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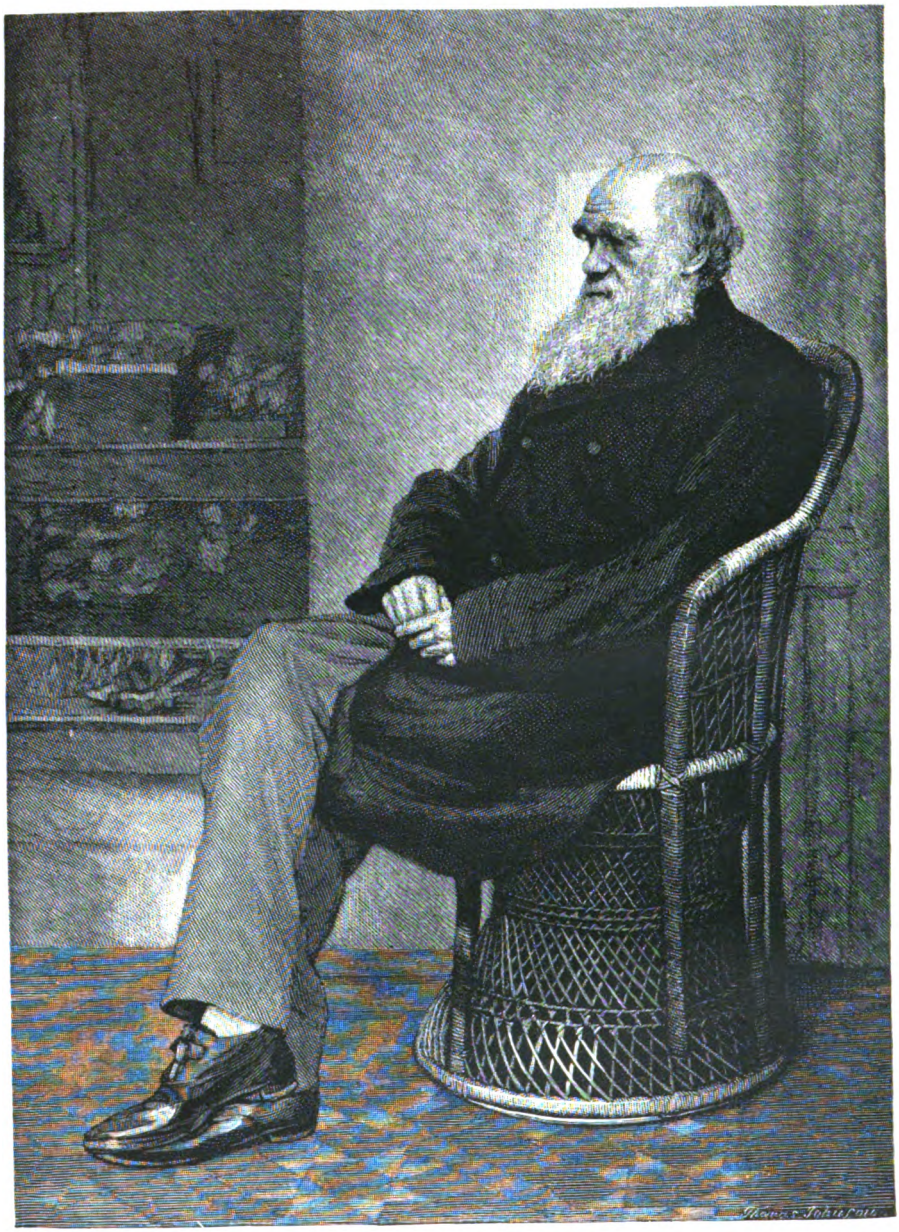

CHARLES ROBERT DARWIN.

(From a photograph by Capt. L. Darwin, R.E.)

A SCIENTIFIC CENTENARY.

