmatically insisted on, by a teacher who is, all the time, fully aware that science may ultimately prove it to be quite untenable.

His one course went to the opposite extreme. In teaching, where it was possible to let the facts speak for themselves, he did not further urge their bearing upon wider problems. He preferred to warn beginners against drawing superficial inferences in favour of his own general theories, from facts the real meaning of which was not immediately apparent. Father Hahn (S.J.), who studied under him in 1876, writes:—

One day when I was talking to him, our conversation turned upon evolution. "There is one thing about you I cannot understand," I said, "and I should like a word in explanation. For several months now I have been attending your course, and I have never heard you mention evolution, while in your public lectures everywhere you openly proclaim yourself an evolutionist." \*

Now it would be impossible to imagine a better opportunity for insisting on evolution than his lectures on comparative anatomy, when animals are set side by side in respect of the gradual development of functions. But Huxley was so reserved on this subject in his lectures that, speaking one day of a species forming a transition between two others, he immediately added:—

"When I speak of transition I do not in the least mean to say that one species turned into a second to develop thereafter into a third. What I mean is, that the characters of the second are intermediate between those of the two others. It is as if I were to say that such and such a cathedral, Canterbury, for example, is a transition between York Minster and Westminster Abbey. No one would imagine, on hearing the word transition, that a transmutation of these buildings actually took place from one into another."

But to return to his reply:—

"Here in my teaching lectures (he said to me) I have time to put the facts fully before a trained audience. In my public lectures I am obliged to pass rapidly over the facts, and I put forward my personal convictions. And it is for this that people come to hear me."

As to the question whether children should be brought up in entire disregard to the beliefs rejected by himself, but still current among the mass of his fellow-countrymen, he

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\* *Revue des Questions Scientifiques* (Brussels), for October 1895.



was of opinion that they ought to know "the mythology of their time and country," otherwise one would at the best tend to make young prigs of them; but as they grew up, their questions should be answered frankly.\*

The natural tendency to veracity, strengthened by the observation of the opposite quality in one with whom he was early brought into contact, received its decisive impulse, as has been told before, from Carlyle, whose writings confirmed and established his youthful reader in a hatred of shams and make-believes equal to his own.

In his mind no compromise was possible between truth and untruth.† Against authorities and influences he published *Man's Place in Nature*, though warned by his friends that to do so meant ruin to his prospects. When he had once led the way and challenged the upholders of conventional orthodoxy, others backed him up with a whole armoury of facts. But his fight was as far as possible for the truth itself, for fact, not merely for controversial victory or personal triumph. Yet, as has been said by a representative of a very different school of thought, who can wonder that he should have hit out straight from the shoulder, in reply to violent or insidious attacks, the stupidity of which sometimes merited scorn as well as anger?

In his theological controversies he was no less careful to avoid any approach to mere abuse or ribaldry such as some opponents of Christian dogma indulged in. For this reason he refused to interpose in the well-known Foote case. Discussion, he said, could be carried on effectually without deliberate wounding of others' feelings.

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\* The wording of a paragraph in Professor Mivart's "Reminiscences" (*Nineteenth Century*, December 1897, p. 993), tends, I think, to leave a wrong impression on this point.

† As he once said, when urged to write a more eulogistic notice of a dead friend than he thought deserved, "The only serious temptations to perjury I have ever known have arisen out of the desire to be of some comfort to people I cared for in trouble. If there are such things as Plato's 'Royal Lies' they are surely those which one is tempted to tell on such occasions. Mrs. — is such a good devoted little woman, and I am so doubtful about having a soul, that it seems absurd to hesitate to peril it for her satisfaction."

As he wrote in reply to an appeal for help in this case (March 12, 1883):—

I have not read the writings for which Mr. Foote was prosecuted. But, unless their nature has been grossly misrepresented, I cannot say that I feel disposed to intervene on his behalf.

I am ready to go great lengths in defence of freedom of discussion, but I decline to admit that rightful freedom is attacked, when a man is prevented from coarsely and brutally insulting his neighbours' honest beliefs.

I would rather make an effort to get legal penalties inflicted with equal rigour on some of the anti-scientific blasphemers—who are quite as coarse and unmannerly in their attacks on opinions worthy of all respect as Mr. Foote can possibly have been.

The grand result of his determination not to compromise where truth was concerned, was the securing freedom of thought and speech. One man after another, looking back on his work, declares that if we can say what we think now, it is because he fought the battle of freedom. Not indeed the battle of toleration, if toleration means toleration of error for its own sake. Error, he thought, ought to be extirpated by all legitimate means, and not assisted because it is conscientiously held.

As Lord Hobhouse wrote, soon after his death:—

I see now many laudatory notices of him in papers. But I have not seen, and I think the younger men do not know, that which (apart from science) I should put forward as his strongest claim to reverence and gratitude; and that is the steadfast courage and consummate ability with which he fought the battle of intellectual freedom, and insisted that people should be allowed to speak their honest convictions without being oppressed or slandered by the orthodox. He was one of those, perhaps the very foremost, who won that priceless freedom for us; and, as is too common, people enter into the labours of the brave, and do not even know what their elders endured, or what has been done for themselves.

With this went a proud independence of spirit, intolerant of patronage, careless of titular honours, indifferent to the accumulation of worldly wealth. He cared little even for

recognition of his work; "If I had £400 a year,"\* he exclaimed at the outset of his career, "I should be content to work anonymously for the advancement of science." The only recognition he considered worth having, was that of the scientific world; yet so little did he seek it, so little insist on questions of priority, that, as Professor Howes tells me, there are at South Kensington among the mass of unpublished drawings from dissections made by him, many which show that he had arrived at discoveries which afterwards brought credit to other investigators.

He was as ready to disclaim for himself any merits which really belonged to his predecessors, whether philosophical or scientific. He was too well read in their works not to be aware of the debt owed them by his own generation, and he reminded the world how little the scientific insight of Goethe, for instance, or the solid labours of Buffon or Réaumur or Lamarck, deserved oblivion.

The only point on which he did not claim recognition was the honesty of his motives. He was incapable of doing anything underhand, and he could not bear even the appearance of such conduct towards his friends, or those with whom he had business relations. In such cases he always took the bull by the horns, acknowledged an oversight or explained what was capable of misunderstanding. The choice between Edward Forbes and Hooker for the Royal Society's medal, or the explanations to Mr. Spencer for not joining a social reform league of which the latter was a prominent member, will serve as instances.

The most considerable difference I note among men (he wrote,) is not in their readiness to fall into error, but in their readiness to acknowledge these inevitable lapses.

For himself, he let no personal feelings stand in the way when fact negatived his theories: once convinced that they were untenable, he gave up *Bathybius* and the European origin of the Horse without hesitation.

The regard in which he was held by his friends was such

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\* A sum which might have supported a bachelor, but was entirely inadequate to the needs of a large family.

that he was sometimes appealed to by both parties in a dispute. He was a man to be trusted with the confidence of his friends. "Yes, you are quite right about 'loyal,'" he writes to Mr. Knowles, "I love my friends and hate my enemies—which may not be in accordance with the Gospel, but I have found it a good wearing creed for honest men." But he only regarded as "enemies" those whom he found to be double-dealers, shufflers, insincere, untrustworthy; a fair opponent he respected, and he could agree to differ with a friend without altering his friendship.

A lifelong impression of him was thus summed up by Dr. A. R. Wallace:—

I find that he was my junior by two years, yet he has always seemed to me to be the older, mainly no doubt, because from the very first time I saw him (now more than forty years ago), I recognised his vast superiority in ability, in knowledge, and in all those qualities that enable a man to take a foremost place in the world. I owe him thanks for much kindness and for assistance always cordially given, and although we had many differences of opinion, I never received from him a harsh or unkind word.

To those who could only judge him from his controversial literature, or from a formal business meeting, he often appeared hard and unsympathetic, but never to those who saw beneath the surface. In personal intercourse, if he disliked a man—and a strong individuality has strong likes and dislikes—he would merely veil his feelings under a superabundant politeness of the chilliest kind; but to any one admitted to his friendship he was sympathy itself. And thus, although I have heard him say that his friends, in the fullest sense of the word, could be reckoned on the fingers of one hand, the impression he made upon all who came within the circle of his friendship was such that quite a number felt themselves to possess his intimacy, and one wrote, after his death: "His many private friends are almost tempted to forget the public loss, in thinking of the qualities which so endeared him to them all."

Both the speculative and the practical sides of his intellect were strongly developed. On the one hand, he had

an intense love of knowledge, the desire to attain true knowledge of facts, and to organise them in their true relations. His contributions to pure science never fail to illustrate both these tendencies. His earlier researches brought to light new facts in animal life, and new ideas as to the affinities of the creatures he studied; his later investigations were coloured by Darwin's views, and in return contributed no little direct evidence in favour of evolution. But while the progress of the evolution theory in England owed more to his clear and unwearied exposition than to any other cause, while from the first he had indicated the points, such as the causes of sterility and variation, which must be cleared up by further investigation in order to complete the Darwinian theory, he did not add another to the many speculations since put forward.

On the other hand, intense as was his love of pure knowledge, it was balanced by his unceasing desire to apply that knowledge in the guidance of life. Always feeling that science was not solely for the men of science, but for the people, his constant object was to help the struggling world to ideas which should help them to think truly and so to live rightly. It is still true, he declared, that the people perish for want of knowledge. "If I am to be remembered at all," he writes (see Vol. I. p. 510), "I should like to be remembered as one who did his best to help the people." And again, he says in his *Autobiographical Sketch*, that other marks of success were as nothing if he could hope that he "had somewhat helped that movement of opinion which has been called the New Reformation."

This kind of aim in his work, of taking up the most fruitful idea of his time and bringing it home to all, is typified by his remark as he entered New York harbour on his visit to America in 1876, and watched the tugs hard at work as they traversed the bay. "If I were not a man," he said, "I think I should like to be a tug."

Two incidents may be cited to show that he did not entirely fail of appreciation among those whom he tried to help. Speaking of the year 1874, Professor Mivart writes

(Reminiscences of T. H. Huxley, *Nineteenth Century*, Dec. 1897):—

I recollect going with him and Mr. John Westlake, Q.C., to a meeting of artisans in the Blackfriars Road, to whom he gave a friendly address. He felt a strong interest in working-men, and was much beloved by them. On one occasion, having taken a cab home, on his arrival there, when he held out his fare to the cabman, the latter replied, "Oh no, Professor, I have had too much pleasure and profit from hearing you lecture to take any money from your pocket—proud to have driven you, sir!"

The other is from a letter to the *Pall Mall Gazette* of September 20, 1892, from Mr. Raymond Blaythwayt, on "The Uses of Sentiment":—

Only to-day I had a most striking instance of sentiment come beneath my notice. I was about to enter my house, when a plain, simply-dressed working-man came up to me with a note in his hand, and touching his hat, he said, "I think this is for you, sir," and then he added, "Will you give me the envelope, sir, as a great favour?" I looked at it, and seeing it bore the signature of Professor Huxley, I replied, "Certainly I will; but why do you ask for it?" "Well," said he, "it's got Professor Huxley's signature, and it will be something for me to show my mates and keep for my children. He have done me and my like a lot of good; no man more."

In practical administration, his judgment of men, his rapid perception of the essential points at issue, his observance of the necessary limits of official forms, combined with the greatest possible elasticity within these limits, made him extremely successful.

As Professor (writes the late Professor Jeffery Parker), Huxley's rule was characterised by what is undoubtedly the best policy for the head of a department. To a new subordinate, "The General," as he was always called, was rather stern and exacting, but when once he was convinced that his man was to be trusted, he practically let him take his own course; never interfered in matters of detail, accepted suggestions with the greatest courtesy and good humour, and was always ready with a kindly and humorous word of encouragement in times of difficulty. I was once grumbling to him about how hard it was to carry on the work of the laboratory through a long series of

November fogs, "when neither sun nor stars in many days appeared." "Never mind, Parker," he said, instantly capping my quotation, "cast four anchors out of the stern and wish for day."

Nothing, indeed, better illustrates this willingness to listen to suggested improvements than the inversion of the order of studies in the biological course which he inaugurated in 1872, namely, the substitution of the anatomy of a vertebrate for the microscopic examination of a unicellular organism as the opening study. This was entirely Parker's doing. "As one privileged at the time to play a minor part," writes Professor Howes (*Nature*, January 6, 1898, p. 228), "I well recall the determination in Parker's mind that the change was desirable, and in Huxley's, that it was not. Again and again did Parker appeal in vain, until at last, on the morning of October 2, 1878, he triumphed."

On his students he made a deep and lasting impression.

His lectures (writes Jeffery Parker) were like his writings, luminously clear, without the faintest disposition to descend to the level of his audience; eloquent, but with no trace of the empty rhetoric which so often does duty for that quality; full of a high seriousness, but with no suspicion of pedantry; lightened by an occasional epigram or flashes of caustic humour, but with none of the small jocularities in which it is such a temptation to a lecturer to indulge. As one listened to him one felt that comparative anatomy was indeed worthy of the devotion of a life, and that to solve a morphological problem was as fine a thing as to win a battle. He was an admirable draughtsman, and his blackboard illustrations were always a great feature of his lectures, especially when, to show the relation of two animal types, he would, by a few rapid strokes and smudges, evolve the one into the other before our eyes. He seemed to have a real affection for some of the specimens illustrating his lectures, and would handle them in a peculiarly loving manner; when he was lecturing on man, for instance, he would sometimes throw his arm over his shoulder of the skeleton beside him and take its hand, as if its silent companionship were an inspiration. To me his lectures before his small class at Jermyn Street or South Kensington were almost more impressive than the discourses at the Royal Institution, where for an hour and a half he poured forth a stream of dignified, earnest,

sincere words in perfect literary form, and without the assistance of a note.

Another description is from the pen of an old pupil in the autumn of 1876, Professor H. Fairfield Osborn, of Columbia College:—

Huxley, as a teacher, can never be forgotten by any of his students. He entered the lecture-room promptly as the clock was striking nine,\* rather quickly, and with his head bent forward "as if oppressive with its mind." He usually glanced attention to his class of about ninety, and began speaking before he reached his chair. He spoke between his lips, but with perfectly clear analysis, with thorough interest, and with philosophic insight which was far above the average of his students. He used very few charts, but handled the chalk with great skill, sketching out the anatomy of an animal as if it were a transparent object. As in Darwin's face, and as in Erasmus Darwin's or Buffon's, and many other anatomists with a strong sense of form, his eyes were heavily overhung by a projecting forehead and eyebrows, and seemed at times to look inward. His lips were firm and closely set, with the expression of positiveness, and the other feature which most marked him was the very heavy mass of hair falling over his forehead, which he would frequently stroke or toss back. Occasionally he would light up the monotony of anatomical description by a bit of humour.

Huxley was the father of modern laboratory instruction; but in 1879 he was so intensely engrossed with his own researches that he very seldom came through the laboratory, which was ably directed by T. Jeffery Parker, assisted by Howes and W. Newton Parker, all of whom are now professors, Howes having succeeded to Huxley's chair. Each visit, therefore, inspired a certain amount of terror, which was really unwarranted, for Huxley always spoke in the kindest tones to his students, although sometimes he could not resist making fun at their expense. There was an Irish student who sat in front of me, whose anatomical drawings in water-colour were certainly most remarkable productions. Huxley, in turning over his drawing-book, paused at a large blur, under which was carefully inscribed, "sheep's liver," and smilingly said, "I am glad to know that is a liver; it reminds me as much of Cologne cathedral in

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\* In most years the lectures began at ten.



a fog as of anything I have ever seen before." Fortunately the nationality of the student enabled him to fully appreciate the humour.

The same note is sounded in Professor Mivart's description of these lectures in his *Reminiscences* :—

The great value of Huxley's anatomical ideas, and the admirable clearness with which he explained them, led me in the autumn of 1861 to seek admission as a student to his course of lectures at the School of Mines in Jermyn Street. When I entered his small room there to make this request, he was giving the finishing touches to a dissection of part of the nervous system of a skate, worked out for the benefit of his students. He welcomed my application with the greatest cordiality, save that he insisted I should be only an honorary student, or rather, should assist at his lectures as a friend. I availed myself of his permission on the very next day, and subsequently attended almost all his lectures there and elsewhere, so that he one day said to me, "I shall call you my 'constant reader.'" To be such a reader was to me an inestimable privilege, and so I shall ever consider it. I have heard many men lecture, but I never heard anyone lecture as did Professor Huxley. He was my very ideal of a lecturer. Distinct in utterance, with an agreeable voice, lucid as it was possible to be in exposition, with admirably chosen language, sufficiently rapid, yet never hurried, often impressive in manner, yet never otherwise than completely natural, and sometimes allowing his audience a glimpse of that rich fund of humour ever ready to well forth when occasion permitted, sometimes accompanied with an extra gleam in his bright dark eyes, sometimes expressed with a dryness and gravity of look which gave it a double zest.

