

LIFE OF SIR CHARLES LYELL.*

Lyell was the Darwin of geology. The principle of "uniformitarianism" which he expounded and advocated in the first edition of his classical "Principles of Geology" in 1830, and the development of which was the central idea of his life, has probably done as much for progress in geology as have the doctrines expounded in Mr. Darwin's "Origin of Species" and "Descent of Man" for progress in biological science. These two thick volumes of Letters and Journals, however, show that Lyell, while first of all a geologist, was at the same time something more. His life, like that of most workers in science and literature, was outwardly unmarked by any exciting incidents, and, therefore, its best record is to be found in his letters and journals and published works, exhibiting, as they do, with great fullness, the development of his mind and doctrines. Lyell, fortunately, was a voluminous letter-writer, and his "journals" are really long letters to his wife written during his occasional absences from her. The selection has, on the whole, been made with great judgment, and, by means of occasional brief prefatory paragraphs and footnotes, all the information is given which is needed to render the allusions in the correspondence intelligible. Fortunately, Sir Charles himself largely filled up the gap between his birth and the beginning of the correspondence by an autobiographical sketch, written, before his marriage, to his future wife, the eldest daughter of Leonard Horner, to whom he was married in 1832. Lyell was the eldest child of the laird of Kinnordy, a small estate in Forfarshire; the father himself having made some reputation as a botanist and an expounder of Dante. Though born in Scotland, Lyell left it when only a few months old, and spent his boyhood and youth at Bartley, near Stony Cross, in the New Forest, of which his father had taken a lease; so that, although by birth a Scotchman, his upbringing was essentially English. He was educated at private schools at Ringwood and Salisbury, and latterly at a semi-public school, a sort of offshoot of Winchester, at Midhurst, in Sussex. Here the life was essentially that of a public school, and Lyell's account of his struggles is extremely interesting. From the first he shrank from anything like aggression, and his conduct at Midhurst was a type of his bearing throughout his life. Here, as at most schools, a boy had to fight his way to the place he was to occupy in the estimation of his fellows, and Lyell avoided as long as possible coming to open action, having meantime to submit to many indignities and misconceptions. In the end, however, he felt himself compelled, in order to render his life at all tolerable, to come to blows with a bully, and his description of the two days' fight is graphic and amusing. The autobiography ends abruptly in his second year at Midhurst, leaving a gap of about three years before he entered Exeter College, Oxford. Still, we are told enough to have an idea of the kind of training he had in his early years. The course was the ordinary course of public schools of the time, in which science had no place. There was a good deal of fighting, gambling (mainly for the boys' breakfast bread), amateur flute-playing, birdnesting, &c., in all which, except the fighting, Lyell took an active part. Long before this, when about ten years old, he had learnt to take an interest in entomology, during a lengthened absence from school, when he was free to roam through the vistas and among the ponds of the New Forest. Very curiously, in his early years he manifested great want of attention and aversion to work. Before he went to Oxford at the age of 17 he had his first taste of his favourite science in Bakewell's "Geology," which he found in his father's library—a taste intensified and probably confirmed by Buckland's lectures at Oxford. Lyell took a respectable, but not a brilliant place at college, though he seems to have worked diligently, occasionally diverging into verse, for which he showed a taste from early years. Both in the choice of subject and metre he manifested some originality in this respect—a proof, he believed, of his possessing more "invention" than the average of boys. He took his B.A. in 1819, and M.A. two years later.

The letters begin in 1816, and, at greater or less intervals, are continued down to the last year of his life. At the age of 20 his geological bent had evidently been well developed, as then we find him geologizing with enthusiasm at Yarmouth with Lawson Turner, and in the same year (1817) he visits Staffa, and makes some verses on the cave, of fair quality, and showing at least the possession of the scientific imagination. In 1818 he visited France and Switzerland, geologizing all along his route, and making the acquaintance of many eminent men of science. By 1822 he had taken up with the active business of his life, that of a working geologist; for, though he entered Lincoln's Inn and was called to the Bar, his practice was confined to two years on the Western Circuit. Between 1822 and 1828 he did much geologizing in the Isle of Wight, the neighbouring mainland, the south-west of England, Scotland (with Buckland), and the Paris basin. In Paris he saw a good deal of Humboldt, Cuvier, and others eminent both in science and in the exciting politics of the time. Already his correspondence was extensive, and his publications included various papers to scientific societies, and a remarkable article on Scrope's "Geology of Central France," in the *Quarterly Review* for 1827. Here he seems first to have distinctly formulated the principle which was to guide his geological investigations throughout life; he maintained that all geological phenomena "were to be interpreted by reference to aqueous and igneous causes in action in the ordinary course of nature." Though a Liberal in every sense of the term, he had a good deal to do with the *Quarterly* and with Lockhart and the set of which the latter was the centre, including Scott, of whom he gives some pleasant sketches of personal gossip. At this early period he had developed those advanced ideas on education and on Universities which he matured and published after his first visit to America. In 1827, also, the reading of Lamarck (who "delighted him more than any novel he ever read") planted in his mind certain conceptions as to the origin of species and the descent of man, which in future years, partly under the more powerful influence of Mr. Darwin's investigations, ripened into the doctrines so ably expounded in "The Antiquity of Man." By this time, however, the preparations for the great work of Lyell's life, his "Principles of Geology," were well advanced; but before completing and publishing it he decided to make a tour in Auvergne with Murchison to institute a thorough examination of the remarkable extinct volcanoes of that region. This he did in 1828, and was absent for a year; for, after leaving Auvergne, and Murchison and his wife, he went slowly down through Italy to Naples and Sicily, where he made an almost exhaustive examination of the geological phenomena of that region. Lyell and the "Leicestershire foxhunter," as he called Murchison, got on admirably, in spite of the latter's occasional dilatoriness and love of "drugs." This latter weakness on the part of Murchison Lyell makes much fun of, and, indeed, he gives us a good deal of insight into the private character of the greatest social lion of science of his time.