ON Thursday, the 24th of May, the centenary anniversary of the Linnæan Society was held at Burlington House, when a large number of distinguished naturalists assembled. On February 26th, 1788, James Edward Smith, Goodenough, afterwards Bishop of Carlisle, Thomas Marsham, Dr. Jonas Dryander, J. T. Swainson, Beckwith, and James Dickson, met at a coffee house in Great Marlborough Street and founded the Linnean Society. To Smith, who was afterwards knighted, the Society owes a vast debt, for it was he who acquired the famous collections of the great Swedish naturalist. The chair at the centenary meeting was occupied by Mr. Carruthers, the president, and he proposed the election of the King of Sweden and Norway as an honorary Fellow, remarking that his Majesty took a great interest in science, and that this was a specially suitable occasion on which to make the election. The motion was unanimously agreed to, and Mr. Ole Theodor Olsen, as a Swedish subject, undertook to say for the King that had he been in England he would have been present, and that nothing gave him greater pleasure than to work for the welfare of science.—The treasurer (Mr. Frank Crisp) said, during the century the Society had received in revenue about £104,000, and had spent the money in carrying on the work of the Society, or had invested it in the Society's interest, as much as £38,000 having been invested in books. —Mr. B. Daydon Jackson, botanical secretary, then gave some account of the Society's origin and of the history of its collections; and the president delivered an address, in which he referred in feeling terms to the great and exceptional losses which the Society had sustained during the past year by death.—A vote of thanks having been passed for this address, on the proposition of Sir John Lubbock, four eulogia were pronounced.—Professor Thöre Fries, occupant of the chair of botany at Upsala, communicated a paper on his illustrious predecessor, which was read by the chairman. It brought out the fact that the wonderful naturalist, when only twenty-two years of age, divined his principle of classification, which ruled the world for generations, and that he, unlike many of his disciples, saw its arbitrary character, and awaited the discovery of a natural system. The paper also spoke of the profound sleep of natural science during the Middle Ages, and the hard struggle which had to be fought before men of science could liberate themselves from a narrow orthodoxy, or the fetters they had themselves forged by attaching infallibility to Aristotle and classic authors. Linnæus bore an honourable part in placing the study of natural science on a logical basis by his clear definitions and admirable nomenclature, and by the enthusiasm he was able to rouse in his disciples for the same methods. England, unluckily for Sweden, became his heir: many, consequently, were the ties which united the memory of Linnæus with this country, the strongest perhaps being the Linnæan spirit, the genuine spirit of freshness and enterprise in which scientific research is carried on in England.—Sir Joseph Hooker read a tribute to the labours and sagacious judgment of Robert Brown, who collected nearly 4,000 species of Australian plants, the greater part of these being new to science.—Professor Flower pronounced the eulogy on Charles Darwin, who he said, had special claims on their consideration, inasmuch as a large and very important portion of his work was first communicated to the world by means of papers read at their meetings and published in their journal. The great characteristic of Darwin which dominated all others, and made him what he was, was the consuming, irrepressible longing to unravel the mysteries of living nature, to penetrate the shroud which conceals the causes and methods of all the wonders and all the diversity, all the beauty, yea, and all the deformity too, which we saw around us in the life of animals and plants. Against our ignorance on those subjects his life was one long battle; the work of others, by comparison, was irregular guerilla warfare. His main victory was the destruction of the conception of species as being beyond