I shall never forget the first time I saw him enter his lecture-room. He came in rapidly, yet without bustle, and as the clock struck, a brief glance at his audience and then at once to work. He had the excellent habit of beginning each lecture (save, of course, the first) with a recapitulation of the main points of the preceding one. The course was amply illustrated by excellent coloured diagrams, which, I believe, he had made; but still more valuable were the chalk sketches he would draw on the black-board with admirable facility, while he was talking, his rapid, dexterous strokes quickly building up an organism in our minds, simultaneously through ear and eye. The lecture over, he was ever ready to answer questions, and I often admired his patience

n explaining points which there was no excuse for anyone not having understood.

Still more was I struck with the great pleasure which he showed when he saw that some special points of his teaching had not only been comprehended, but had borne fruit, by their suggestiveness in an appreciative mind.

To one point I desire specially to bear witness. There were persons who dreaded sending young men to him, fearing lest their young friends' religious beliefs should be upset by what they might hear said. For years I attended his lectures, but never once did I hear him make use of his position as a teacher to inculcate, or even hint at, his own theological views, or to depreciate or assail what might be supposed to be the religion of his hearers. No one could have behaved more loyally in that respect, and a proof that I thought so is that I subsequently sent my own son to be his pupil at South Kensington, where his experience confirmed what had previously been my own.

As to science, I learnt more from him in two years than I had acquired in any previous decade of biological study.

The picture is completed by Professor Howes in the *Students' Magazine* of the Royal College of Science:—

As a class lecturer Huxley was *facile princeps*, and only those who were privileged to sit under him can form a conception of his delivery. Clear, deliberate, never hesitant nor unduly emphatic, never repetitional, always logical, his every word told. Great, however, as were his class lectures, his workingmen's were greater. Huxley was a firm believer in the "distillatio per ascensum" of scientific knowledge and culture, and spared no pains in approaching the artisan and so-called "working classes." He gave the workmen of his best. The substance of his "Man's Place in Nature," one of the most successful and popular of his writings, and of his "Crayfish," perhaps the most perfect zoological treatise ever published, was first communicated to them. In one of the last conversations I had with him, I asked his views on the desirability of discontinuing the workmen's lectures at Jermyn Street, since the development of workingmen's colleges and institutes is regarded by some to have rendered their continuance unnecessary. He replied, almost with indignation, "With our central situation and resources, we ought to be in a position to give the workmen that which they cannot get elsewhere," adding that he would deeply deplore any such discontinuance.

And now, a word or two concerning Huxley's personal conduct towards his pupils, hearers, and subordinates.

As an examiner he was most just, aiming only to ascertain the examinee's knowledge of fundamentals, his powers of work, and the manner in which he had been taught. A country school lad came near the boundary line in the examination; though generally weak, his worst fault was a confusion of the parts of the heart. In his description of that organ he had transposed the valves. On appeal, Huxley let him through, observing, most characteristically, "Poor little beggar, I never got them correctly myself until I reflected that a bishop was never in the right." \* Again, a student of more advanced years, of the "mugging" type, who had come off with flying colours in an elementary examination, showed signs of uneasiness as the advanced one approached. "Stick an observation into him," said Huxley. It was stuck, and acted like a stiletto, a jump into the air and utter collapse being the result.

With his hearers Huxley was most sympathetic. He always assumed absolute ignorance on their part, and took nothing for granted. † When time permitted, he would remain after a lecture to answer questions; and in connection with his so doing his wonderful power of gauging and rising to a situation, once came out most forcibly. Turning to a student, he asked, "Well, I hope you understand it all." "All, sir, but one part, during which you stood between me and the blackboard," was the reply: the rejoinder, "I did my best to make myself clear, but could not render myself transparent." Quick of comprehension and of action, he would stand no nonsense. The would-be teacher who, wholly unfitted by nature for educational work, was momentarily dismissed, realised this, let us hope to his advantage. And the man suspected of taking notes of Huxley's lectures for publication unauthorised, probably learned the lesson of his life, on being reminded that, in the first place, a lecture was the property of the person who delivered it, and, in the second, he was not the first person who had mistaken aspiration for inspiration.

Though candid, Huxley was never unkind. . . .

Huxley never forgot a kindly action, never forsook a friend, nor allowed a labour to go unrewarded. In testimony to his sympathy to those about him and his self-sacrifice for the cause of science, it may be stated that in the old days, when the pro-

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\* The "mitral" valve being on the left side.

† This was a maxim on lecturing, adopted from Faraday.

fessors took the fees and disbursed the working expenses of the laboratories, he, doing this at a loss, would refund the fees of students whose position, from friendship or special circumstances, was exceptional.

As for his lectures and addresses to the public, they used to be thronged by crowds of attentive listeners.

Huxley's public addresses (writes Professor Osborn), always gave me the impression of being largely impromptu; but he once told me: "I always think out carefully every word I am going to say. There is no greater danger than the so-called *inspiration of the moment*, which leads you to say something which is not exactly true, or which you would regret afterwards."

Mr. G. W. Smalley has also left a striking description of him as a lecturer in the seventies and early eighties.

I used always to admire the simple and business-like way in which Huxley made his entry on great occasions. He hated anything like display, and would have none of it. At the Royal Institution, more than almost anywhere else, the lecturer, on whom the concentric circles of spectators in their steep amphitheatre look down, focuses the gaze. Huxley never seemed aware that anybody was looking at him. From self-consciousness he was, here as elsewhere, singularly free, as from self-assertion. He walked in through the door on the left, as if he were entering his own laboratory. In these days he bore scarcely a mark of age. He was in the full vigour of manhood and looked the man he was. Faultlessly dressed—the rule in the Royal Institution is evening costume—with a firm step and easy bearing, he took his place apparently without a thought of the people who were cheering him. To him it was an anniversary. He looked, and he probably was, the master. Surrounded as he was by the celebrities of science and the ornaments of London drawing-rooms, there was none who had quite the same kind of intellectual ascendancy which belonged to him. The square forehead, the square jaw, the tense lines of the mouth, the deep flashing dark eyes, the impression of something more than strength he gave you, an impression of sincerity, of solid force, of immovability, yet with the gentleness arising from the serene consciousness of his strength—all this belonged to Huxley and to him alone. The first glance magnetised his audience. The eyes were those of one accustomed to command,

of one having authority, and not fearing on occasion to use it. The hair swept carelessly away from the broad forehead and grew rather long behind, yet the length did not suggest, as it often does, effeminacy. He was masculine in everything—look, gesture, speech. Sparing of gesture, sparing of emphasis, careless of mere rhetorical or oratorical art, he had nevertheless the secret of the highest art of all, whether in oratory or whatever else—he had simplicity. The force was in the thought and the diction, and he needed no other. The voice was rather deep, low, but quite audible, at times sonorous, and always full. He used the chest-notes. His manner here, in the presence of this select and rather limited audience—for the theatre of the Royal Institution holds, I think, less than a thousand people—was exactly the same as before a great company whom he addressed at (Liverpool), as President of the British Association for the Advancement of Science. I remember going late to that, and having to sit far back, yet hearing every word easily; and there too the feeling was the same, that he had mastered his audience, taken possession of them, and held them to the end in an unrelaxing grip, as a great actor at his best does. There was nothing of the actor about him, except that he knew how to stand still, but masterful he ever was.

Up to the time of his last illness, he regularly breakfasted at eight, and avoided, as far as possible, going out to that meal, a “detestable habit” as he called it, which put him off for the whole day. He left the house about nine, and from that time till midnight at earliest was incessantly busy. His regular lectures involved an immensity of labour, for he would never make a statement in them which he had not personally verified by experiment. In the Jermyn Street days he habitually made preparations to illustrate the points on which he was lecturing, for his students had no laboratory in which to work out the things for themselves. His lectures to working-men also involved as much careful preparation as the more conspicuous discourses at the Royal Institution.

This thoroughness of preparation had no less effect on the teacher than on the taught. He writes to an old pupil:—

It is pleasant when the “bread cast upon the water” returns after many days; and if the crumbs given in my lectures have

had anything to do with the success on which I congratulate you, I am very glad.

I used to say of my own lectures that if nobody else learned anything from them, I did; because I always took a great deal of pains over them. But it is none the less satisfactory to find that there *were* other learners.

As for the ordinary course of a day's work, the more fitful energy and useless mornings of the earliest period in London were soon left behind. He was never one of those portentously early risers who do a fair day's work before other people are up; there was only one period, about 1873, when he had to be specially careful of his health, and, under Sir Andrew Clark's régime, took riding exercise for an hour each day before starting for South Kensington, that he records the fact of doing any work before breakfast, and that was letter-writing.

Much of the day during the session, and still more when his lectures were over, would thus be spent in original research, or in the examination and description of fossils in his official duty as Paleontologist to the Survey. As often as not, there would be a sitting of some Royal Commission to attend; committees of some learned society; meetings or dinners in the evening; if not, there would be an article to write or proofs to correct. Indeed, the greater part of the work by which the world knows him best was done after dinner, and after a long day's work in the lecture-room and laboratory.

He possessed a wonderful faculty for tearing out the heart of a book, reading it through at a gallop, but knowing what it said on all the points that interested him. Of verbal memory he had very little; in spite of all his reading I do not believe he knew half a dozen consecutive lines of poetry by heart. What he did know was the substance of what an author had written; how it fitted into his own scheme of knowledge; and where to find any point again when he wished to cite it.

In his biological studies his immense knowledge was firmly fixed in his mind by practical investigation; as is said above, he would take at second hand nothing for which

he vouched in his teaching, and was always ready to repeat for himself the experiments of others, which determined questions of interest to him. The citations, analyses, maps, with which he frequently accompanied his reading, were all part of the same method of acquiring facts and setting them in order within his mind. So careful, indeed, was he in giving nothing at second hand, that one of his scientific friends reproached him with wasting his time upon unnecessary scientific work, to which competent investigators had already given the stamp of their authority. "Poor —," was his comment afterwards, "if that is his own practice, his work will never live." On the literary side, he was omnivorous—consuming everything, as Mr. Spencer put it, from fairy tales to the last volume on metaphysics.

Unlike Darwin, to whom scientific research was at length the only thing engrossing enough to make him oblivious of his never-ending ill-health, to the gradual exclusion of other interests, literary and artistic, Huxley never lost his delight in literature or in art. He had a keen eye for a picture or a piece of sculpture, for, in addition to the draughtsman's and anatomist's sense of form, he had a strong sense of colour. To good music he was always susceptible.\* He played no instrument; as a young man, however, he used to sing a little, but his voice, though true, was never strong. But he had small leisure to devote to art. On his holidays he would sometimes sketch with a firm and rapid touch. His illustrations to the *Cruise of the Rattlesnake* show what his untrained capacities were. But to go to a concert or opera was rare after middle life; to go to the theatre rarer still, much as he appreciated a good play. His time was too deeply mortgaged; and in later life, the deafness which grew upon him added a new difficulty.

In poetry he was sensitive both to matter and form. One school of modern poetry he dismissed as "sensuous

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\* To one breaking in upon him at certain afternoon hours in his room at South Kensington, "a whiff of the pipe" (writes Professor Howes), "and a snatch of some choice melody or a Bach's fugue, were the not infrequent welcome."

caterwauling": a busy man, time and patience failed him to wade through the trivial discursiveness of so much of Wordsworth's verse; thus unfortunately he never realised the full value of a poet in whom the mass of ore bears so large a proportion to the pure metal. Shelley was too diffuse to be among his first favourites; but for simple beauty, Keats; for that, and for the comprehension of the meaning of modern science, Tennyson; for strength and feeling, Browning as represented by his earlier poems. These were the favourites among the moderns. He knew his eighteenth-century classics, but knew better his Milton and his Shakespeare, to whom he turned with ever-increasing satisfaction, as men do who have lived a full life.

His early acquaintance with German had given him a lasting admiration of the greatest representatives of German literature, Goethe above all, in whose writings he found a moral grandeur to be ranked with that of the Hebrew prophets. Eager to read Dante in the original, he spent much of his leisure on board the *Rattlesnake* in making out the Italian with the aid of a dictionary, and in this way came to know the beauties of the *Divina Commedia*. On the other hand, it was a scientific interest which led him in later life to take up his Greek, though one use he put it to was to read Homer in the original.

Though he was a great novel-reader, and, as he grew older, would always have a novel ready to take up for a while in the evening, his chief reading, in German and French as well as English, was philosophy and history.

His recreations were, as a rule, literary, and consisted in a change of mental occupation. The only times I can remember his playing an outdoor game are in the late sixties, when he started his elder children at cricket on the common at Littlehampton, and in 1871 when he played golf at St. Andrews. When first married, he promised his wife to reserve Saturday afternoons for recreation, and constantly went with her to the Ella concerts. She persuaded him also to take exercise by playing fives with Mr. Herbert Spencer; but the pressure of work before long absorbed all his time. In his youth he was extremely fond of chess, and



played eagerly with his fellow-students at Charing Cross Hospital or with his messmates on the *Rattlesnake*. But after he taught me the game, somewhere about 1869 or 1870, I do not think he ever found time for it again.

His principal exercise was walking during the holidays. In his earlier days especially, when overwrought by the stress of his life in London, he used to go off with a friend for a week's walking tour in Wales or the Lakes, in Brittany or the Eifel country, or in summer for a longer trip to Switzerland. In this way he "burnt up the waste products," as he would say, of his town life, and came back fresh for a new spell of unintermittent work.

But, on the whole, the amount of exercise he took was insufficient for his bodily needs. Even the riding prescribed for him when he first broke down, became irksome, and was not continued very long, although his bodily machine was such as could only be kept in perfect working order by more exercise than he would give. His physique was not adapted to burn up the waste without special stimulus. I remember once, as he and I were walking up Beachy Head, we passed a man with a splendid big chest. "Ah," said my father regretfully, "if I had only had a chest like that, what a lot of work I could have done."

When, in 1872, he built his new house in Marlborough Place, my father bargained for two points; one, that each member of the family should have a corner of his or her own, where, as he used to say, it would be possible to "consume their own smoke"; the other, that the common living-rooms should be of ample size. Thus from 1874 onwards he was enabled to see something of his many friends who would come as far as St. John's Wood on a Sunday evening. No formal invitation for a special day was needed. The guests came, sometimes more, sometimes fewer, as on any ordinary at-home day. There was a simple informal meal at 6.30 or 7 o'clock, which called itself by no more dignified name than high tea—was, in fact, a cold supper with varying possibilities in the direction of dinner or tea. It was a chance medley of old and young—friends of the parents and friends of the children, but all ultimately

centring round the host himself, whose end of the table never flagged for conversation, grave or gay.

Afterwards talk would go on in the drawing-room, or, on warm summer evenings, in the garden—nothing very extensive, but boasting a lawn with an old apple-tree at the further end, and in the borders such flowers and trees as endure London air. Later on, there was almost sure to be some music, to which my father himself was devoted. His daughters sang; a musical friend would be there; Mr. Herbert Spencer, a frequent visitor, was an authority on music. Once only do I recollect any other form of entertainment, and that was an occasion when Sir Henry Irving, then not long established at the Lyceum, was present and recited "Eugene Aram" with great effect.

In his *London Letters* Mr. G. W. Smalley\* has recorded his impressions of these evenings, at which he was often present:—

There used to be Sunday evening dinners and parties in Marlborough Place, to which people from many other worlds than those of abstract science were bidden; where talk was to be heard of a kind rare in any world. It was scientific at times, but subdued to the necessities of the occasion; speculative, yet kept within such bounds that bishop or archbishop might have listened without offence; political even, and still not commonplace; literary without pretence, and when artistic, free from affectation.

There and elsewhere Mr. Huxley easily took the lead if he cared to, or if challenged. Nobody was more ready in a greater variety of topics, and if they were scientific it was almost always another who introduced them. Unlike some of his comrades of the Royal Society, he was of opinion that man does not live by science alone, and nothing came amiss to him. All his life long he has been in the front of the battle that has raged between science and—not religion, but theology in its more dogmatic form. Even in private the alarm of war is sometimes heard, and Mr. Huxley is not a whit less formidable as a disputant across the table than with pen in hand. Yet an angry man must be very angry indeed before he could be angry with this adversary. He

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\* Another interesting account from the same pen is to be found in the article "Mr. Huxley," *Scribner's Magazine*, October 1895.

disarmed his enemies with an amiable grace that made defeat endurable if not entirely delightful.

As for his method of handling scientific subjects in conversation:—

He has the same quality, the same luminous style of exposition, with which his printed books have made all readers in America and England familiar. Yet it has more than that. You cannot listen to him without thinking more of the speaker than of his science, more of the solid beautiful nature than of the intellectual gifts, more of his manly simplicity and sincerity than of all his knowledge and his long services.

But his personality left the deepest impression, perhaps, upon those who studied under him and worked with him longest, before taking their place elsewhere in the front ranks of biological science.

With him (Professor A. Hubrecht \* writes), we his younger disciples, always felt that in acute criticism and vast learning nobody surpassed him, but still what we yet more admired than his learning was his wisdom. It was always a delight to read any new article or essay from his pen, but it was an ever so much higher delight to hear him talk for five minutes. His was the most beautiful and the most manly intellect I ever knew of.

So, too, Professor E. Ray Lankester:—

There has been no man or woman whom I have met on my journey through life, whom I have loved and regarded as I have him, and I feel that the world has shrunk and become a poor thing, now that his splendid spirit and delightful presence are gone from it. Ever since I was a little boy he has been my ideal and hero.