This long excursion in France and Italy had a marked influence on the development of the great principle which permeates Lyell's "Principles of Geology," the first volume of which was published in 1830, about a year after his return. The principle of the uniformity of the action of nature throughout all time, although it may be said to have originated with Hutton and Playfair, was really definitely shaped and developed by Lyell, and the credit of it, as a fruitful principle in science, is as clearly due to him as that of evolution is to Mr. Darwin, notwithstanding the previous conceptions of Erasmus Darwin, Lamarck, and others. But it was not only this principle which his great work brought before the thinking world in 1830, but also some of those other questions which have ever since divided the adherents of the old and the new, the Liberals and Conservatives of thought. It was due, probably, to the characteristic moderation and tolerance and the aversion to aggressiveness which were such prominent features in Lyell's character that the excitement raised by the publication of the "Principles" never rose to an actual storm. He was clear enough in stating his own opinions, but he shrank as sensitively from saying anything that would irritate an opponent as he would from a breach of good manners or from intolerance in religion. Probably, also, the admirable preparatory article in the *Quarterly* by Scrope had something to do with the comparatively favourable reception of the

work. On the subject of the article there is a long and interesting correspondence between Lyell and Scrope, which, perhaps, more than anything will give the reader an insight into the judicious moderation of Lyell's character. He had an absolute dread of giving offence to those who feared the influence of scientific progress upon religion. That the work did give offence in some quarters, both among the religious and the scientific, was inevitable; but how really little alarm was created in the Church is shown by the fact that the chair of Geology in King's College, London, was offered to Lyell shortly after, the requisition being signed by an archbishop and other Church dignitaries. There were, of course, long and keen discussions in the Geological Society and elsewhere between the Utilitarians (of whom Buckland was the type and leader) and the "Pluvialists," as Murchison, Lyell, and their followers were dubbed. The former, in their extremity, were compelled to invent no end of "floods" to account for the phenomena which came crowding in upon them from geological research; but their complicated and unnatural system vanished as inevitably before the light of uniformitarianism, as did the astronomy of Ptolemy before that of Copernicus. We have said that Lyell was the Darwin of geology, and in the feature above referred to, as well as in other respects, the points of resemblance in the mental characteristics of the two men (without reference to calibre) are very striking.

Lyell accepted the chair of geology, but held it only for two years. Indeed, he shrank from holding office of any kind, desirous of devoting all his time to the development of his favourite science. Still, he could not escape, and was President more than once of the Geological Society and once of the British Association. He very firmly declined being put in nomination for the representation of London University, and the first letter to Mr. Darwin in these volumes, in 1836, just after the young naturalist had returned from his famous voyage in the Beagle, contains strong counsel on the advisability of a real worker in science avoiding, as far as possible, all official posts. This advice, as every one knows, Mr. Darwin has followed almost to the letter. In this respect Lyell was a great contrast to his friend Murchison, who, as the former remarks, looked mainly to the rewards of science—the social rewards, no doubt—in which Murchison revelled.