certain narrow limits fixed and unchangeable—a conviction which prevailed almost universally before his time. It might be admitted that others had prepared the way, and that the work was carried on simultaneously by men who might have attained to the same conclusion; but the fact remained that he was the main agent in the conversion of almost the whole scientific world from one conception to a totally opposite conception of one of the most important operations of nature. Such a revolution, with its momentous consequences to the study of zoology and botany, was without a parallel in the history of science. Darwin's work and the controversies that had gathered round it had proved a marvellous stimulus to research. Though he did not, as it had been too rashly said, tear down the curtain which obscured our gaze and lay bare the birth of life, he had lifted the veil here and there and given us glimpses which would light the path of those who followed in his steps; and, more than this, he showed by his life and by his work the true methods by which alone the secrets of nature may be won. —Mr. W. T. Thiselton Dyer delivered a eulogy on George Bentham. A nephew of Jeremy Bentham, he was early imbued with a taste for methodising and analysing, and through his mother's fondness for plants and the attraction which their classification had for him he was led to study them with marvellous results. He was president of the Linnæan Society from 1863 to 1874, and his devotion to its interests knew no bounds.—Then followed the presentation of Linnæan Gold Medals to Sir R. Owen a as zoologist and Sir J. Hooker as a botanist. The medal had on one side a portrait of Linnæus, and on the reverse the arms of the Society surrounded by the *Linnæa borealis*. Addressing Sir Richard Owen, K.C.B., the president observed that he could not place the medal in his hands without referring to the distinguished services he had rendered to biological science by philosophical grasp of the subject, by his interpretation of the vertebrate skeleton and its appendages, and the marvellous exposition and restoration of fragments of animals preserved in the rocks, by which he had repeopled ancient continents with their extinct inhabitants built up from their skeletons. In 1839, when a fossil bone was sent to Sir Richard from New Zealand, he constructed from it the idea of a huge bird larger than the ostrich, which had formerly inhabited the island, and subsequent evidence confirmed the scientific speculation in its entirety. The venerable anatomist, who is now in his eighty-fourth year, was much affected, as were most of those present, and in a few broken sentences expressed his deep sense of the honour which the Society had done him. In addressing Sir Joseph Hooker, K.C.S.I., the President referred to his "Himalayan Journals," "Flora of British India," and the "Genera Plantarum," in addition to a large number of memoirs by which botanists for all time were placed under obligation to his genius and labours. Sir Joseph, in acknowledging the honour, observed that his family had now been for three generations associated with the Society.—In the evening the annual dinner was held at Hôtel Victoria.

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"THERE is a book, inscribed by hand divine,
By man named Nature—Scriptures old and new;
Open it lies to all, but ah! how few
Can of its revelations read a line!
Its gospel unto most is but a mine
Of labyrinthine lore without a clue—
Hieroglyphs, palimpsests abstrusely true,
Needing a sage's genius to define.
Such sage was Darwin. Modes of life to scan
He loved, and of their variance sought the norm;
In 'fitness' he discerned the mould of form,
In 'evolution' traced creation's plan.
He linked the lives of zoophyte and man,
And coupled earth's mutations with the worm."

CHARLES DARWIN.

HE unobtrusiveness of Darwin's life and the far-reaching importance of his life-work furnish a chapter unparalleled in modern times. On the roll of "Nature's Famous Disciples" his name stands forth as the most illustrious. What he little thought of, and still less desired, has come to pass—he occupies the most conspicuous pinnacle of the Temple of Fame. When at Cambridge, one of his friends told him he would some day be a Fellow of the Royal Society; but, says he in his Autobiographical Reminiscences, "the notion seemed to me preposterous." Late in life, he owned that the favourable reviews of his books, and their large sale, gratified him, but he declared that he never turned an inch out of his course to gain fame, regarding the good opinion of his nearest personal friends, such as Lyell and Hooker, far above that of the general public. His life speaks for itself, and tells us how little he cared for fame. Yet his fame is before that of all others.

This record of his life, however, is not placed here merely because his name has become famous. The goddess Fame, whom he so little worshipped, must not be adored by those who should follow and adore his example. The value of his life to us lies in the exemplary modesty of the man, and his persevering efforts to decipher, in the face of the sneers of an unsympathetic world, some of the intricate secrets of Nature.

Charles Robert Darwin was born at Shrewsbury on the 12th of February, 1809. His father was Robert Waring Darwin, F.R.S., a physician; and his mother was a daughter of Josiah

Wedgwood. His father's father was Erasmus Darwin, F.R.S., "poet and philosopher," the author of "The Botanic Garden," "Zoonomia," etc.