While the late Jeffery Parker concludes his Recollections with these words:—

Whether a professor is usually a hero to his demonstrator I cannot say; I only know that, looking back across an interval of many years and a distance of half the circumference of the globe, I have never ceased to be impressed with the manliness and sincerity of his character, his complete honesty of purpose,

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\* Of Utrecht University.

his high moral standard, his scorn of everything mean or shifty, his firm determination to speak what he held to be truth at whatever cost of popularity. And for these things "I loved the man, and do honour to his memory, on this side idolatry, as much as any."

Even those who scarcely knew him apart from his books, underwent the influence of that "determination to speak what he held to be truth." I may perhaps be allowed to quote in illustration two passages from letters to myself—one written by a woman, the other by a man:—

"'The surest-footed guide' is exactly true, to my feeling. Everybody else, among the great, used to disappoint one somewhere. He—never!"

"He was so splendidly brave that one can never repay one's debt to him for his example. He made all pretence about religious belief, and the kind of half-thinking things out, and putting up in a slovenly way with half-formed conclusions, seem the base thing which it really is."

## CHAPTER XXV

1895

I HAVE often regretted that I did not regularly take notes of my father's conversation, which was striking, not so much for the manner of it—though that was at once copious and crisp—as for the strength and substance of what he said. Yet the striking fact, the bit of philosophy, the closely knitted argument, were perfectly unstudied, and as in other most interesting talkers, dropped into the flow of conversation as naturally as would the more ordinary experiences of less richly stored minds.

However, in January 1895 I was staying at Eastbourne, and jotted down several fragments of talk as nearly as I could recollect them. Conversation not immediately noted down I hardly dare venture upon, save perhaps such an unforgettable phrase as this, which I remember his using one day as we walked on the hills near Great Hampden:—“It is one of the most saddening things in life that, try as we may, we can never be certain of making people happy, whereas we can almost always be certain of making them unhappy.”

*January 16.*—At lunch he spoke of Dr. Louis Robinson's experiments upon simian characteristics in new-born children. He himself had called attention before to the incurved feet of infants, but the power of hanging by the hands was a new and important discovery.\*

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\* Professor H. F. Osborn tells this story of his:—When a fond mother calls upon me to admire her baby, I never fail to respond; and while cooing appropriately, I take advantage of an opportunity to gently ascertain whether the soles of its feet turn in, and tend to support my theory of arboreal descent.”

He expressed his disgust with a certain member of the Psychical Research Society for his attitude towards spiritualism: "He doesn't believe in it, yet lends it the cover of his name. He is one of the people who talk of the 'possibility' of the thing, who think the difficulties of disproving a thing as good as direct evidence in its favour."

He thought it hard to be attacked for "the contempt of the man of science" when he was dragged into debate by Mr. Andrew Lang's *Common Sense and the Cock Lane Ghost*, he saying in a very polite letter: "I am content to leave Mr. Lang the Cock Lane Ghost if I may keep common sense." "After all," he added, "when a man has been through life and made his judgments, he must have come to a decision that there are some subjects it is not worth while going into."

January 18.—I referred to an article in the last *Nineteenth Century*, and he said:—"As soon as I saw it, I wrote, 'Knowles, my friend, you don't draw me this time. If a man goes on attributing statements to me which I have shown over and over again—giving chapter and verse—to be the contrary of what I did say, it is no good saying any more.'"

But would not this course of silence leave the mass of the British public believing the statements of the writer?

"The mass of the public will believe in ten years precisely the opposite of what they believe now. If a man is not a fool, it does him no harm to be believed one. If he really is a fool, it does matter. There never was book so derided and scoffed at as my first book, *Man's Place in Nature*, but it was true, and I don't know I was any the worse for the ridicule.

"People call me fond of controversy, but, as a fact, for the last twenty years at all events, I have never entered upon a controversy without some further purpose in view. As to Gladstone and his *Impregnable Rock*, it wasn't worth attacking them for themselves; but it was most important at that moment to shake him in the minds of sensible men.

"The movement of modern philosophy is back towards the position of the old Ionian philosophers, but strengthened

and clarified by sound scientific ideas. If I publish my criticism on Comte, I should have to re-write it as a summary of philosophical ideas from the earliest times. The thread of philosophical development is not on the lines usually laid down for it. It goes from Democritus and the rest to the Epicureans, and then the Stoics, who tried to reconcile it with popular theological ideas, just as was done by the Christian Fathers. In the Middle Ages it was entirely lost under the theological theories of the time; but reappeared with Spinoza, who, however, muddled it up with a lot of metaphysics which made him almost unintelligible.

“Plato was the founder of all the vague and unsound thinking that has burdened philosophy, deserting facts for possibilities, and then, after long and beautiful stories of what might be, telling you he doesn't quite believe them himself.

“A certain time since it was heresy to breathe a word against Plato; but I have a nice story of Sir Henry Holland. He used to have all the rising young men to breakfast, and turn out their latest ideas. One morning I went to breakfast with him, and we got into very intimate conversation, when he wound up by saying, ‘In my opinion Plato was an ass! But don't tell any one I said so.’”

We talked on geographical teaching; he began by insisting on the need of a map of the earth (on the true scale) showing the insignificance of all elevations and depressions on the surface. Secondly, one should take any place as centre, and draw about it circles of 50 or 100 miles radius, and see what lies within them; and note the extent of the influence exerted by the central point. At the same time, one should always compare the British Isles to scale. For instance, the Ægean is about as big as Britain; while the smallness of Judæa is remarkable. After the Exile, the Jewish part was about as big as the county of Gloucester. How few boys realise this, though they are taught classical geography.

“The real chosen people were the Greeks. One of the most remarkable things about them is not only the small-

ness, but the late rise of Attica, whereas Magna Græcia flourished in the eighth century. The Greeks were doing everything—piracy, trade, fighting, expelling the Persians. Never was there so large a number of self-governing communities.

“They fell short of the Jews in morality. How curious is the tolerant attitude of Socrates, like a modern man of the world talking to a young fellow who runs after the girls. The Jew, however he fell short in other respects, set himself a certain standard in cleanliness of life, and would not fall below it. The more creditable to him, because these vices were the offspring of the Semitic races among whom the Jew lived.

“There is a curious similarity between the position of the Jews in ancient times and what it is now. They were procurers and usurers among the Gentiles, yet many of them were singularly high-minded and pure. All too with an intense clannishness, the secret of their success, and a sense of superiority to the Gentile which would prevent the meanest Jew from sitting at table with a proconsul.

“The most remarkable achievement of the Jew was to impose on Europe for eighteen centuries his own superstitions—his ideas of the supernatural. Jahveh was no more than Zeus or Milcom; yet the Jew got established the belief in the inspiration of his Bible and his Law. If I were a Jew, I should have the same contempt as he has for the Christian who acted in this way towards me, who took my ideas and scorned me for clinging to them.”

*January 21.*—Yesterday evening he again declared that it was very hard for a man of peace like himself to have been dragged into so many controversies. “I declare that for the last twenty years I have never attacked, but always fought in self-defence, counting Darwin, of course, as part of myself, for dear Darwin never could nor would defend himself. Before that, I admit I attacked —, but I could not trust the man.” A pause. “No, there was one other case, when I attacked without being directly assailed, and that was Gladstone. But it was good for other reasons. It has always astonished me how a man after fifty or sixty



years of life among men could be so ignorant of the best way to handle his materials. If he had only read Dana, he would have found his case much better stated than ever he stated it. He seemed never to have read the leading authorities on his own side."

Speaking of the hesitation shown by the Senate of London University in grappling with a threatened obstacle to reform, he remarked: "It is very strange how most men will do anything to evade responsibility."

January 23.—At dinner the talk turned on plays. Mr. H. A. Jones had sent him *Judah*, which he thought good, though "there must be some hostility—except in the very greatest writers—between the dramatic and the literary faculties. I noticed many points I objected to, but felt sure they met with applause. Indeed in the theatre I have noticed that what I thought the worst blots on a piece invariably brought down the house."

He remarked how the French, in dramatic just as in artistic matters, are so much better than the English in composition, in avoiding anything slipshod in the details, though the English artists draw just as well and colour perhaps better.

The following sketch of human character is not actually a fragment of conversation, though it might almost pass for such; it comes from a letter to Mrs. W. K. Cilfford, of February 10, 1895:—

Men, my dear, are very queer animals, a mixture of horse-nervousness, ass-stubbornness and camel-malice—with an angel bobbing about unexpectedly like the apple in the posset, and when they can do exactly as they please, they are very hard to drive.

Whatever he talked of, his talk never failed to impress those who conversed with him. One or two such impressions have been recorded. Mr. Wilfrid Ward, whose interests lie chiefly in philosophy and theology, was his neighbour at Eastbourne, and in the *Nineteenth Century* for August 1896 has given various reminiscences of their friendly intercourse.

His conversation (he writes) was singularly finished, and (if I may so express it), clean cut; never long-winded or prosy; enlivened by vivid illustrations. He was an excellent *raconteur*, and his stories had a stamp of their own which would have made them always and everywhere acceptable. His sense of humour and economy of words would have made it impossible, had he lived to ninety, that they should ever have been disparaged as symptoms of what has been called "anecdoteage."

One drawback to conversation, however, he began to complain of during the later seventies.

It is a great misfortune (he remarked to Professor Osborn) to be deaf in only one ear. Every time I dine out the lady sitting by my good ear thinks I am charming, but I make a mortal enemy of the lady on my deaf side.

In ordinary conversation he never plunged at once into deep subjects. His welcome to the new-comer was always of the simplest and most unstudied. He had no mannerisms nor affectation of phrase. He would begin at once to talk on everyday topics; an intimate friend he would perhaps rally upon some standing subject of persiflage. But the subsequent course of conversation adapted itself to his company. Deeper subjects were reached soon enough by those who cared for them; with others he was quite happy to talk of politics or people or his garden, yet, whatever he touched, never failing to infuse into it an unexpected interest.

In this connection, a typical story was told me by a great friend of mine, whom we had come to know through his marriage with an early friend of the family. "Going to call at Hodeslea," he said, "I was in some trepidation, because I didn't know anything about science or philosophy; but when your mother began to talk over old times with my wife, your father came across the room and sat down by me, and began to talk about the dog which we had brought with us. From that he got on to the different races of dogs and their origin and connections, all quite simply, and not as though to give information, but just to talk about something which obviously interested me. I shall never forget how extraordinarily kind it was of your father to take all this trouble in entertaining a complete

stranger, and choosing a subject which put me at my ease at once, while he told me all manner of new and interesting things."

A few more fragments of his conversation have been preserved—the following by Mr. Wilfrid Ward. Speaking of Tennyson's conversation, he said:—

Doric beauty is its characteristic—perfect simplicity, without any ornament or anything artificial.

Telling how he had been to a meeting of the British Museum Trustees, he said:—

After the meeting, Archbishop Benson helped me on with my great-coat. I was *quite overcome* by this species of spiritual investiture. "Thank you, Archbishop," I said, "I feel as if I were receiving the *pallium*."

Speaking of two men of letters, with neither of whom he sympathised, he once said:—

Don't mistake me. One is a thinker and man of letters, the other is only a literary man. Erasmus was a man of letters, Gigadibs a literary man. A.B. is the incarnation of Gigadibs. I should call him *Gigadibsius Optimus Maximus*.

Another time, referring to Dean Stanley's historical impressionability, as militating against his sympathies with Colenso, he said:—

Stanley could believe in anything of which he had seen the supposed site, but was sceptical where he had not seen. At a breakfast at Monckton Milnes's, just at the time of the Colenso row, Milnes asked me my views on the Pentateuch, and I gave them. Stanley differed from me. The account of Creation in Genesis he dismissed at once as unhistorical; but the call of Abraham, and the historical narrative of the Pentateuch, he accepted. This was because he had seen Palestine—but he wasn't present at the Creation.

When he and Stanley met, there was sure to be a brisk interchange of repartee. One of these occasions, a ballot night at the Athenæum, has been recorded by the late Sir W. H. Flower:—

A well-known popular preacher of the Scotch Presbyterian Church, who had made himself famous by predictions of the speedy coming of the end of the world, was up for election. I was standing by Huxley when the Dean, coming straight from the ballot boxes, turned towards us. "Well," said Huxley, "have you been voting for C.?" "Yes, indeed I have," replied the Dean. "Oh, I thought the priests were always opposed to the prophets," said Huxley. "Ah!" replied the Dean, with that well-known twinkle in his eye, and the sweetest of smiles, "but you see, I do not believe in his prophecies, and some people say I am not much of a priest."

A few words as to his home life may perhaps be fitly introduced here. Towards his children he had the same union of underlying tenderness veiled beneath inflexible determination for what was right, which marked his intercourse with those outside his family.

As children we were fully conscious of this side of his character. We felt our little hypocrisies shrivel up before him; we felt a confidence in the infallible rectitude of his moral judgments which inspired a kind of awe. His arbitrament was instant and final, though rarely invoked, and was perhaps the more tremendous in proportion to its rarity. This aspect, as if of an oracle without appeal, was heightened in our minds by the fact that we saw but little of him. This was one of the penalties of his hard-driven existence. In the struggle to keep his head above water for the first fifteen or twenty years of his married life, he had scarcely any time to devote to his children. The "lodger," as he used to call himself at one time, who went out early and came back late, could sometimes spare half an hour just before or after dinner to draw wonderful pictures for the little ones, and these were memorable occasions. I remember that he used to profess a horror of being too closely watched, or of receiving suggestions, while he drew. "Take care, take care," he would exclaim, "or I don't know what it will turn into."

When I was seven years old I had the misfortune to be laid up with scarlet fever, and then his gift of drawing was a great solace to me. The solitary days—for I was the first

victim in the family—were very long, and I looked forward with intense interest to one half-hour after dinner, when he would come up and draw scenes from the history of a remarkable bull-terrier and his family that went to the seaside in a most human and child-delighting manner. I have seldom suffered a greater disappointment than when, one evening, I fell asleep just before this fairy half-hour, and lost it out of my life.

In those days he often used to take the three eldest of us out for a walk on Sunday afternoons, sometimes to the Zoological Gardens, more often to the lanes and fields between St. John's Wood and Hampstead or West End. For then the flood of bricks and mortar ceased on the Finchley Road just beyond the Swiss Cottage, and the West End Lane, winding solitary between its high hedges and rural ditches, was quite like a country road in holiday time, and was sometimes gladdened in June with real dog-roses, although the church and a few houses had already begun to encroach on the open fields at the end of the Abbey Road.

My father often used to delight us with sea stories and tales of animals, and occasionally with geological sketches suggested by the gravels of Hampstead Heath. But regular "shop" he would not talk to us, contrary to the expectation of people who have often asked me whether we did not receive quite a scientific training from his companionship.

At the Christmas dinner he invariably delighted the children by carving wonderful beasts, generally pigs, out of orange peel. When the marriage of his eldest daughter had taken her away from this important function, she was sent the best specimen as a reminder.

4 MARLBOROUGH PLACE, *Dec.* 25, 1878.

DEAREST JESS—We have just finished the mid-day Christmas dinner, at which function you were badly wanted. The inflammation of the pudding was highly successful—in fact Vesuvian not to say Ætnaic—and I have never yet attained so high a pitch in piggygenesis as on this occasion.

The specimen I enclose, wrapped in a golden cerecloth, and with the remains of his last dinner in the proper region, will prove to you the heights to which the creative power of the

true artist may soar. I call it a "Piggurne, or a Harmony in Orange and White."

Preserve it, my dear child, as evidence of the paternal genius, when those light and fugitive productions which are buried in the philosophical transactions and elsewhere are forgotten.

My best wishes to Fred and you, and may you succeed better than I do in keeping warm.—Ever your loving father,

T. H. HUXLEY.

Later on, however, the younger children who kept up the home at Marlborough Place after the elder ones had married or gone out into the world, enjoyed more opportunities of his ever-mellowing companionship. Strongly as he upheld the conventions when these represented some valid results of social experience, he was always ready to set aside his mere likes and dislikes on good cause shown; to follow reason as against the mere prejudice of custom, even his own.

Severe he might be on occasion, but never harsh. His idea in bringing up his children was to accustom them as early as possible to a certain amount of independence, at the same time trying to make them regard him as their best friend.

This aspect of his character is specially touched upon by Mr. Leslie Stephen, in a letter written to my mother in July 1895:—

No one, I think, could have more cordially admired Huxley's intellectual vigour and unflinching honesty than I. It pleases me to remember that I lately said something of this to him, and that he received what I said most heartily and kindly. But what now dwells most in my mind is the memory of old kindness, and of the days when I used to see him with you and his children. I may safely say that I never came from your house without thinking how good he is; what a tender and affectionate nature the man has! It did me good simply to see him. The recollection is sweet to me now, and I rejoice to think how infinitely better you know what I must have been dull indeed not more or less to perceive.

As he wrote to his son on his twenty-first birthday:—

You will have a son some day yourself, I suppose, and if you do, I can wish you no greater satisfaction than to be able to say that he has reached manhood without having given you a serious anxiety, and that you can look forward with entire confidence to his playing the man in the battle of life. I have tried to make you feel your responsibilities and act independently as early as possible—but, once for all, remember that I am not only your father but your nearest friend, ready to help you in all things reasonable, and perhaps in a few unreasonable.