Lyell may be said to have henceforth lived for the improvement of his "Principles of Geology," round which centred all his scientific life and work. Few purely scientific works have run through so many editions (eleven) in so short a time. Each edition was a distinct advance on the previous one, and each marks a stage in the progress of geology. It is the great English text-book of the science, and, if kept up to date, it may long continue to be so, notwithstanding the vast developments the science has taken through the cosmological investigations of recent years. We need only allude to the epitome of the "Principles" which forms his "Elements of Geology" and to his great work on the "Antiquity of Man." This last is a subject on which there is much correspondence in these volumes between Lyell and Mr. Darwin, Mr. A. R. Wallace, and others. Lyell never seems to have gone quite so far as Mr. Darwin in this direction, nor does he seem to have followed the latter along with Huxley, Hocker, and others in their extreme opinions on the origin of species. The great bulk of the letters in these volumes are of interest to inquiring students of science, exhibiting as they do the opinions of the writer in the actual process of formation. While, to the very last, absolutely open to receive fresh light and frankly to modify his opinions accordingly, Lyell was never in haste to do so; in some cases he did so with reluctance, and in opposition to strong sentiment on the other side. So suspicious was he of his conclusions that, when in Auvergne, he tells us, that what he looked for was not proofs, but disproof of the doctrine he was developing. Lyell was all his life a great traveller, his visits to the Continent, from Sweden to Sicily, were incessant, and he was three or four times in America.

We must admit that much in these two volumes will be interesting and even intelligible only to those who have some acquaintance with the science of which they are so full. No matter to whom Lyell was writing, whether it was to Mr. Darwin or to his little nephew of six years old, and no matter what might be the subject of the letter, it always diverged into geology or some kindred subject. Still, there is also much in the letters of the widest interest. Lyell was not a brilliant writer, either of letters or books, but he is never uninteresting. Many of the letters, however, written about the time of the first publication of the "Principles," when even the moderate-minded Lyell was all aglow with enthusiasm, are almost eloquent in the force of their language. But the interest throughout depends entirely on the matter. On every subject of interest throughout the whole course of his long life does Lyell touch more or less, always with the same genuine liberality but judicial moderation of opinion which characterizes his scientific writing. Though a man of essentially unruffled temperament, he had immense social capacities, was quietly, but deeply attached to relatives and friends, and though with, perhaps, no positive humour, greatly enjoyed all genuine fun. His correspondents, friends, and acquaintances comprised almost every one of note at home and abroad, including the Queen and her Consort. On his several visits to America he made many friends, and to Ticknor and others he wrote numerous long letters discussing not only science, but many other things closely connected with the progress and welfare of the United States. His volumes on America are even yet worth reading. Lyell was a man of exceptional shrewdness in judging of character and ability, and of the ultimate and probable issue of social movements. Some of his prophecies made with reference to the future career of men now eminent, but at the time totally unknown, are quite striking; with regard to two eminent living geologists they have been almost literally fulfilled. Many little pictures of social life in the cultured circles of past times do we get in these letters, with scraps of talk and the good things that were said by Rogers, Sydney Smith, Walter Scott, Macaulay, Mrs. Somerville, and others. The glimpses Lyell's letters give us into the Court life at Balmoral and Osborne, where he was not an infrequent guest, are especially attractive. What he tells of his experience of Prince Albert only serves to confirm the high opinion already formed of the Prince, and to prove what an almost irreparable loss his death was to the nation as well as to the Royal Family. Lyell's account of the long talk he had with the Queen at Osborne some years after the Prince's death, in which, among other things, he explained at her request the principles of Darwinism, is almost worthy of a picture: the Royal children, too, working with spade and hoe, and being rigidly paid by their father with day labourer's wages, that they might get an insight into the condition of the class. His knighthood in 1848, like his subsequent baronetcy, was expressly given for his service to science, and was, therefore, naturally gratifying.

We wish we had space to give a few extracts from these letters depicting the social and scientific life of the 60 years over which they extend—Huxley's famous passage with the Bishop of Oxford at the Oxford meeting of the British Association in 1860, "Young Buckland's" (the late Frank's) presentation of the bear dressed as a Don to his father's Oxford guests, the conversations at Balmoral and Oxford, the shrewd remarks on "Young Manning," the then unknown Froude, the Tractarians generally, education and lay teachers, Sir Robert Peel, whose character is perfectly sketched, slavery, the Reform Bill, "the steam coach" in Regent's Park, Wheatstone's telegraph, and a hundred other topics. The letters are, indeed, a valuable addition to the social history of the period; but above all they show to us the formation and development of a mind which, while almost absolutely non-aggressive, was, if not of the most powerful, yet of solid calibre and judicial balance, and which, combined with the shrewdest insight and an almost perfectly trained observation, exercised a substantial influence on scientific progress and scientific as well as popular opinion. Withal Lyell was a man of the gentlest nature and of such wide, if not intense, sympathies as to make him tolerant and cautious almost to a fault. It is fortunate that he has left such ample material in these letters and journals for the crowded, though unexciting story of his life, that little of formal biography is necessary. The weakest feature in these volumes is the index, which ought to have been very much fuller, and in another edition should be greatly improved. The two portraits of Lyell, that of his wife, and the view of Kinnordy are well done and welcome.

* "Life, Letters, and Journals of Sir Charles Lyell, Bart." Edited by his sister-in-law, Mrs. Lyell. Two vols. Portraits. London: Murray, 1881.