At eight years of age he was sent to a school kept by a Unitarian minister. One of his schoolfellows at this school remembers his bringing a flower to school and saying that his mother had taught him *how to discover the name of a plant by looking at the inside of the blossom.* Before he had been here long his mother died, and shortly afterwards he was sent to the Grammar School, where Dr. Butter was head master. From here, in 1825, he went to Edinburgh, where his brother was a medical student, in order that he, too, might enter the profession.

Neither at school nor college did he particularly distinguish himself in scholarship: in fact, he always considered that he owed but little to the tuition he there received. The scholastic methods of the time were ill suited to his type of mind. He admired the clear geometrical proofs of Euclid, and would have made progress in Algebra if the significance of some of the earlier processes had been pointed out by his tutors. He was zealous in what interested him, but verse-making in Latin and Greek he could not accomplish, although he derived pleasure from Horace.

He read White's "Selborne," and the "Wonders of the World," took long solitary walks, collected minerals, birds' eggs, beetles, etc., and was fond of angling and shooting. Shakespeare, Thomson's "Seasons," Scott, Byron, were read for hours, the reader sitting in an old window in the thick walls of the Grammar School. At the age of thirteen there was awakened in him, during a tour on the borders of Wales, a vivid delight in natural scenery. The enthusiastic way in which in after years he spoke and wrote of the forest scenery of America is very impressive.

In his Autobiography he says, with respect to his love for scientific pursuits while at school, "I must have observed insects with some little care, for when, at the age of ten years, I went for three weeks to Plas Edwards, on the seacoast in Wales, I was very much interested and surprised at seeing a large black and scarlet Hemipterous insect, many moths (Zygæna), and a Cicindela, which are not found in Shropshire." The instruction and example of his sisters, he says, made him humane as a boy; he did not think it right to kill insects for the sake of making a collection. When angling he never spitted a living worm; and from seeing a bird which had been wounded but not killed by a shot from a gun on the previous day, he determined to give up what was to him a delightful sport. Frequently his strong humanity became manifest in after life.

Darwin was deeply mortified during his school-days by his father telling him he would be a disgrace to himself and his family, as he "cared for nothing but shooting, dogs, and rat-catching." But, he says, "my father, who was the kindest man I ever knew, and whose memory I love with all my heart, must have been angry and somewhat unjust when he used the words."

During the interval between attending the Grammar School and going to Edinburgh, he visited several of his father's patients in Shrewsbury; and, he says, "my father, who was the best judge of character whom I ever knew, declared that I should make a successful physician."

At Edinburgh he found the lectures, with the exception of those on chemistry, intolerably dull. But he found congenial friends, with whom he hunted the tidal pools for zoological specimens. He even made the interesting discovery that the so-called ova of Flustra had the power of independent movement by means of cilia, and were in fact larvæ. He read a paper on the subject to the Plinian Society at Edinburgh, as well as another in which he showed that the little globular bodies which had been supposed to be the young state of *Fucus loreus* were the egg-cases of the worm-like *Pontobdella muricata.*

He also made the acquaintance of a negro who had accompanied Waterton in some of his "Wanderings," and who was skilful as a bird-stuffer. Of this man he took lessons, for payment.

The geological lectures he heard made him half determine never to read another geological book.

As it became evident to his father that he did not like the thought of becoming a physician,

he abandoned the idea of making him one. The cases in the clinical hospital distressed him greatly. Vivid pictures of some of them remained in his memory many years. So a new line was struck. It was proposed he should become a clergyman. "I asked," he says, "for some time to consider, as from what little I had heard or thought of the subject, I had scruples about declaring my belief in all the dogmas of the Church of England; though otherwise I liked the thought of being a country clergyman. Accordingly I read with care 'Pearson on the Creed,' and a few other books on divinity; and as I did not then in the least doubt the strict and literal truth of every word in the Bible, I soon persuaded myself that our Creed must be fully accepted. Considering how fiercely I have been attacked by the orthodox, it seems ludicrous that I once intended to be a clergyman."