This domestic happiness which struck others so forcibly was one of the vital realities of his existence. Without it his quick spirit and nervous temperament could never have endured the long and often embittered struggle—not merely with equanimity, but with a constant growth of sympathy for earnest humanity, which, in early days obscured from view by the turmoil of strife, at length became apparent to all as the tide of battle subsided. None realised more than himself what the sustaining help and comradeship of married life had wrought for him, alike in making his life worth living and in making his life's work possible. Here he found the pivot of his happiness and his strength; here he recognised to the full the care that took upon itself all possible burdens and left his mind free for his greater work.

He had always a great tenderness for children. "One of my earliest recollections of him," writes Jeffery Parker, "is in connection with a letter he wrote to my father, on the occasion of the death, in infancy, of one of my brothers. 'Why,' he wrote, 'did you not tell us before that the child was named after me, that we might have made his short life happier by a toy or two.' I never saw a man more crushed than he was during the dangerous illness of one of his daughters, and he told me that, having then to make an after-dinner speech, he broke down for the first time in his life, and for one painful moment forgot where he was and what he had to say. I can truly say that I never knew a man whose way of speaking of his family, or whose manner in his own home, was fuller of a noble, loving, and withal playful courtesy."

After he had retired to Eastbourne, his grandchildren reaped the benefit of his greater leisure. In his age his love of children brimmed over with undiminished force, unimpeded by circumstances. He would make endless fun with them, until one little mite, on her first visit, with whom her grandfather was trying to ingratiate himself with a vast deal of nonsense, exclaimed: "Well, you are the curious'test old man I ever seen."

Another, somewhat older, developed a great liking for astronomy under her grandfather's tuition. One day a visitor, entering unexpectedly, was astonished to find the pair of them kneeling on the floor in the hall before a large sheet of paper, on which the professor was drawing a diagram of the solar system on a large scale, with a little pellet and a large ball to represent earth and sun, while the child was listening with the closest attention to an account of the planets and their movements, which he knew so well how to make simple and precise without ever being dull.

Children seemed to have a natural confidence in the expression of mingled power and sympathy which, especially in his later years, irradiated his "square, wise, swarthy face,"\* and proclaimed to all the sublimation of a broad native humanity tried by adversity and struggle in the pursuit of noble ends. It was the confidence that an appeal would not be rejected, whether for help in distress, or for the satisfaction of the child's natural desire for knowledge.

Spirit and determination in children always delighted him. His grandson Julian, a curly-haired rogue, alternately cherub and pickle, was a source of great amusement and interest to him. The boy must have been about four years old when my father one day came in from the garden, where he had been diligently watering his favourite plants with a big hose, and said: "I like that chap! I like the way he

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\* "There never was a face, I do believe" (wrote Sir Walter Besant of the portrait by John Collier), "wiser, more kindly, more beautiful for wisdom and the kindness of it, than this of Huxley."—*The Queen*, Nov. 16, 1895.



Portrait with his Grandson, from a Photograph by  
Kent and Lacey, 1895.







looks you straight in the face and disobeys you. I told him not to go on the wet grass again. He just looked up boldly, straight at me, as much as to say, 'What do *you* mean by ordering me about?' and deliberately walked on to the grass."

The disobedient youth who so charmed his grandfather's heart was the prototype of Sandy in Mrs. Humphry Ward's *David Grieve*. When the book came out my father wrote to the author: "We are very proud of Julian's apotheosis. He is a most delightful imp, and the way in which he used to defy me on occasion, when he was here, was quite refreshing. The strength of his conviction that people who interfere with his freedom are certainly foolish, probably wicked, is quite Gladstonian."

A year after, when Julian had learned to write, and was reading the immortal *Water Babies*, wherein fun is poked at his grandfather's name among the authorities on water-babies and water-beasts of every description, he greatly desired more light as to the reality of water-babies. There is a picture by Linley Sambourne, showing my father and Owen examining a bottled water-baby under big magnifying glasses. Here, then, was a real authority to consult. So he wrote a letter of enquiry, first anxiously asking his mother if he would receive in reply a "proper letter" that he could read for himself, or a "wrong kind of letter" that must be read to him.

DEAR GRANDPATER—Have you seen a Waterbaby? Did you put it in a bottle? Did it wonder if it could get out? Can I see it some day?—Your loving

JULIAN.

To this he received the following reply from his grandfather, neatly printed, letter by letter, very unlike the orderly confusion with which his pen usually rushed across the paper—time being so short for such a multitude of writing—to the great perplexity, often, of his foreign correspondents.

HODESLEA,

STAVELEY ROAD,

EASTBOURNE.

March 24

1892.

My dear Julian

I never could make  
sure about that Water  
Baby. I have seen  
Babies in water and  
Babies in bottles; but  
the Baby in the water  
was not in a bottle and

the Baby in the Bottle was not in water.

My friend who wrote the story of the Water Baby, was a very kind man and very clever. Perhaps he thought I could see as much in the water as he did.

There are some people

who see a great deal  
and some who see very  
little in the same things.

When you grow up  
I dare say you will be  
one of the great-deal seers  
and see things more  
wonderful than Water  
Babies where other folks  
can see nothing



Give my best love to  
 Daddy + Mamma and  
 Trevenen - Grandmoo  
 is a little better but not  
 up yet -  
 Ever  
 your loving  
 Grandpater

Others of his family would occasionally receive elaborate pieces of nonsense, of which I give a couple of specimens. The following is to his youngest daughter:—

ATHENÆUM CLUB, *May 17, 1892.*

DEAREST BABS—As I was going along Upper Thames Street just now, I saw between Nos. 170 and 211 <sup>primary parenthesis</sup> (but you would like to know what I was going along that odorous street for. Well, it was to enquire how the pen with which I am now writing—<sup>2nd p.</sup> (you see it is a new-fangled fountain pen, warranted to cure the worst writing and always spell properly)<sup>2nd p</sup>)—works, because it

would not work properly this morning. And the nice young woman who took it from me—<sup>3rd p.</sup>(as who should say you old foodle!)<sup>3rd p.</sup> inked her own fingers enormously<sup>4th p.</sup> (which I told her I was pleased they were her fingers rather than mine)<sup>4th p.</sup>—But she only smole.<sup>5th p.</sup> (Close by was another shop where they sold hose—<sup>6 or 7 p.</sup>(indiarubber, not knitted)<sup>n. p.</sup>)—(and warranted to let water through, not keep it out); and I asked for a garden syringe, thinking such things likely to be kept by hosiers of that sort—and they said they had not any, but found they had a remnant cheap (price <sup>n. n. p.</sup>3s.) which is less than many people pay for the other hosiers' hose)<sup>end of pp.</sup> a doorpost at the side of the doorway of some place of business with this remarkable notice: RULING GIRLS WANTED.

Don't you think you had better apply at once? Jack will give you a character, I am sure, on the side of the art of ruling, and I will speak for the science—also of hereditary (on mother's side) instinct.

Well, I am not sure about the pen yet—but there is no room for any more.—Ever your loving  
DAD.

Epistolary composition on the model of a Gladstonian speech to a deputation on women's suffrage.

The other is to his daughter, Mrs. Harold Roller, who had sent him from abroad a friend's autograph-book for a signature:—

HODESLEA, EASTBOURNE, *Nov.* I, 1893.

The epistle of Thomas to the woman of the house of Harold.

1. I said it was an autograph-book; and so it was.
2. And naughty words came to the root of my tongue.
3. And the recording angel dipped his pen in the ink and squared his elbows to write.
4. But I spied the hand of the lovely and accomplished but vagabond daughter.
5. And I smole; and spoke not; nor uttered the naughty words.
6. So the recording angel was sold;
7. And was about to suck his pen.
8. But I said Nay! give it to me.

9. And I took the pen and wrote on the book of the Autographs letters pleasant to the eye and easy to read.
10. Such as my printers know not: nor the postman—nor the correspondent, who riseth in his wrath and curseth over my epistle ordinary.

This to his youngest daughter, which, in jesting form, conveys a good deal of sound sense, was the sequel to a discussion as to the advisability of a University education for her own and another boy:—

HODESLEA, EASTBOURNE, *May 9, 1892.*

DEAREST BABS—Bickers and Son have abased themselves, and assure me that they have fetched the Dicty. away and are sending it here. I shall believe them when it arrives.

As a rule, I do not turn up when I announce my coming, but I believe I shall be with you about dinner-time on Friday next (13th).

In the meanwhile, my good daughter, meditate these things:

1. Parents not too rich wish to send exceptionally clever, energetic lad to university—before taking up father's profession of architect.

2. E.c.e.l. will be well taught classics at school—not well taught in other things—will easily get a scholarship either at school or university. So much in parents' pockets.

3. E.c.e.l. will get as much mathematics, mechanics, and other needful preliminaries to architecture, as he wants (and a good deal more if he likes) at Oxford. Excellent physical school there.

4. Splendid Art museums at Oxford.

5. Prigs not peculiar to Oxford.

6. Don Cambridge would choke science (except mathematics) if it could as willingly as Don Oxford and more so.

7. Oxford always represents English opinion, in all its extremes, better than Cambridge.

8. Cambridge better for doctors, Oxford for architects, poets, painters, ~~and all that sort of cattle.~~

9. *Lawrence will go to Oxford* and become a real scholar, which is a great thing and a noble. He will combine the new and the old, and show how much better the world would have been if it had stuck to Hellenism. You are dreaming of the schoolboy who does not follow up his work, or becomes a mere poll man. Good enough for parsons, not for men. *Lawrence will go to Oxford.*—Ever your aggrawatin' PA.

Like the old Greek sage and statesman, my father might have declared that old age found him ever learning. Not indeed with the fiery earnestness of his young days of stress and storm; but with the steady advance of a practised worker who cannot be unoccupied. History and philosophy, especially biblical criticism, composed his chief reading in these later years.

Fortune had ceased her buffets; broken health was restored; and from his resting-place among his books and his plants he watched keenly the struggle which had now passed into other hands, still ready to strike a blow if need be, or even, on rare occasions, to return to the fighting line, as when he became a leader in the movement for London University reform.

His days at Eastbourne, then, were full of occupation, if not the occupation of former days. The day began as early; he never relaxed from the rule of an eight o'clock breakfast. Then a pipe and an hour and a half of letter-writing or working at an essay. Then a short expedition around the garden, to inspect the creepers, tend the saxifrages, or see how the more exposed shrubs could best be sheltered from the shrivelling winds. The gravelled terrace immediately behind the house was called the Quarterdeck; it was the place for a brisk patrolling in uncertain weather or in a north wind. In the lower garden was a parallel walk protected from the south by a high double hedge of cypress and golden elder, designed for shelter from the summer sun and southerly winds.

Then would follow another spell of work till near one o'clock; the weather might tempt him out again before lunch; but afterwards he was certain to be out for an hour or two from half-past two. However hard it blew, and Eastbourne is seldom still, the tiled walk along the sea-wall always offered the possibility of a constitutional. But the high expanse of the Downs was his favourite walk. The air of Beachy Head, 560 feet up, was an unfailing tonic. In the summer he used to keep a look-out for the little flowers of the short, close turf of the chalk which could remind him of his Alpine favourites, in particular the curious

phyteuma; and later on, in the folds of the hills where he had marked them, the English gentians.

After his walk, a cup of tea was followed by more reading or writing till seven; after dinner another pipe, and then he would return to my mother in the drawing-room, and settle down in his particular arm-chair, with some tough volume of history or theology to read, every now and again scoring a passage for future reference, or jotting a brief note on the margin. At ten he would migrate to the study for a final smoke before going to bed.

Such was his routine, broken by occasional visits to town on business, for he was still Dean of the Royal College of Science and a trustee of the British Museum. Old friends came occasionally to stay for a few days, and tea-time would often bring one or two of the small circle of friends whom he had made in Eastbourne. These also he occasionally visited, but he scarcely ever dined out. The talking was too tiring.

The change to Eastbourne cut away a whole series of interests, but it imported a new and very strong one into my father's life. His garden was not only a convenient ambulatory, but, with its growing flowers and trees, became a novel and intense pleasure, until he began "to think with *Candide* that 'Cultivons notre jardin' comprises the whole duty of man."

It was strange that this interest should have come suddenly at the end of his life. Though he had won the prize in Lindley's botanical class he had never been a field botanist till he was attracted by the Swiss gentians. As has been said before, his love of nature had never run to collecting either plants or animals. Mere "spider-hunters and hay-naturalists," as a German friend called them, he was inclined to regard as the camp-followers of science. It was the engineering side of nature, the unity of plan of animal construction, worked out in infinitely varying detail, which engrossed him. Walking once with Hooker in the Rhone valley, where the grass was alive with red and green grasshoppers, he said, "I would give anything to be as interested in them as you are."

But this feeling, unknown to him before, broke out in his gentian work. He told Hooker, "I can't express the delight I have in them." It continued undiminished when once he settled in the new house and laid out a garden. His especial love was for the rockery of Alpines, many of which came from Sir J. Hooker.

Here, then, he threw himself into gardening with characteristic ardour. He described his position as a kind of mean between the science of the botanist and the empiricism of the working gardener. He had plenty to suggest, but his gardener, like so many of his tribe, had a rooted mistrust of any gardening lore culled from books. "Books? They'll say anything in them books." And he shared, moreover, that common superstition, perhaps really based upon a question of labour, that watering of flowers, unnecessary in wet weather, is actively bad in dry. So my father's chief occupation in the garden was to march about with a long hose, watering, and watering especially his alpines in the upper garden and along the terraces lying below the house. The saxifrages and the creepers on the house were his favourite plants. When he was not watering the one he would be nailing up the other, for the winds of Eastbourne are remarkably boisterous, and shrivel up what they do not blow down. "I believe I shall take to gardening," he writes, a few months after entering the new house, "if I live long enough. I have got so far as to take a lively interest in the condition of my shrubs, which have been awfully treated by the long cold."

From this time his letters contain many references to his garden. He is astonished when his gardener asks leave to exhibit at the local show, but delighted with his pluck. Hooker jestingly sends him a plant "which will flourish on any dry, neglected bit of wall, so I think it will just suit you."

Great improvements have been going on (he writes in 1892), and the next time you come you shall walk in the "avenue" of four box-trees. Only five are to be had for love or money at present, but there are hopes of a sixth, and then the "avenue" will be full ten yards long! *Figurez vous ça!*

It was of this he wrote on October 1 :—

Thank Heaven we are settled down again and I can vibrate between my beloved books and even more beloved saxifrages.

The additions to the house are great improvements every way, outside and in, and when the conservatory is finished we shall be quite palatial; but, alas, of all my box-trees only one remains green, that is the "amari," or more properly "fusci" aliquid.

Sad things will happen, however. Although the local florists vowed that the box-trees would not stand the winds of Eastbourne, he was set on seeing if he could not get them to grow despite the gardeners, whom he had once or twice found false prophets. But this time they were right. Vain were watering and mulching and all the arts of the husbandman. The trees turned browner and browner every day, and the little avenue from terrace to terrace had to be ignominiously uprooted and removed.

A sad blow this, worse even than the following :—

A lovely clematis in full flower, which I had spent hours in nailing up, has just died suddenly. I am more inconsolable than Jonah!

He answers some gardening chaff of Sir Michael Foster's :—

Wait till I cut you out at the Horticultural. I have not made up my mind what to compete in yet. Look out when I do!

And when the latter offered to propose him for that Society, he replied :—

Proud an' 'appy should I be to belong to the Horticultural if you will see to it. Could send specimens of nailing up creepers if qualification is required.

After his long battlings for his early loves of science and liberty of thought, his later love of the tranquil garden seemed in harmony with the dignified rest from struggle. To those who thought of the past and the present, there was something touching in the sight of the old man whose unquenched fires now lent a gentler glow to the peaceful

retirement he had at length won for himself. His latter days were fruitful and happy in their unflagging intellectual interests, set off by the new delights of the *succidia altera*, that second resource of hale old age for many a century.

All through his last and prolonged illness, from earliest spring until midsummer, he loved to hear how the garden was getting on, and would ask after certain flowers and plants. When the bitter cold spring was over and the warm weather came, he spent most of the day outside, and even recovered so far as to be able to walk once into the lower garden and visit his favourite flowers. These children of his old age helped to cheer him to the last.



## APPENDIX I

As for this unfinished work, suggestive outlines left for others to fill in, Professor Howes writes to me in October 1899:—

Concerning the papers at S.K. which, as part of the contents of your father's book-shelves, were given by him to the College, and now are arranged, numbered, and registered in order for use, there is evidence that in 1858 he, with his needles and eye-glass, had dissected and carefully figured the so-called pronephros of the Frog's tadpole, in a manner which as to accuracy of detail anticipated later discovery. Again, in the early '80's, he had observed and recorded in a drawing the præ-pulmonary aortic arch of the Amphibian, at a period antedating the researches of Boas, which in connection with its discovery placed the whole subject of the morphology of the pulmonary artery of the vertebrata on its final basis, and brought harmony into our ideas concerning it.