As it was necessary for him to take a degree, he now went to Cambridge, where he met Professor Henslow, between whom and himself a firm friendship was soon cemented. He considered his intimacy with Henslow, "whose benevolence was unbounded," an inestimable benefit. As an example of Henslow's kind consideration, Darwin relates the following incident: "Whilst examining some pollen grains on a damp surface, I saw the tubes exserted, and instantly rushed off to communicate my surprising discovery to him." Now, I do not suppose that any professor could have helped laughing at my coming in such a hurry to make a communication. But he agreed how interesting the phenomenon was, and explained its meaning, but made me clearly understand how well it was known; so I left him not in the least mortified, but well pleased at having discovered for myself so remarkable a fact, but determined never to be in such a hurry again to communicate my discoveries."

Amongst others with whom he became intimate at Cambridge was Sedgwick, who completely restored to its right place in his estimation the subject of geology. His reading of Humboldt's "Personal Narrative" filled him with an intense longing to see Teneriffe, and he made inquiries about ships which could convey him thither. His wish, however, was destined to receive a larger fulfilment than he expected, for he received through Henslow an offer from Captain Fitzroy to accompany him in an expedition round the world. Henslow himself, it is believed, had the offer first, and would have been glad to accept it, for Mrs. Henslow gave her consent generously, but "looked so miserable that he at once settled the point."

At first Dr. Darwin was strongly averse from his son's going with the expedition, but said he would give his consent if Charles could find one man of common sense who would advise him to go. Fortunately Darwin's uncle, Mr. Wedgwood, thought well of the proposal, and, although Darwin had written to decline the offer, persuaded his father to give his consent. It appeared afterwards, however, that Fitzroy had very nearly rejected Henslow's recommendation, *on account of the shape of Darwin's nose!*

In December 1831 the *Beagle*, after much delay, left England for the voyage of circumnavigation of the globe, which was to prove, through Darwin, pregnant with mighty results. Fond of natural history, even anxious to add to its stores of knowledge a few facts, Darwin had, however, as yet never dreamed of the theory which has explained and been explained by such a multitude of facts and observations. He had read his grandfather's "Zoonomia," and at Edinburgh had heard of Lamarck's views of evolution, but without any marked effect on his mind. We cannot read his "Naturalist's Journal," however, without recognising here and there the dawn in his thoughts of the new ideas. That journal, the story of the voyage of the *Beagle*, has proved to many lovers of natural history by far the most captivating book ever written for them. It is, indeed, to naturalists, what Spenser's "Faerie Queen" is to poets. Its author said that Belt's "Naturalist in Nicaragua" was "the best of all natural history journals which have ever been published," and perhaps it is, with the exception of the "Voyage of the *Beagle*."

In that voyage Darwin had a somewhat singular-minded man as commander, but he made certain stipulations beforehand, with the object of making the voyage a really useful one from a scientific point of view; and, moreover, he found amongst the officers congenial fellow-travellers. Cramped for room, and constantly

suffering from sea-sickness, especially whenever the weather was bad, he yet worked hard upon the voyage.

The expedition had for its primary object the surveying of the shores of Chili, Peru, and some islands in the Pacific, and to carry a chain of chronometrical measurements round the world. But Darwin accompanied the *Beagle* strictly in the capacity of naturalist. He was much ashore at different points, and whether ashore or afloat, his great genius for observation detected the salient features, geological, zoological, and botanical, of the parts visited; while at the same time his great genius for theorising suggested lines of reasoning the soundness of which was demonstrated during many subsequent years of careful and patient experiment. In the "Naturalist's Journal" the reader again and again catches glimpses of what must have been the first suggestions to Darwin's own mind of the doctrine he was destined to establish, but the far-reaching effect of which he did not at the time realise.