Both these subjects lie at the root of modern advances in vertebrate morphology.

Concerning the skull, he was in the '80's back to it with a will. His line of attack was through the lampreys and hags and the higher cartilaginous fishes, and he was following up a revolutionary conception (already hinted at in his Hunterian Lectures in 1864, and later in a Royal Society paper on *Amphioxus* in 1875), that the trabeculæ cranii, judged by their relationships to the nerves, may represent a pair of præ-oral visceral arches. In his unpublished notes there is evidence that he was bringing to the support of this conclusion the discovery of a supposed 4th branch to the trigeminal nerve—the relationships of this (which he proposed to term the "hyporhinal" or palato-nasal division) and the ophthalmic (to have been termed the "orbitonasal"\*) to the trabecular arch and a supposed præ-

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\* A term already applied by him in 1875 to the corresponding nerve in the Batrachia. (*Ency. Brit.* 9th edition, vol. i., art. "Amphibia.")

mandibular visceral cleft, being regarded as repetitional of those of the maxillary and mandibular divisions to the mandibular cleft. So far as I am aware, von Kupffer is the only observer who has given this startling conclusion support, in his famous *Studien* (Hf. I. Kopf Acipenser, München, 1893), and from the nature of other recent work on the genesis of parts of the cranium hitherto thought to be wholly trabecular in origin, it might well be further upheld. As for the discovery of the nerve, I have been lately much interested to find that Mr. E. Phelps Allis, jun., an investigator who has done grand work in Cranial Morphology, has recently and independently arrived at a similar result. It was while working in my laboratory in July last that he mentioned the fact to me. Remembering that your father had published the aforementioned hints on the subject, and recalling conversations I had with him, it occurred to me to look into his unpublished MSS. (then being sorted), if perchance he had gone further. And, behold! there is a lengthy attempt to write the matter up in full, in which, among other things, he was seeking to show that, on this basis, the mode of termination of the notochord in the Craniata, and in the Branchiorto midæ (in which the trabecular arch is undifferentiated), is readily explained. Mr. Allis's studies are now progressing, and I have arranged with him that if, in the end, his results come sufficiently close to your father's, he shall give his work due recognition and publicity.

Among his schemes of the early '80's, there was actually commenced a work on the principles of Mammalian Anatomy and an Elementary Treatise on the Vertebrata. The former exists in the shape of a number of drawings with very brief notes, the latter to a slight extent only in MS. In the former, intended for the medical student and as a means of familiarising him with the anatomical "tree" as distinct from its surgical "leaves," your father once again returned to the skull, and he leaves a scheme for a revised terminology of its nerve exits worthy his best and most clear-headed endeavours of the past.\*

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\* Concerning this he wrote to Professor Howes in 1890 when giving him permission to denote two papers which he was about to present to the Zoological Society, as the first which emanated from the Huxley Research Laboratory:—"Pray do as you think best about the nomenclature. I remember when I began to work at the skull it seemed a hopeless problem, and years elapsed before I got hold of the clue."

And six weeks later, he writes: "You are always welcome to turn anything of mine to account, though I vow I do not just now recollect

And well do I remember how, in the '80's, both in the classroom and in conversation, he would emphasise the fact that the hypoglossus nerve roots of the mammal arise serially with the ventral roots of the spinal nerves, little thinking that the discovery by Froriep, in 1886, of their dorsal ganglionated counterparts, would establish the actual homology between the two, and by leading to the conclusion that though actual vertebræ do not contribute to the formation of the mammalian skull, its occipital region is of truncal origin, mark the most revolutionary advance in cranial morphology since his own of 1856.

Much of the final zoological work of his life lay with the Bony Fishes, and he leaves unfinished (indeed only just commenced) a memoir embodying a new scheme of classification of these, which shows that he was intending to do for them what he did for Birds in the most active period of his career. It was my good fortune to have helped as a hodman in the study of these creatures, with a view to a Text-book we were to have written conjointly, and as I realise what he was intending to make out of the dry facts, I am filled with grief at the thought of what we must have lost. His classification was based on the labours of years, as testified by a vast accumulation of rough notes and sketches, and as a conspicuous feature of it there stands the embodiment under one head of all those fishes having the swim-bladder in connection with the auditory organ by means of a chain of ossicles—a revolutionary arrangement, which later, in the hands of the late Dr. Sagemähl, and by his introduction of the famous term—"Ostariophyseæ," has done more than all else of recent years to clear the Ichthyological air. Your father had anticipated this unpublished, and in a proposal to unite the Herrings and Pikes into a single group, the "Clupesoces," he had further given promise of a new system, based on the study of the structure of the fins, jaws, and reproductive organs of the Bony Fishes, the classifications of which are still largely chaotic, which would have been as revolutionary as it was rational. New terms both in taxonomy and anatomy were contemplated, and in part framed. His published terms "Elasmo-" and "Cysto-arian" are the adjective form of two—far-reaching and significant—which give an idea of what was to have come. Similarly, the spinose fin-rays were to have been termed "*acanthonemes*," the branching and multiarticulate

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anything about the terms you mention. If you were to examine me in my own papers I believe I should be plucked."

"*arthronemes*," and those of the more elementary and "adipose fin" type "*protonemes*": and had he lived to complete the task, I question whether it would not have excelled his earlier achievements.

The Rabbit was to have been the subject of the first of the afore-mentioned books, and in the desire to get at the full meaning of problems which arose during its progress, he was led to digress into a general anatomical survey of the Rodentia, and in testimony to this there remain five or six books of rough notes bearing dates 1880 to 1884, and a series of finished pencil-drawings, which, as works of art and accurate delineations of fact, are among the most finished productions of his hand. In the same manner his contemplated work upon the Vertebrata led him during 1879-1880 to renewed investigation of the anatomy of some of the more aberrant orders. Especially as concerning the Marsupialia and Edentata was this the case, and to the end in view he secured living specimens of the Vulpine Phalanger, and purchased of the Zoological Society the Sloths and Ant-eaters which during that period died in their Gardens. These he carefully dissected, and he leaves among his papers a series of incomplete notes (fullest as concerning the Phalanger and Cape Ant-eater [*Orycteropus*] \*), which were never finished up.

They prove that he intended the production of special monographs on the anatomy of these peculiar mammalian forms, as he did on members of other orders which he had less fully investigated, and on the more important groups of fishes alluded to in the earlier part of my letter; and there seems no doubt, from the collocation of dates and study of the order of the events, that his memorable paper "On the Application of the Laws of Evolution to the arrangement of the Vertebrata, and more particularly of the Mammalia," published in the *Proc. Zool. Soc.* for 1880,—the most masterly among his scientific theses—was the direct outcome of this intention, the only expression which he gave to the world of the interaction of a series of revolutionary ideas and conceptions (begotten of the labours of his closing years as a working zoologist) which were

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\* I was privileged to assist in the dissection of the latter animal, and well do I remember how, when by means of a blow-pipe he had inflated the bladder, intent on determining its limit of distensibility, the organ burst, with unpleasant results, which called forth the remark, "I think we'll leave it at that!"

at the period assuming shape in his mind. They have done more than all else of their period to rationalise the application of our knowledge of the Vertebrata, and have now left their mark for all time on the history of progress, as embodied in our classificatory systems.

He was in 1882 extending his important observations upon the respiratory apparatus from birds to reptiles, with results which show him to have been keenly appreciative of the existence of fundamental points of similarity between the Avian and Chelonian types—a field which has been more recently independently opened up by Milani.

Nor must it be imagined that after the publication of his ideal work on the Crayfishes in 1880, he had forsaken the Invertebrata. On the contrary, during the late '70's, and on till 1882, he accumulated a considerable number of drawings (as usual with brief notes), on the Mollusca. Some are rough, others beautiful in every respect, and among the more conspicuous outcomes of the work are some detailed observations on the nervous system, and an attempt to formulate a new terminology of orientation of the Acephalous Molluscan body. The period embraces that of his research upon the *Spirula* of the *Challenger* expedition, since published; and incidentally to this he also accumulated a series of valuable drawings, with explanatory notes, of Cephalopod anatomy, which, as accurate records of fact, are unsurpassed.

As you are aware, he was practically the founder of the Anthropological Institute. Here again, in the late '60's and early '70's, he was most clearly contemplating a far-reaching inquiry into the physical anthropology of all races of mankind. There remain in testimony to this some 400 to 500 photographs (which I have had carefully arranged in order and registered), most of them of the nude figure standing erect, with the arm extended against a scale. A desultory correspondence proves that in connection with these he was in treaty with British residents and agents all over the world, with the Admiralty and naval officers, and that all was being done with a fixed idea in view. He was clearly contemplating something exhaustive and definite which he never fulfilled, and the method is now the more interesting from its being essentially the same as that recently and independently adopted by Mortillet.

Beyond this, your father's notes reveal numerous other indications of matters and phases of activity, of great interest in

their bearings on the history and progress of contemporary investigation, but these are of a detailed and wholly technical order.

## APPENDIX II

His administrative work as an officer of the Royal Society is described in the following note by Sir Joseph Hooker:—

Mr. Huxley was appointed Joint-Secretary of the Royal Society, November 30, 1871, in succession to Dr. Sharpey, Sir George Airy being President, and Professor (now Sir George) Stokes, Senior Secretary. He held the office till November 30, 1880. The duties of the office are manifold and heavy; they include attendance at all the meetings of the Fellows, and of the councils, committees, and sub-committees of the Society, and especially the supervision of the printing and illustrating all papers on biological subjects that are published in the Society's Transactions and Proceedings: the latter often involving a protracted correspondence with the authors. To this must be added a share in the supervision of the staff of officers, of the library and correspondence, and the details of house-keeping.

The appointment was well-timed in the interest of the Society, for the experience he had obtained as an officer in the Surveying Expedition of Captain Stanley rendered his co-operation and advice of the greatest value in the efforts which the Society had recently commenced to induce the Government, through the Admiralty especially, to undertake the physical and biological exploration of the ocean. It was but a few months before his appointment that he had been placed upon a committee of the Society, through which H.M.S. *Porcupine* was employed for this purpose in the European seas, and negotiations had already been commenced with the Admiralty for a voyage of circumnavigation with the same objects, which eventuated in the *Challenger* Expedition.

In the first year of his appointment, the equipment of the *Challenger*, and selection of its officers, was entrusted to the Royal Society, and in the preparation of the instructions to the naturalists Mr. Huxley had a dominating responsibility. In the same year a correspondence commenced with the India Office on the subject of deep-sea dredging in the Indian Ocean (it

came to nothing), and another with the Royal Geographical Society on that of a North Polar Expedition, which resulted in the Nares Expedition (1875). In 1873, another with the Admiralty on the advisability of appointing naturalists to accompany two of the expeditions about to be despatched for observing the transit of Venus across the sun's disk in Mauritius and Kerguelen, which resulted in three naturalists being appointed. Arduous as was the correspondence devolving on the Biological Secretary, through the instructing and instalment of these two expeditions, it was as nothing compared with the official, demi-official, and private, with the Government and individuals, that arose from the Government request that the Royal Society should arrange for the publication and distribution of the enormous collections brought home by the above-named expedition. It is not too much to say that Mr. Huxley had a voice in every detail of these publications. The sittings of the Committee of Publication of the *Challenger* Expedition collections (of which Sir J. D. Hooker was chairman, and Mr. Huxley the most active member) were protracted from 1876 to 1895, and resulted in the publication of fifty royal quarto volumes, with plates, maps, sections, etc., the work of seventy-six authors, every shilling of the expenditure on which (some £50,000) was passed under the authority of the Committee of Publication.

Nor was Mr. Huxley less actively interested in the domestic affairs of the Society. In 1873 the whole establishment was translated from the building subsequently occupied by the Royal Academy to that which it now inhabits in the same quadrangle; a flitting of library stuff and appurtenances involving great responsibilities on the officers for the satisfactory re-establishment of the whole institution. In 1874 a very important alteration of the bye-laws was effected, whereby that which gave to Peers the privilege of being proposed for election as Fellows, without previous selection by the Committee (and to which bye-laws, as may be supposed, Mr. Huxley was especially repugnant), was replaced by one restricting that privilege to Privy Counsellors. In 1875 he actively supported a proposition for extending the interests taken in the Society by holding annually a reception, to which the lady friends of the Fellows who were interested in science should be invited to inspect an exhibition of some of the more recent inventions, appliances and discoveries in science. And in the same year another reform took place in which he was no less interested, which was the abolition of the

entrance fees for ordinary Fellows, which had proved a bar to the coming forward of men of small incomes, but great eminence. The loss of income to the Society from this was met by a subscription of no less than £10,666, raised almost entirely amongst the Fellows themselves for the purpose.

In 1876 a responsibility, that fell heavily on the Secretaries, was the allotment annually of a grant by the Treasury of £4000, to be expended, under the direction of the Royal \* and other learned societies, on the advancement of science. Every detail of the business of this grant is undertaken by a large committee of the Royal and other scientific societies, which meets in the Society's rooms, and where all the business connected with the grant is conducted and the records kept.

### APPENDIX III

#### LIST OF ESSAYS, BOOKS, AND SCIENTIFIC MEMOIRS BY T. H. HUXLEY

##### ESSAYS

- "The Darwinian Hypothesis." (*Times*, December 26, 1859.)  
*Collected Essays*, ii.
- "On the Educational Value of the Natural History Sciences."  
(An Address delivered at St. Martin's Hall, on July 22, 1854, and published as a pamphlet in that year.) *Lay Sermons; Collected Essays*, iii.
- "Time and Life." (*Macmillan's Magazine*, December 1859.)
- "The Origin of Species." (*The Westminster Review*, April 1860.) *Lay Sermons; Collected Essays*, ii.
- "A Lobster: or the Study of Zoology." (A Lecture delivered at the South Kensington Museum in 1861, and subsequently published by the Department of Science and Art. Original title, "On the Study of Zoology.") *Lay Sermons; Collected Essays*, viii.
- "Geological Contemporaneity and Persistent Types of Life."  
(The Anniversary Address to the Geological Society for 1862.) *Lay Sermons; Collected Essays*, viii.

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\* It is often called a grant to the Royal Society. This is an error. The Royal Society, as such, in no way participates in this grant. The Society makes grants from funds in its own possession only.



- “Six Lectures to Working Men on Our Knowledge of the Causes of the Phenomena of Organic Nature, 1863.” *Collected Essays*, ii.
- “Man’s Place in Nature,” *see* List of Books. Republished, *Collected Essays*, vii.
- “Criticisms on ‘The Origin of Species.’” (The *Natural History Review*, 1864.) *Lay Sermons; Collected Essays*, ii.
- “Emancipation—Black and White.” (The *Reader*, May 20, 1865.) *Lay Sermons; Collected Essays*, iii.
- “On the Methods and Results of Ethnology.” (The *Fortnightly Review*, 1865.) *Critiques and Addresses; Collected Essays*, vii.
- “On the Advisableness of Improving Natural Knowledge.” (A Lay Sermon delivered in St. Martin’s Hall, January 7, 1866, and subsequently published in the *Fortnightly Review*.) *Lay Sermons; Collected Essays*, i.
- “A Liberal Education: and where to find it.” (An Address to the South London Working Men’s College, delivered January 4, 1868, and subsequently published in *Macmillan’s Magazine*.) *Lay Sermons; Collected Essays*, iii.
- “On a Piece of Chalk.” (A Lecture delivered to the working men of Norwich, during the meeting of the British Association, in 1868. Subsequently published in *Macmillan’s Magazine*.) *Lay Sermons; Collected Essays*, viii.
- “On the Physical Basis of Life.” (A Lay Sermon, delivered in Edinburgh, on Sunday, November 8, 1868, at the request of the late Rev. James Cranbrook; subsequently published in the *Fortnightly Review*.) *Lay Sermons; Collected Essays*, i.
- “The Scientific Aspects of Positivism.” (A Reply to Mr. Congreve’s Attack upon the Preceding Paper. Published in the *Fortnightly Review*, 1869.) *Lay Sermons*.
- “The Genealogy of Animals.” (A Review of Haeckel’s *Natürliche Schöpfungs-Geschichte*. The *Academy*, 1869.) *Critiques and Addresses; Collected Essays*, ii.
- “Geological Reform.” (The Anniversary Address to the Geological Society for 1869.) *Lay Sermons; Collected Essays*, viii.
- “Scientific Education: Notes of an After-Dinner Speech.” (Delivered before the Liverpool Philomathic Society in April 1869, and subsequently published in *Macmillan’s Magazine*.) *Lay Sermons; Collected Essays*, iii.

- “On Descartes’ ‘Discourse touching the Method of using one’s Reason rightly, and of seeking Scientific Truth.’” (An Address to the Cambridge Young Men’s Christian Society, delivered on March 24, 1870, and subsequently published in *Macmillan’s Magazine*.) *Lay Sermons; Collected Essays*, i.
- “On some Fixed Points in British Ethnology.” (The *Contemporary Review*, July 1870.) *Critiques and Addresses; Collected Essays*, vii.
- “Biogenesis and Abiogenesis.” (The Presidential Address to the British Association for the Advancement of Science, 1870.) *Critiques and Addresses; Collected Essays*, viii.
- “Paleontology and the Doctrine of Evolution.” (The Presidential Address to the Geological Society, 1870.) *Critiques and Addresses; Collected Essays*, viii.
- “On Medical Education.” (An Address to the Students of the Faculty of Medicine in University College, London, 1870.) *Critiques and Addresses; Collected Essays*, iii.
- “On Coral and Coral Reefs.” (*Good Words*, 1870.) *Critiques and Addresses*.
- “The School Boards: What they can do, and what they may do.” (The *Contemporary Review*, 1870.) *Critiques and Addresses; Collected Essays*, iii.
- “Administrative Nihilism.” (An Address delivered to the Members of the Midland Institute, on October 9, 1871, and subsequently published in the *Fortnightly Review*.) *Critiques and Addresses; Collected Essays*, i.
- “Mr. Darwin’s Critics.” (The *Contemporary Review*, November 1871.) *Critiques and Addresses; Collected Essays*, ii.
- “On the Formation of Coal.” (A Lecture delivered before the Members of the Bradford Philosophical Institution, and subsequently published in the *Contemporary Review*.) *Critiques and Addresses; Collected Essays*, viii.
- “Yeast.” (The *Contemporary Review*, December 29, 1871.) *Critiques and Addresses; Collected Essays*, viii.
- “Bishop Berkeley on the Metaphysics of Sensation.” (*Macmillan’s Magazine*, June 1871.) *Critiques and Addresses; Collected Essays*, vi.
- “The Problems of the Deep Sea” (1873). *Collected Essays*, viii.
- “Universities: Actual and Ideal.” (The Inaugural Address of the Lord Rector of the University of Aberdeen, February 27, 1874. *Contemporary Review*, 1874.) *Science and Culture; Collected Essays*, iii.

- “Joseph Priestley.” (An Address delivered on the Occasion of the Presentation of a Statue of Priestley to the Town of Birmingham on August 1, 1874.) *Science and Culture; Collected Essays*, iii.
- “On the Hypothesis that Animals are Automata, and its History.” (An Address delivered at the Meeting of the British Association for the Advancement of Science, at Belfast, 1874.) *Science and Culture; Collected Essays*, i.
- “On some of the Results of the Expedition of H.M.S. *Challenger*,” 1875. *Collected Essays*, viii.
- “On the Border Territory between the Animal and Vegetable Kingdoms.” (An Evening Lecture at the Royal Institution, Friday, January 28, 1876. *Macmillan's Magazine*, 1876.) *Science and Culture; Collected Essays*, viii.
- “Three Lectures on Evolution.” (New York, September 18, 20, 22, 1876.) *American Addresses; Collected Essays*, iv.
- “On the Study of Biology.” (A Lecture in connection with the Loan Collection of Scientific Apparatus at South Kensington Museum, December 16, 1876.) *American Addresses; Collected Essays*, iii.
- “Address on University Education.” (Delivered at the opening of the Johns Hopkins University, Baltimore, September 12, 1876.) *American Addresses; Collected Essays*, iii.
- “Elementary Instruction in Physiology.” (Read at the Meeting of the Domestic Economy Congress at Birmingham, 1877.) *Science and Culture; Collected Essays*, iii.
- “Technical Education.” (An Address delivered to the Working Men's Club and Institute, December 1, 1877.) *Science and Culture; Collected Essays*, iii.
- “Evolution in Biology.” (The *Encyclopædia Britannica*, ninth edition, vol. viii. 1878.) *Science and Culture; Collected Essays*, ii.
- “Hume,” 1878. *Collected Essays*, vi. See also under “Books.”
- “On Sensation and the Unity of Structure of the Sensiferous Organs.” (An Evening Lecture at the Royal Institution, Friday, March 7, 1879.) *Nineteenth Century*, April 1879. *Science and Culture; Collected Essays*, vi.
- “Prefatory Note to the Translation of E. Haeckel's Freedom in Science and Teaching,” 1879. (Kegan Paul.)
- “On Certain Errors respecting the Structure of the Heart attributed to Aristotle.” *Nature*, November 6, 1879. *Science and Culture*.

- "The Coming of Age of 'The Origin of Species.'" (An Evening Lecture at the Royal Institution, Friday, April 9, 1880.) *Science and Culture; Collected Essays*, ii.
- "On the Method of Zadig." (A Lecture delivered at the Working Men's College, Great Ormond Street, 1880. *Nineteenth Century*, June 1880.) *Science and Culture; Collected Essays*, iv.
- "Science and Culture." (An Address delivered at the Opening of Sir Josiah Mason's Science College, at Birmingham, on October 1, 1880.) *Science and Culture; Collected Essays*, iii.
- "The Connection of the Biological Sciences with Medicine." (An Address delivered at the Meeting of the International Medical Congress in London, August 9, 1881.) *Science and Culture; Collected Essays*, iii.
- "The Rise and Progress of Paleontology." (An Address delivered at the York Meeting of the British Association for the Advancement of Science, 1881.) *Controverted Questions; Collected Essays*, iv.
- "Charles Darwin." (Obituary Notice in *Nature*, April 1882.) *Collected Essays*, ii.
- "On Science and Art in Relation to Education." (An Address to the Members of the Liverpool Institution, 1882.) *Collected Essays*, iii.
- "The State and the Medical Profession." (The Opening Address at the London Hospital Medical School, 1884.) *Collected Essays*, iii.
- "The Darwin Memorial." (A Speech delivered at the Unveiling of the Darwin Statue at South Kensington, June 9, 1885.) *Collected Essays*, ii.
- "The Interpreters of Genesis and the Interpreters of Nature." (*Nineteenth Century*, December 1885.) *Controverted Questions; Collected Essays*, iv.
- "Mr. Gladstone and Genesis." (*Nineteenth Century*, February 1886.) *Controverted Questions; Collected Essays*, iv.
- "The Evolution of Theology: An Anthropological Study." (*Nineteenth Century*, March and April 1886.) *Controverted Questions; Collected Essays*, iv.
- "Science and Morals." (*Fortnightly Review*, November 1886.) *Controverted Questions; Collected Essays*, ix.
- "Scientific and Pseudo-Scientific Realism." (*Nineteenth Century*, February 1887.) *Controverted Questions; Collected Essays*, v.

- “Science and Pseudo-Science.” (*Nineteenth Century*, April 1887.) *Controverted Questions; Collected Essays*, v.
- “An Episcopal Trilogy.” (*Nineteenth Century*, November 1887.) *Controverted Questions; Collected Essays*, v.
- “Address on behalf of the National Association for the Promotion of Technical Education” (1887). *Collected Essays*, iii.
- “The Progress of Science” (1887). (Reprinted from *The Reign of Queen Victoria*, by T. H. Ward.) *Collected Essays*, i.
- “Darwin Obituary.” (*Proc. Roy. Soc.* 1888.) *Collected Essays*, ii.
- “The Struggle for Existence in Human Society.” (*Nineteenth Century*, February 1888.) *Collected Essays*, ix.
- “Agnosticism.” (*Nineteenth Century*, February 1889.) *Controverted Questions; Collected Essays*, v.
- “The Value of Witness to the Miraculous.” (*Nineteenth Century*, March 1889.) *Controverted Questions; Collected Essays*, v.
- “Agnosticism: A Rejoinder.” (*Nineteenth Century*, April 1889.) *Controverted Questions; Collected Essays*, v.
- “Agnosticism and Christianity.” (*Nineteenth Century*, June 1889.) *Controverted Questions; Collected Essays*, v.
- “The Lights of the Church and the Light of Science.” (*Nineteenth Century*, July 1890.) *Controverted Questions; Collected Essays*, iv.
- “The Keepers of the Herd of Swine.” (*Nineteenth Century*, December 1890.) *Controverted Questions; Collected Essays*, v.
- “Capital, the Mother of Labour.” (*Nineteenth Century*, March 1890.) *Collected Essays*, ix.
- “The Natural Inequality of Men.” (*Nineteenth Century*, January 1890.) *Collected Essays*, i.
- “Natural Rights and Political Rights.” (*Nineteenth Century*, February 1890.) *Collected Essays*, i.
- “Government: Anarchy or Regimentation.” (*Nineteenth Century*, May 1890.) *Collected Essays*, i.
- “Autobiography.” (1890, *Collected Essays*, i.) This originally appeared with a portrait in a series of biographical sketches by C. Engel.
- “The Aryan Question.” (*Nineteenth Century*, November 1890.) *Collected Essays*, vii.
- “Illustrations of Mr. Gladstone’s Controversial Methods.”

- Nineteenth Century*, March 1891.) *Controverted Questions; Collected Essays*, v.
- "Hasisadra's Adventure." (*Nineteenth Century*, June 1891.) *Controverted Questions; Collected Essays*, iv.
- "Possibilities and Impossibilities." (The *Agnostic Annual* for 1892.) 1891, *Collected Essays*, v.
- "Social Diseases and Worse Remedies" (1891). Letters to the *Times*, December 1890 and January 1891. Published in pamphlet form (Macmillan & Co.) 1891. *Collected Essays*, ix.
- "An Apologetic Irenicon." (*Fortnightly Review*, November 1892.)
- "Prologue to 'Controverted Questions'" (1892). *Controverted Questions; Collected Essays*, v.
- "Evolution and Ethics," being the Romanes Lecture for 1893. Also "Prolegomena," 1894. *Collected Essays*, ix.
- "Owen's Position in Anatomical Science," being a chapter in the *Life of Sir Richard Owen*, by his grandson, the Rev. Richard Owen (1894).

## BOOKS

- "Kölliker's Manual of Human Histology." (Translated and edited by T. H. Huxley and G. Busk), 1853.
- "Evidence as to Man's Place in Nature," 1863.
- "Lectures on the Elements of Comparative Anatomy" (one volume only published), 1864.
- "Elementary Atlas of Comparative Osteology" (in 12 plates), 1864.
- "Lessons in Elementary Physiology." First edition printed 1866; second edition, 1868; reprinted 1869, 1870, 1871, 1872 (twice); third edition, 1872; reprinted 1873, 1874, 1875, 1876, 1878, 1879, 1881, 1883, 1884 (six times); fourth edition, 1885; reprinted 1886, 1888, 1890, 1892, 1893 (twice), 1896, 1898.
- "An Introduction to the Classification of Animals," 1869.
- "Lay Sermons, Addresses, and Reviews." First edition printed 1870; second edition, 1871; reprinted 1871, 1872, 1874, 1877, 1880, 1883; third edition, 1887; reprinted 1891, 1893, (twice), 1895, 1899.
- "Essays Selected from Lay Sermons, Addresses, and Reviews." First edition, 1871; reprinted 1874, 1877.
- "Manual of the Anatomy of Vertebrated Animals," 1871 (Churchill).

- “Critiques and Adresses.” First edition printed 1873; reprinted 1883 and 1890.
- “A Course of Practical Instruction in Elementary Biology.” By Prof. Huxley and Dr. H. N. Martin. First edition printed 1875; second edition, 1876; reprinted 1877 (twice), 1879 (twice), 1881, 1882, 1883, 1885, 1886 (three times), 1887; third edition, edited by Messrs. Howes and Scott, 1887; reprinted 1889, 1892, 1898.
- “American Addresses.” First edition printed 1877; reprinted 1886.
- “Anatomy of Invertebrated Animals,” 1877.
- “Physiography.” First edition, 1877; reprinted 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885 (three times), 1887, 1888, 1890, 1891, 1893, 1897.
- “Hume.” English Men of Letters Series. First edition printed 1878; reprinted 1879 (twice), 1881, 1886, 1887, 1895.
- “The Crayfish: an Introduction to the Study of Zoology,” 1879.
- “Evolution and Ethics.” First edition printed 1893; reprinted 1893 (three times); second edition, 1893; third edition, 1893; reprinted 1894.
- “Introductory Science Primer.” First edition printed 1880; reprinted 1880, 1886, 1888, 1889 (twice), 1893, 1895, 1899.
- “Science and Culture, and other Essays.” First edition printed 1881; reprinted 1882, 1888.
- “Social Diseases and Worse Remedies.” First edition printed 1891; reprinted, with additions, 1891 (twice).
- “Essays on some Controverted Questions.” Printed in 1892.
- Collected Essays. Vol. I. “Method and Results.” First edition printed 1893; reprinted 1894, 1898.
- Vol. II. “Darwiniana.” First edition printed 1893; reprinted 1894.
- Vol. III. “Science and Education.” First edition printed 1893; reprinted 1895.
- Vol. IV. “Science and Hebrew Tradition.” First edition printed 1893; reprinted 1895, 1898.
- Vol. V. “Science and Christian Tradition.” First edition printed 1894; reprinted 1895, 1897.
- Vol. VI. “Hume, with Helps to the Study of Berkeley.” First edition printed 1894; reprinted 1897.
- Vol. VII. “Man’s Place in Nature.” First printed for Macmillan and Co. in 1894; reprinted 1895, 1897.
- Vol. VIII. “Discourses, Biological and Geological.” First edition printed 1894; reprinted 1896.

- Vol. IX. "Evolution and Ethics and other Essays." First edition printed 1894; reprinted 1895, 1898.  
 "Scientific Memoirs," vol. i. printed 1898, vol. ii. printed 1899, vols. iii. and iv. to follow.

## SCIENTIFIC MEMOIRS

- "On a Hitherto Undescribed Structure in the Human Hair Sheath," *Lond. Medical Gazette*, i. 1340 (July 1845).  
 "Examination of the Corpuscles of the Blood of *Amphioxus Lanceolatus*," *Brit. Assoc. Report* (1847), pt. ii. 95; *Sci. Mem.* i.  
 "Description of the Animal of *Trigonia*," *Proc. Zool. Soc.* vol. xvii. (1849), 30-32; also in *Ann. and Mag. of Nat. Hist.* v. (1850), 141-143; *Sci. Mem.* i.  
 "On the Anatomy and the Affinities of the Family of the *Medusæ*," *Phil. Trans. Roy. Soc.* (1849), pt. ii. 413; *Sci. Mem.* i.  
 "Notes on *Medusæ* and *Polypes*," *Ann. and Mag. of Nat. Hist.* vi. (1850), 66, 67; *Sci. Mem.* i.  
 "Observations sur la Circulation du Sang chez les Mollusques des Genres *Firole* et *Atlante*." (Extraites d'une lettre adressée à M. Milne-Edwards.) *Annales des Sciences Naturelles*, xiv. (1850), 193-195; *Sci. Mem.* i.  
 "Observations upon the Anatomy and Physiology of *Salpa* and *Pyrosoma*," *Phil. Trans. Roy. Soc.* (1851), pt. ii. 567-594; also in *Ann. and Mag. of Nat. Hist.* ix. (1852), 242-244; *Sci. Mem.* i.  
 "Remarks upon *Appendicularia* and *Doliolum*, two Genera of the *Tunicata*," *Phil. Trans. Roy. Soc.* (1851), pt. ii. 595-606; *Sci. Mem.* i.  
 "Zoological Notes and Observations made on board H.M.S. *Rattlesnake* during the years 1848-1850," *Ann. and Mag. Nat. Hist.* vii. ser. ii. (1851), 304-306, 370-374; vol. viii. 433-442; *Sci. Mem.* i.  
 "Observations on the Genus *Sagitta*," *Brit. Assoc. Report* (1851), pt. ii. 77, 78 (sectional transactions); *Sci. Mem.* i.  
 "An Account of Researches into the Anatomy of the Hydrostatic *Acalephæ*," *Brit. Assoc. Report* (July 1851), pt. ii. 78-80 (sectional transactions); *Sci. Mem.* i.  
 "Description of a New Form of Sponge-like Animal," *Brit. Assoc. Report* (July 1851), pt. ii. 80 (sectional transactions); *Sci. Mem.* i.



- “Report upon the Researches of Prof. Müller into the Anatomy and Development of the Echinoderms,” *Ann. and Mag. of Nat. Hist.* ser. ii. vol. viii. (1851), 1-19; *Sci. Mem.* i.
- “Ueber die Sexualorgane der Diphyidae und Physophoridae,” Müller's *Archiv für Anatomie, Physiologie, und Wissenschaftliche Medicin* (1851), 380-384. *Sci. Mem.* i.
- “Lacinularia Socialis: A Contribution to the Anatomy and Physiology of the Rotifera,” *Trans. Micr. Soc.*, Lond., new series, i. (1853), 1-19; (Read December 31, 1851). *Sci. Mem.* i.
- “Upon Animal Individuality,” *Proc. Roy. Inst.* i. (1851-54), 184-189. (Abstract of a Friday evening discourse delivered on 30th April 1852.) *Sci. Mem.* i.
- “On the Morphology of the Cephalous Mollusca, as Illustrated by the Anatomy of certain Heteropoda and Pteropoda collected during the voyage of H.M.S. *Rattlesnake* in 1846-50,” *Phil. Trans. Roy. Soc.* cxliii. (1853), part i. 29-66. *Sci. Mem.* i.
- “Researches into the Structure of the Ascidians,” *Brit. Assoc. Report* (1852), part ii. 76-77. *Sci. Mem.* i.
- “On the Anatomy and Development of Echinococcus Veterinorum,” *Proc. Zool. Soc.* xx. (1852), 110-126. *Sci. Mem.* i.
- “On the Identity of Structure of Plants and Animals”; Abstract of a Friday evening discourse delivered at the Royal Institution on April 15, 1853; *Proc. Roy. Inst.* i. (1851-54), 298-302; *Edinburgh New Phil. Jour.* liii. (1852), 172-177. *Sci. Mem.* i.
- “Observations on the Existence of Cellulose in the Tunic of Ascidians,” *Quart. Jour. Micr. Sci.* i. 1853; *Sci. Mem.* i.
- “On the Development of the Teeth, and on the Nature and Import of Nasmyth's ‘Persistent Capsule,’” *Quart. Jour. Micr. Sci.* i. 1853. *Sci. Mem.* i.
- “The Cell-Theory (Review),” *Brit. and For. Med. Chir. Review*, xii. (1853), 285-314. *Sci. Mem.* i.
- “On the Vascular System of the Lower Annulosa,” *Brit. Assoc. Report* (1854), part ii. p. 109. *Sci. Mem.* i.
- “On the Common Plan of Animal Forms.” Abstract of a Friday evening discourse delivered at the Royal Institution on May 12, 1854.) *Proc. Roy. Inst.* i. (1851-54), 444-446. *Sci. Mem.* i.
- “On the Structure and Relation of the Corpuscula Tactus (Tactile Corpuscles or Axile Corpuscles) and of the Pacinian Bodies,” *Quart. Jour. Micr. Sci.* ii. (1853), 1-7. *Sci. Mem.* i.