When at Ascension, on the passage homewards, Darwin heard from his sister that Sedgwick had stated that he had earned a place amongst the leading scientific men. The fact was that Henslow had read to the Cambridge Philosophical Society some of the letters which Darwin had sent him, and had had some of them printed for circulation, while the collection of fossil bones which he had sent to Henslow also created much interest amongst Palæontologists.

The voyage lasted from December 27th, 1831, to October 2nd, 1836. "Giddy with joy and confusion," he wrote to Henslow immediately upon his arrival at Shrewsbury, telling him he was "in the clouds, and neither knew what to do nor where to go," his chief puzzle being about his geological specimens. Then followed two years and three months of the greatest activity of his life—the time intervening between the voyage and his marriage. Even now, however, the delicate state of health which lasted the remainder of his life began to tell upon his powers. At first he settled in lodgings in Cambridge, where all his collections were, and commenced to abstract for publication from his carefully written MS. journal the more interesting scientific results of the voyage. At Lyell's request he also wrote for the Geological Society an account of his observations of the elevation of the coast of Chili.

In March 1837 he took lodgings in Great Marlborough Street, London, where he stayed until he was married, two years afterwards. Here he finished his journal, wrote several papers for the Geological Society, commenced the preparation of the MS. of his "Geological Observations," and got ready for publication his "Zoology of the Voyage of the *Beagle*."

In July 1837 he opened his first note-book for facts in relation to the Origin of Species—"about which I had long reflected, and never ceased working for the next twenty years. . . . During the voyage of the *Beagle* I had been deeply interested by discovering in the Pampean formation great fossil animals covered with armour like that on the existing armadillos; secondly, by the manner in which closely allied animals replace one another in proceeding southwards over the Continent; and thirdly by the South American character of most of the productions of the Galapagos archipelago, and more especially by the manner in which they differ slightly on each island of the group; none of the islands appearing to be very ancient in a geological sense. It was evident that such facts as these, as well as many others, could only be explained on the supposition that species gradually become modified. . . . I worked on true Baconian principles, and, without any theory, collected facts on a wholesale scale." Fifteen months after his systematic work on the subject began, he read Malthus, and found in the universal fact of a struggle for existence a clue. This he followed up, but determined not to write even a brief sketch of his theory for some time to come. It was in 1842 that he wrote the first account of it, in pencil, extending to 35 pages. In 1844 he enlarged it to 230 pages. In 1856 Lyell pressed him to write out his views more fully, and he began the task upon a scale three or four times as great as that on which the "Origin" was ultimately published. Yet the

work on the large scale was only an abstract from his collected materials.

Between 1844 and 1856 occurred to him the importance of a problem he had hitherto overlooked—the tendency of organic beings descended from the same stock to diverge in character as they become modified. "I can remember the very spot in the road, whilst in my carriage, when to my joy the solution occurred to me; and this was long after I had come to Down. The solution, as I believe, is that the modified offspring of all dominant and increasing forms tend to become adapted to many and highly diversified places in the economy of nature."

In 1858 Wallace sent home from the Malay Archipelago his essay on "The Tendency of Varieties to depart indefinitely from the Original Type." This he sent to Darwin, and Darwin found Wallace had struck exactly the same theory as his own. At the urgent request of Lyell and Hooper he now consented to a publication of his views; and Wallace's communication and one from himself were read together before the Linnean Society. The next year the "Origin" appeared, and was greeted with a chorus of savage howling which has become historic. It reached the ears of the hard-working, patient, confirmed invalid at Down, but without ruffling his temper in the slightest degree. He had, in fact, no temper to be ruffled: satisfied with the results of his long investigation, indifferent about the good or bad opinion of the general public, generous towards those who differed from him, confident of the ultimate success of truth, he persevered steadily with the studies he had on hand, and volume after volume of his epoch-making works came from the press. Wilberforce, Bishop of Oxford, was one of the most hostile and insolent of opponents to Darwin's views. But neither his speeches at the British Association meeting at Oxford nor his review in the *Quarterly* annoyed Darwin, who wrote to Hooker: "I have just read the *Quarterly*. It is uncommonly clever; it picks out with skill all the most conjectural parts, and brings forward well all the difficulties"; and to the Vicar of Down he wrote, "If you have not seen the last *Quarterly*, do get it: the Bishop of Oxford has made such capital fun of me and my grandfather."