- “On the Ultimate Structure and Relations of the Malpighian Bodies of the Spleen and of the Tonsillar Follicles,” *Quart. Jour. Micr. Sci.* ii. (1854), 74-82. *Sci. Mem.* i.
- “On certain Zoological Arguments commonly adduced in favour of the Hypothesis of the Progressive Development of Animal Life in Time.” (Abstract of a Friday evening discourse delivered on April 20, 1855.) *Proc. Roy. Inst.* ii. (1854-58), 82-85. *Sci. Mem.* i.
- “On Natural History as Knowledge, Discipline, and Power,” *Roy. Inst. Proc.* ii. (1854-58), 187-195. (Abstract of a discourse delivered on Friday, February 15, 1857.) *Sci. Mem.* i.
- “On the Present State of Knowledge as to the Structure and Functions of Nerve,” *Proc. Roy. Inst.* ii. (1854-58), 432-437. (Abstract of a discourse delivered on Friday, May 15, 1857.) *Sci. Mem.* i.
- (Translation) “On Tape and Cystic Worms,” von Siebold (1857), for the Sydenham Society.
- “Contributions to *Icones Zootomicae*,” by Victor Carus (1857).
- “On the Phenomena of Gemmation.” (Abstract of a discourse delivered on Friday, May 21, 1858.) *Proc. Roy. Inst.* ii. (1854-58), 534-538; *Silliman's Journal*, xxviii. (1859), 206-209. *Sci. Mem.* i.
- “Contributions to the Anatomy of the Brachiopoda,” *Proc. Roy. Soc.* vii. (1854-55), 106-117; 241, 242. *Sci. Mem.* i.
- “On Hermaphrodite and Fissiparous Species of Tubicolar Annelidae (Protula Dysteri),” *Edin. New Phil. Jour.* i. (1855), 113-129. *Sci. Mem.* i.
- “On the Structure of Noctiluca Miliaris,” *Quart. Jour. Micr. Soc.* iii. (1855), 49-54. *Sci. Mem.* i.
- “On the Enamel and Dentine of the Teeth,” *Quart. Jour. Micr. Soc.* iii. (1855), 127-130. *Sci. Mem.* i.
- “Memoir on Physalia,” *Proc. Linn. Soc.* ii. (1855), 3-5. *Sci. Mem.* i.
- “On the Anatomy of Diphyes, and on the Unity of Composition of the Diphyidae and Physophoridae, etc.,” *Proc. Linn. Soc.* ii. (1855), 67-69. *Sci. Mem.* i.
- “Tegumentary Organs,” *The Cyclopædia of Anatomy and Physiology*, edited by Robert B. Todd, M.D., F.R.S. (The fascicules containing this article were published between August 1855 and October 1856.) *Sci. Mem.* i.
- “On the Method of Palæontology,” *Ann. and Mag. of Nat. Hist.* xviii. (1856), 43-54. *Sci. Mem.* i.

- "Observations on the Structure and Affinities of Himantopteris," *Quart. Jour. Geol. Soc.* xii. (1856), 34-37. *Sci. Mem.* i.
- "Further Observations on the Structure of Appendicula Flabellum (Chamisso)," *Quart. Jour. Micr. Soc.* iv. (1856), 181-191. *Sci. Mem.* i.
- "Note on the Reproductive Organs of the Cheilostome Polyzoa," *Quart. Jour. Micr. Soc.* iv. (1856), 191, 192. *Sci. Mem.* i.
- "Description of a New Crustacean (Pygocephalus Cooperi, Huxley) from the Coal-measures," *Quart. Jour. Geol. Soc.* xiii. (1857), 363-369. *Sci. Mem.* i.
- "On Dysteria, a New Genus of Infusoria," *Quart. Jour. Micr. Soc.* v. (1857), 78-82. *Sci. Mem.* i.
- "Review of Dr. Hannover's Memoir: *Ueber die Entwicklung und den Bau des Säugethierzahns*," *Quart. Jour. Micr. Soc.* v. (1857), 166-171. *Sci. Mem.* i.
- "Letter to Mr. Tyndall on the Structure of Glacier Ice," *Phil. Mag.* xiv. (1857), 241-260. *Sci. Mem.* i.
- "On Cephalaspis and Pteraspis," *Quart. Jour. Geol. Soc.* xiv. (1858), 267-280. *Sci. Mem.* i.
- "Observations on the Genus Pteraspis," *Brit. Assoc. Report* (1858), part ii. 82, 83. *Sci. Mem.* i.
- "On a New Species of Plesiosaurus (P. Etheridgii) from Street, near Glastonbury; with Remarks on the Structure of the Atlas and the Axis Vertebrae and of the Cranium in that Genus," *Quart. Jour. Geol. Soc.* xiv. (1853), 281-94. *Sci. Mem.* i.
- "On the Theory of the Vertebrate Skull," *Proc. Roy. Soc.* ix. (1857-59), 381-457; *Ann. and Mag. of Nat. Hist.* iii. (1859), 414-39. *Sci. Mem.* i.
- "On the Structure and Motion of Glaciers," *Phil. Trans. Roy. Soc.* cxlvii. (1857), 327-346. (Received and read January 15, 1857.) *Sci. Mem.* ii.
- "On the Agamic Reproduction and Morphology of Aphis," *Trans. Linn. Soc.* xxii. (1858), 193-220, 221-236. (Read November 5, 1857.) *Sci. Mem.* ii.
- "On Some Points in the Anatomy of Nautilus Pompilius," *Jour. Linn. Soc.* iii. (1859), (*Zool.*), 36-44. (Read June 3, 1858.) *Sci. Mem.* ii.
- "On the Persistent Types of Animal Life," *Proc. Roy. Inst. of Great Britain*, iii. (1858-62), 151-153. Friday, June 3, 1859.) *Sci. Mem.* ii.

- “On the *Stagonolepis Robertsoni* (Agassiz) of the Elgin Sandstones; and on the Recently Discovered Footmarks in the Sandstones of Cummingstone,” *Quart. Jour. Geol. Soc.* xv. (1859), 440-460. *Sci. Mem.* ii.
- “On Some Amphibian and Reptilian Remains from South Africa and Australia,” *Quart. Jour. Geol. Soc.* xv. (1859), 642-649. (Read March 3, 1859.) *Sci. Mem.* ii.
- “On a New Species of *Dicynodon* (*D. Murrayi*) from near Colesberg, South Africa; and on the Structure of the Skull in the *Dicynodonts*,” *Quart. Jour. Geol. Soc.* xv. (1859), 649-658. (Read March 23, 1859.) *Sci. Mem.* ii.
- “On *Rhamphorhynchus Bucklandi*, a Pterosaurian from the Stonesfield Slate,” *Quart. Jour. Geol. Soc.* xv. (1859), 658-670. (Read March 23, 1859.) *Sci. Mem.* ii.
- “On a Fossil Bird and a Fossil Cetacean from New Zealand,” *Quart. Jour. Geol. Soc.* xv. (1859), 670-677. (Read March 23, 1859.) *Sci. Mem.* ii.
- “On the Dermal Armour of *Crocodylus Hastingsiæ*,” *Quart. Jour. Geol. Soc.* xv. (1859), 678-680. (Read March 23, 1859.) *Sci. Mem.* ii.
- “British Fossils,” part i. “On the Anatomy and Affinities of the Genus *Pterygotus*,” *Mem. Geol. Sur. of United Kingdom*, Monograph I. (1859), 1-36. *Sci. Mem.* ii.
- “British Fossils,” part ii. “Description of the Species of *Pterygotus*,” by J. W. Salter, F.G.S., A.L.S., *Mem. Geol. Sur. of United Kingdom*, Monograph I. (1859), 37-105. *Sci. Mem.* ii.
- “On *Dasyceps Bucklandi* (*Labyrinthodon Bucklandi*, Lloyd),” *Mem. Geol. Sur. of United Kingdom* (1859), 52-56. *Sci. Mem.* ii.
- “On a Fragment of a Lower Jaw of a Large *Labyrinthodont* from Cubbington,” *Mem. Geol. Sur. of United Kingdom* (1859), 56-57. *Sci. Mem.* ii.
- “Observations on the Development of Some Parts of the Skeleton of Fishes,” *Quart. Jour. Micr. Sci.* vii. (1859), 33-46. *Sci. Mem.* ii.
- “On the Dermal Armour of *Jacare* and *Caiman*, with Notes on the Specific and Generic Characters of Recent *Crocodylia*,” *Jour. Linn. Soc.* iv. (1860), (*Zool.*), 1-28. (Read February 15, 1859.) *Sci. Mem.* ii.
- “On the Anatomy and Development of *Pyrosoma*,” *Trans. Linn. Soc.* xxiii. (1862), 193-250. (Read December 1, 1859.) *Sci. Mem.* ii.

- "On the Oceanic Hydrozoa," *Ray Soc.* (1859).
- "On Species and Races, and Their Origin" (1860), *Proc. Roy. Inst.* iii. (1858-62), 195-200; *Ann. and Mag. of Nat. Hist.* v. (1860), 344-346. *Sci. Mem.* ii.
- "On the Structure of the Mouth and Pharynx of the Scorpion," *Quart. Jour. Micr. Sci.* viii. (1860), 250-254. *Sci. Mem.* ii.
- "On the Nature of the Earliest Stages of the Development of Animals," *Proc. Roy. Inst.* iii. (1858-62), 315-317. (February 8, 1861.) *Sci. Mem.* ii.
- "On a New Species of *Macrauchenia* (*M. Boliviensis*)," *Quart. Jour. Geol. Soc.* xvii. (1861), 73-84. *Sci. Mem.* ii.
- "On *Pteraspis Dunensis* (*Archæoteuthis Dunensis*, Römer)," *Quart. Jour. Geol. Soc.* xvii. (1861), 163-166. *Sci. Mem.* ii.
- "Preliminary Essay upon the Systematic Arrangement of the Fishes of the Devonian Epoch," *Mem. Geol. Sur. of United Kingdom*, "Figures and Descriptions of British Organic Remains" (1861, Decade *x*), 41-46. *Sci. Mem.* ii.
- "*Glyptolæmus Kinnairdi*," *Mem. Geol. Sur. of United Kingdom*, "Figures and Descriptions of British and Organic Remains" (1861, Decade *x*), 41-56. *Sci. Mem.* ii.
- "*Phaneropleuron Andersoni*," *Mem. Geol. Sur. of United Kingdom*, "Figures and Descriptions of British Organic Remains" (1861, Dec. *x*), 47-49. *Sci. Mem.* ii.
- "On the Zoological Relations of Man with the Lower Animals," *Nat. Hist. Rev.* (1861), 67-84. *Sci. Mem.* ii.
- "On the Brain of *Ateles Paniscus*," *Proc. Zool. Soc.* (1861), 247-260. *Sci. Mem.* ii.
- "On Fossil Remains of Man," *Proc. Roy. Inst.* (1858-62), 420-422. (February 7, 1862.) *Sci. Mem.* ii.
- "Anniversary Address to the Geological Society, 1862," *Quart. Jour. Geol. Soc.* xviii. (1862), xl-liv. See also in list of Essays, "Geological Contemporaneity, etc." *Sci. Mem.* ii.
- "On the New Labyrinthodonts from the Edinburgh Coal-field," *Quart. Jour. Geol. Soc.* xviii. (1862), 291-296. *Sci. Mem.* ii.
- "On a Stalk-eyed Crustacean from the Carboniferous Strata near Paisley," *Quart. Jour. Geol. Soc.* xviii. (1862), 420-422. *Sci. Mem.* ii.
- "On the Premolar Teeth of *Diprotodon*, and on a New Species of that Genus (*D. Australis*)," *Quart. Jour. Geol. Soc.* xviii. (1862), 422-427. *Sci. Mem.* ii.

- “Description of a New Specimen of Glyptodon recently acquired by the Royal College of Surgeons,” *Proc. Roy. Soc.* xii. (1862-63), 316-326. *Sci. Mem.* ii.
- “Letter on the Human Remains found in Shell-mounds” (June 28, 1862), *Trans. Ethn. Soc.* ii. (1863), 265-266. *Sci. Mem.* ii.
- “Description of Anthracosaurus Russellii, a New Labyrinthodont from the Lanarkshire Coal-field,” *Quart. Jour. Geol. Soc.* xix. (1863), 56-68. *Sci. Mem.* ii.
- “On a Collection of Vertebrate Fossils from the Panchet Rocks, Ranigunj, Bengal,” *Mém. Geol. Sur. of India; Palaeontologica Indica*, ser. iv.; *Indian Pretertiary Vertebrata*, i. (1865-85).
- “Further Remarks upon the Human Remains from the Neanderthal,” *Nat. Hist. Rev.* (1864), 429-446. *Sci. Mem.* ii.
- “On the Angwantibo (*Arctocebus Calabarensis*, Gray) of Old Calabar,” *Proc. Zool. Soc.* (1864), 314-335. *Sci. Mem.* ii.
- “On the Cetacean Fossils termed ‘*Ziphius*’ by Cuvier, with a Notice of a New Species (*Belemnophius Compressus*) from the Red Crag,” *Quart. Jour. Geol. Soc.* xx. (1864), 388-396.
- “On the Structure of the Belemnitidæ,” *Mém. Geol. Sur. of United Kingdom*, Monograph II. (1864).
- “The Crocodylian Remains found in the Elgin Sandstones, with Remarks, etc.” *Mém. Geol. Sur. of United Kingdom*, Monograph III. (1877).
- “On the Osteology of the Genus *Glyptodon*” (1864), *Phil. Trans. Roy. Soc.* clv. (1865), 31-70.
- “On the Structure of the Stomach in *Desmodus Rufus*,” *Proc. Zool. Soc.* (1865), 386-390.
- “On the Methods and Results of Ethnology” (1865), *Proc. Roy. Inst.* iv. (1866), 460-463. See also *Collected Essays*, vii.
- “On Two Extreme Forms of Human Crania,” *Anthropological Review*, iv. (1866), 404-406.
- “Description of Vertebrate Remains from the Jarrow Colliery, Kilkenny, Ireland,” *Geol. Mag.* iii. (1866), 165-171.
- “On some Remains of Large Dinosaurian Reptiles from the Stormberg Mountains, South Africa,” *Phil. Mag.* xxxii. (1866), 474-475; *Quart. Jour. Geol. Soc.* xxiii. (1867), 1-6.
- “On a New Specimen of *Telerpeton Elginense*” (1866), *Quart. Jour. Geol. Soc.* xxiii. (1867), 77-84.
- “Notes on the Human Remains of Caithness” (1866), in the *Prehistoric Remains of Caithness*, by S. Laing.