It would be well if all the bitter controversy that ensued upon the publication of the "Origin," and was partially renewed upon the issue of the "Descent of Man," could be forgotten, save that its intensity brings out in bold relief the meek forbearance and generosity of the man whose truthseekings had given rise to it. Upon his decease the *Observer* remarked, "Though he knew it not, the moral lesson of his life is perhaps even more valuable than the grand discovery which he has stamped on the world's history." It would be difficult to say whether naturalists value Darwin's discoveries more than they love and revere the man for the bright example he has left us all.

In 1881 the world was surprised by the publication of Darwin's "Formation of Vegetable Mould through the Action of Worms." But the subject was not a new one to Darwin; the book gave the results of forty years of observation. Forty years before, he had read a communication on the subject to the Geological Society. It was a striking characteristic of Darwin's work that it was unhasting; this was seldom borne in mind, if it were ever known, by the class who so clamorously opposed his teachings.

We must, however, return to the lodgings in Great Marlborough Street, where Darwin remained until his marriage, in January 1839, when he removed to Upper Gower Street. The residence at Down was taken up in 1842, and here for forty years he led a very retired life, prosecuting the various inquiries into the workings of nature, of which he gives us in his different books such admirable explanations. During his residence in London, before his marriage, he was strong enough to go into general society; but afterwards, and during the whole of his subsequent life, it was only by carefully fostering his strength that he was able to spend a brief period each day in his investigations. The sacredness of his retired life was not unfrequently rudely broken in upon by correspondents who sent impertinent letters. Whenever any request for information was received which bore the mark of honesty of purpose, no matter from what humble source the inquiry may have come, Darwin made it a matter of conscience to reply, and confessed

that it robbed him of sleep at night if he thought he had neglected a correspondent.

The difficulties under which his splendid life-work was achieved will perhaps be understood from the passage with which his son Francis closes his chapter of "Reminiscences" of his father in his "Life and Letters of Charles Darwin" (Murray, 3 vols., 1888) :—

"If the character of my father's working life is to be understood, the conditions of ill-health under which he worked must be constantly borne in mind. He bore his illness with such uncomplaining patience, that even his children can hardly, I believe, realise the extent of his habitual suffering. In their case the difficulty is heightened by the fact that, from the days of their earliest recollections, they saw him in constant ill-health, —and saw him, in spite of it, full of pleasure in what pleased them. Thus, in later life, their perception of what he endured had to be disentangled from the impression produced in childhood by constant genial kindness under conditions of unrecognised difficulty. No one, indeed, except my mother, knows the full amount of suffering he endured, or the full amount of his wonderful patience. For all the latter years of his life she never left him for a night; and her days were so planned that all his resting hours might be shared with her. She shielded him from every avoidable annoyance, and omitted nothing that might save him trouble, or prevent him becoming overtired, or that might alleviate the many discomforts of his ill-health. I hesitate to speak thus freely of a thing so sacred as the lifelong devotion which prompted all this constant and tender care. But it is, I repeat, a principal feature of his life, that for nearly forty years he never knew one day of the health of ordinary men, and that thus his life was one long struggle against the weariness and strain of sickness. And this cannot be told without speaking of the one condition which enabled him to bear the strain and fight out the struggle to the end."

On the 19th of April, 1882, he died. During the previous night he had a severe attack of pain at his heart, and fainted. He was brought back to consciousness with great difficulty, and seeming to recognise the approach of death, said "I am not the least afraid to die." In 1879 he had written in his "Autobiography," "As for myself, I believe that I have acted rightly in steadily following and devoting my life to Science. I feel no remorse from having committed any great sin, but have often and often regretted that I have not done more direct good to my fellow-creatures."

Darwin's Study at Down.