- "On Two Widely Contrasted Forms of the Human Cranium," *Jour. Anat. and Phys.* i. (1867), 60-77.
- "On *Acanthopholis Horridus*, a New Reptile from the Chalk-Marl," *Geol. Mag.* iv. (1867), 65-67.
- "On the Classification of Birds; and on the Taxonomic Value of the Modifications of certain of the Cranial Bones observable in that Class," *Proc. Zool. Soc.* (1867), 415-472.
- "On the Animals which are most nearly Intermediate between Birds and Reptiles," *Ann. and Mag. of Nat. Hist.* ii. (1868), 66-75.
- "On *Saurosternon Bainii* and *Pristerodon M'Kayi*, two New Fossil Lacertilian Reptiles from South Africa," *Geol. Mag.* v. (1868), 201-205.
- "Reply to Objections on my Classification of Birds," *Ibis*, iv. (1868), 357-362.
- "On the Form of the Cranium among the Patagonians and Fuegians, with some Remarks upon American Crania in general," *Jour. Anat. and Phys.* ii. (1868), 253-271.
- "On some Organisms living at Great Depths in the North Atlantic Ocean," *Quart. Jour. Micr. Sci.* viii. (1868), 203-212.
- "Remarks upon *Archæopteryx Lithographica*," *Proc. Roy. Soc.* xvi. (1868), 243-248.
- "On the Classification and Distribution of the *Alectoromorphæ* and *Heteromorphæ*," *Proc. Zool. Soc.* (1868), 294-319.
- "On *Hyperodapedon*," *Quart. Jour. Geol. Soc.* xxv. (1869), 138-152.
- "On a New Labyrinthodont (*Pholiderpeton Scutigerum*) from Bradford," *Quart. Jour. Geol. Soc.* xxv (1869), 309-310.
- "On the Upper Jaw of *Megalosaurus*," *Quart. Jour. Geol. Soc.* xxv. (1869), 311-314.
- "Principles and Methods of Paleontology." (Written earlier as the Introduction to the Collection of Fossils at Jermyn Street.) *Smithsonian Report* (1869), 363-388.
- "On the Representatives of the *Malleus* and the *Incus* of Mammalia in the Other Vertebrata," *Proc. Zool. Soc.* (1869), 391-407.
- "Address to the Geological Society, 1869," *Quart. Jour. Geol. Soc.* xxv. (1869), 28-53.
- "Further Observations on *Hyperodapedon*," *Quart. Jour. Geol. Soc.* xliii. (1887), 675-693.
- "On the Ethnology and Archæology of India." (Opening Address of the President, March 9, 1869.) *Jour. Ethn. Soc. of London*, i. (1869), 89-93. (Delivered March 9, 1869.)

- “On the Ethnology and Archæology of North America.” (Address of the President, April 13, 1869.) *Jour. Ethn. Soc. of London*, i. (1869), 218-221.
- “On *Hypsilophodon Foxii*, a New Dinosaurian from the Wealden of the Isle of Wight” (1869), *Quart. Jour. Geol. Soc.* xxvi. (1870), 3-12.
- “Further Evidence of the Affinity between the Dinosaurian Reptiles and Birds” (1869), *Quart. Jour. Geol. Soc.* xxvi. (1870), 12-31.
- “On the Classification of the Dinosauria, with Observations on the Dinosauria of the Trias” (1869), *Quart. Jour. Geol. Soc.* xxvi. (1870), 32-50.
- “On the Geographical Distribution of the Chief Modifications of Mankind,” *Jour. Ethn. Soc. of London*, new series, ii. (1870), 404-412. (June 7, 1870.)
- “On the Ethnology of Britain,” *Jour. Ethn. Soc. of London*, ii. (1890), 382-384. (Delivered May 10, 1870.)
- “On a New Labyrinthodont from Bradford, with a Note on its Locality and Stratigraphical Position.” By Louis C. Miall. *Phil. Mag.* xxxix. (1870), 385. (*Paleontology and the Doctrine of Evolution.*)
- “Anniversary Address to Geological Society, 1870,” *Quart. Jour. Geol. Soc.* xxvi. (1870), 29-64. *Collected Essays*, viii. 340.
- “Address to the British Association at Liverpool,” *Brit. Assoc. Report*, xl. (1870), 73-89. *Collected Essays*, viii.
- “On the Milk Dentition of *Palæotherium Magnum*,” *Geol. Mag.* vii. (1870), 153-155.
- “Triassic Dinosauria,” *Nature*, i. (1870), 23-24.
- “On the Maxilla of *Megalosaurus*,” *Phil. Mag.* xxxix. (1870), 385-386.
- “On the Relations of *Penicillium*, *Torula*, and *Bacterium*,” *Quart. Jour. Micr. Sci.* x. (1870), 355-362.
- “On a Collection of Fossil Vertebrata from the Jarrow Colliery, County of Kilkenny, Ireland,” *Trans. Royal Irish Academy*, xxiv. (1871), 351-370.
- “Yeast,” *Contemporary Review*, December 1871.
- “Note on the Development of the *Columella Auris* in the Amphibia,” *Brit. Assoc. Report*, 1874 (sect.), 141-142; *Nature*, xi. (1875), 68-69.
- “On the Structure of the Skull and of the Heart of the *Megabrancheus Lateralis*,” *Proc. Zool. Soc.* (1874), 186-204.



- “On the Hypothesis that Animals are Automata, and its History,” *Nature*, x. (1874), 362-366.
- “Preliminary Note upon the Brain and Skull of *Amphioxus Lanceolatus*” (1874), *Proc. Roy. Soc.* xxiii. (1875).
- “On the Bearing of the Distribution of the *Portia Dura* upon the Morphology of the Skull” (1874), *Proc. Camb. Phil. Soc.* ii. (1876), 348-349.
- “On the Classification of the Animal Kingdom” (1874), *Journ. Linn. Soc. (Zool.)* xii. (1876), 199-226.
- “On the Recent Work of the *Challenger* Expedition, and its Bearing on Geological Problems,” *Proc. Roy. Inst.* vii. (1875), 354-357.
- “On *Stagonolepis Robertsoni*, and on the Evolution of the Crocodilia,” *Quart. Jour. Geol. Soc.* xxxi. (1875), 423-438.
- “Contributions to Morphology. Ichthyopsida.—No. 1. On *Ceradotus Forsteri*, with Observations on the Classification of Fishes,” *Proc. Zool. Soc.* (1876), 24-59.
- “On the Position of the Anterior Nasal Apertures in *Lepidosiren*,” *Proc. Zool. Soc.* (1876), 180-181.
- “On the Nature of the Cranio-Facial Apparatus of *Petromyzon*,” *Jour. Anat. and Phys.* x. (1876), 412-429.
- “On the Evidence as to the Origin of Existing Vertebrate Animals,” *Nature*, xiii. (1876), 388-389, 410-412, 429-430, 467-469, 514-516; xiv. (1876), 33-34.
- “The Border Territory between the Animal and the Vegetable Kingdoms” (1876), *Proc. Roy. Inst.* viii. (1879), 28-34.
- “On the Study of Biology,” *Nature*, xv. (1877), 219-224; *American Naturalist*, xi. (1877), 210-221.
- “On the Geological History of Birds” (March 2, 1877), *Proc. Roy. Inst.* viii. 347.
- “Address to the Anthropological Department of the British Association, Dublin, 1878. Informal Remarks on the Conclusions of Anthropology,” *Brit. Assoc. Report*, 1878, 573-578.
- “On the Classification and the Distribution of the Crayfishes,” *Proc. Zool. Soc.* (1878), 752-788.
- “On a New Arrangement for Dissecting Microscopes” (1878), *Journ. Quekett Micr. Club*, v. (1878-79), 144-145.
- “William Harvey” (1878), *Proc. Roy. Inst.* viii. (1879), 485-500.
- “On the Characters of the Pelvis in the Mammalia, and the Conclusions respecting the Origin of Mammals which may be based on them,” *Proc. Roy. Soc.* xxviii. (1879), 395-405.

- "On Certain Errors respecting the Structure of the Heart, attributed to Aristotle" (1879), *Nature*, xxi. (1880), 1-5. See also *Science and Culture*.
- "Sensation and the Unity of Structure of Sensiferous Organs" (1879), *Proc. Roy. Inst.* ix. (1882), 115-124. See also *Collected Essays*, vi.
- "On the Epipubis in the Dog and Fox," *Proc. Roy. Soc.* xxx. (1880), 162-163.
- "On the Cranial and Dental Characters of the Canidæ," *Proc. Zool. Soc.* (1880), 238-288.
- "On the Application of the Laws of Evolution to the Arrangement of the Vertebrata, and more particularly of the Mammalia," *Proc. Zool. Soc.* (1880), 649-662.
- "The Coming of Age of 'The Origin of Species'" (1880), *Proc. Roy. Inst.* ix. (1882), 361-368. See also *Collected Essays*, ii.
- "The Herring," *Nature*, xxiii. (1881), 607-613.
- "Address to the International Medical Congress, London, 1881. —The Connection of the Biological Sciences with Medicine," *Nature*, xxiv. (1881), 342-346.
- "The Rise and Progress of Paleontology," *Nature*, xxiv. (1881), 452-455.
- "A Contribution to the Pathology of the Epidemic known as the 'Salmon Disease'" (February 21, 1882), *Proc. Roy. Soc.* xxxiii. (1882), 381-389.
- "On the Respiratory Organs of Apteryx," *Proc. Zool. Soc.* (1882), 560-569.
- "On Saprolegnia in Relation to the Salmon Disease," *Quart. Jour. Micr. Sci.* xxii. (1882), 311-333.
- "Contributions to Morphology. Ichthyopsida.—No. 2. On the Oviducts of Osmerus; with Remarks on the Relations of the Teleostean with the Ganoid Fishes," *Proc. Zool. Soc.* (1883), 132-139.
- "Oysters and the Oyster Question" (1883), *Proc. Roy. Inst.* x. (1884), 336-358.
- "Preliminary Note on the Fossil Remains of a Chelonian Reptile, *Ceratochelys Sthenurus*, from Lord Howe's Island, Australia," *Proc. Roy. Soc.* xlvi. (1887), 232-238. (Read March 31, 1887.)
- "The Gentians: Notes and Queries" (April 7, 1887), *Jour. Linn. Soc. (Botany)*, xxiv. (1888), 101-124.

## APPENDIX IV \*

## HONOURS, DEGREES, SOCIETIES, ETC.

## ORDER

Norwegian Order of the North Star, 1873.

## DEGREES, ETC.

Oxford—Hon. D.C.L. 1885.

Cambridge—Hon. LL.D. 1879.

Rede Lecturer, 1883.

London—First M.B. and Gold Medal, 1845.

Examiner in Physiology and Comparative Anatomy,  
1857.

Member of Senate, 1883.

Edinburgh—Hon. LL.D. 1866.

Aberdeen—Lord Rector, 1872.

Dublin—Hon. LL.D. 1878.

Breslau—Hon. Ph.D. and M.A. 1861.

Würzburg—Hon. M.D. 1882.

Bologna—Hon. M.D. 1888.

Erlangen—Hon. M.D. 1893.

## SOCIETIES—LONDON

Royal, 1851; Sec. 1872-81; Pres. 1883-85; Royal Society's  
Medal, 1852; Copley Medal, 1888; Darwin Medal, 1894.

Linnean, 1858; Linnean Medal, 1890.

Geological, 1856; Sec. 1859-62; Pres. 1869-70; Wollaston Medal,  
1876.

Zoological, 1856.

Odontological, 1863.

Ethnological, 1863; Pres. 1868-70.

Anthropological Institute, 1870.

Medico-Chirurgical, Hon. Memb. 1868.

Medical, Hon. Memb. 1873.

Literary, 1883.

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\* This list has been compiled from such diplomas and letters as I found in my father's possession.

Pharmaceutical, Silver Medal for Botany, 1842.  
 Royal College of Surgeons, Member, 1862; Fellow, 1883; Hunterian Professor, 1863-69.  
 St. Thomas's Hospital, Lecturer in Comparative Anatomy, 1854.  
 British Association for the Advancement of Science, Pres. 1870; Pres. of Section D, 1866.  
 Royal Institution, Fullerian Lecturer, 1863-67.  
 British Museum, Trustee, 1888.

#### SOCIETIES—PROVINCIAL, COLONIAL AND INDIAN

Dublin University Zoological and Botanical Association; Corr. Member, 1859.  
 Liverpool Literary and Philosophic Society, Hon. Memb. 1870.  
 Manchester Literary and Philosophical Society, Hon. Memb. 1872.  
 Odontological Society of Great Britain, 1862.  
 Royal Irish Academy, Hon. Memb. 1874.  
 Historical Society of Lancashire and Cheshire, Hon. Memb. 1875.  
 Royal Society of Edinburgh, British Hon. Fellow, 1876.  
 Glasgow Philosophical Society, Hon. Memb. 1876.  
 Literary and Antiquarian Society of Perth, Hon. Memb. 1876.  
 Cambridge Philosophical Society, Hon. Memb. 1871.  
 Hertfordshire Natural History Society, Hon. Memb. 1883.  
 Royal College of Surgeons of Ireland, Hon. Memb. 1886.  
 New Zealand Institute, Hon. Memb. 1872.  
 Royal Society of New South Wales, Hon. Memb. 1879, Clarke Medal, 1880.

#### FOREIGN SOCIETIES

International Congress of Anthropology and Prehistoric Archaeology, Corr. Memb. 1867.  
 International Geological Congress (Pres.) 1888.

#### *America*

Academy of the Natural Sciences of Philadelphia, Corr. Memb. 1859.  
 Odontographic Society of Pennsylvania, Hon. Memb. 1865.  
 American Philosophical Society of Philadelphia, 1869.  
 Buffalo Society of Natural Sciences, Hon. Memb. 1873.  
 New York Academy of Sciences, Hon. Memb. 1876.

- Boston Society of Natural History, Hon. Memb. 1877.  
 National Academy of Sciences of the U.S.A., Foreign Associate,  
 1883.  
 American Academy of Arts and Sciences, Foreign Hon. Memb.  
 1883.

*Austria-Hungary*

- Königliche Kaiserliche Geologische Reichsanstalt (Vienna),  
 Corr. Memb. 1860.  
 K. K. Zoologische-botanische Gesellschaft in Wien, 1865.

*Belgium*

- Académie Royale de Médecine de Belgique, 1874.  
 Société Géologique de Belgique, Hon. Memb. 1877.  
 Société d'Anthropologie de Bruxelles, Hon. Memb. 1884.

*Brazil*

- Gabineta Portuguez de Leitura em Pernambuco, Corr. Memb.  
 1879.

*Denmark*

- Royal Society of Copenhagen, Fellow, 1876.

*Egypt*

- Institut Egyptien (Alexandria), Hon. Memb. 1861.

*France*

- Société Impériale des Sciences Naturelles de Cherbourg, Corr.  
 Memb. 1867.  
 Institut de France; "Correspondant" in the section of Physi-  
 ology (succeeding von Baer), 1879.

*Germany*

- Microscopical Society of Giessen, Hon. Memb. 1857.  
 Imperialis Academia Caesariana Naturae Curiosorum (Dres-  
 den), 1857.  
 Imperial Literary and Scientific Academy of Germany, 1858.  
 Royal Society of Sciences in Göttingen, Corr. Memb. 1862.  
 Royal Bavarian Academy of Literature and Science (Munich),  
 For. Memb. 1863.

- Royal Prussian Academy of Sciences (Berlin), 1865.  
 Medicinisch-naturwissenschaftliche Gesellschaft zu Jena, For.  
 Hon. Memb. 1868.  
 Geographical Society of Berlin, For. Memb. 1869.  
 Deutscher Fischerei-Verein, Corr. Memb. 1870.  
 Berliner Gesellschaft für Anthropologie, Ethnologie, und Urge-  
 schichte, Corr. Memb. 1871.  
 Naturforschende Gesellschaft zu Halle, 1879.  
 Senkenbergische Naturforschende Gesellschaft (Frankfurt  
 am M.) Corr. Memb. 1892.

#### *Holland*

- Dutch Society of Sciences (Haarlem), For. Memb. 1877.  
 Koninklyke Natuurkundige Vereeniging in Nederlandisch-Indie  
 (Batavia), Corr. Memb. 1880.  
 Royal Academy of Sciences (Amsterdam), For. Memb. 1892.

#### *Italy*

- Società Italiana di Anthropologia e di Etnologia, Hon. Memb.  
 1872.  
 Accademia de' Lincei di Roma, For. Memb. (supplementary),  
 1878, ordinary, 1883.  
 Reale Accademia Valdarnense del Poggio (Florence), Corr.  
 Memb. 1883.  
 Società dei Naturalisti in Modena, Hon. Memb. 1886.  
 Società Italiana delle Scienze (Naples), For. Memb. 1892.  
 Accademia Scientiarum Instituti Bononiensis (Bologna), Corr.  
 Memb. 1893.

#### *Portugal*

- Accademia Real das Sciencias de Lisboa, For. Corr. Memb. 1874.

#### *Russia*

- Imperial Academy of Sciences (St. Petersburg), Corr. Memb.  
 1865.  
 Societas Caesarea Naturae Curiosorum (Moscow), ordinary  
 member, 1870, Hon. Memb. 1887.

#### *Sweden*

- Societas Medicorum Svecana, Ordinary Memb. 1866.

## ROYAL COMMISSIONS

T. H. Huxley served on the following Royal or other Commissions :—

1. Royal Commission on the Operation of Acts relating to Trawling for Herrings on the Coast of Scotland, 1862.
2. Royal Commission to inquire into the Sea Fisheries of the United Kingdom, 1864-65.
3. Commission on the Royal College of Science for Ireland, 1866.
4. Commission on Science and Art Instruction in Ireland, 1868.
5. Royal Commission upon the Administration and Operation of the Contagious Diseases Acts, 1870-71.
6. Royal Commission on Scientific Instruction and the Advancement of Science, 1870-75.
7. Royal Commission on the Practice of subjecting Live Animals to Experiments for Scientific Purposes, 1876.
8. Royal Commission to inquire into the Universities of Scotland, 1876-78.
9. Royal Commission on the Medical Acts, 1881-82.
10. Royal Commission on Trawl, Net, and Beam Trawl Fishing, 1884.





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