

Obituary.

CHARLES ROBERT DARWIN.

THE cable announces the death of CHARLES ROBERT DARWIN, the celebrated naturalist and scientist. It occurred at Down House, his picturesque residence near Orpington, in Kent. He had been ill for some days, but was supposed to be recovering. On Tuesday, however, he suffered a relapse, and never rallied. The high priest of modern biological science was in his own person one of the best possible illustrations of the laws of heredity. Both his paternal and maternal grandfathers were men of great distinction in science about the close of the eighteenth century, and their names would still be secure from oblivion if the illustrious discoverer of the laws of organic life had never lived. Other members of his immediate family, to the number of at least ten, achieved more or less distinction in science, as evidenced by the fact of their election to the Royal Society or to other associations to which admission is only conceded on the score of good scientific work.

Charles Robert Darwin was born at Shrewsbury, Feb. 12, 1809. In that thriving provincial capital by the River Severn, near the Welsh frontier, celebrated for the defeat and death of Hotspur (1403), he passed an uneventful childhood, receiving a classical training at the once famous Shrewsbury Grammar School, then under the headmastership of Rev. Dr. Samuel Butler, afterward Bishop of Lichfield and Coventry. Shrewsbury was then the residence of quite a number of persons of education and refinement, and there Dr. Butler's "Modern and Ancient Geography for the Use of Schools" was printed in 1813,—a work which maintained its place as a standard text-book until quite recent times. It is very probable that young Darwin derived in great measure his early passion for travel from the influence of Dr. Butler. Be this as it may, he must have been a precocious student, for he was able to enter the University of Edinburgh in 1825, when only sixteen years old. Why the capital of North Britain was thus honored cannot now be ascertained, but Darwin remained there only two years. In 1827 he entered Christ's College, Cambridge, apparently as a Freshman, since he did not graduate B. A. until four

years later. Of the university career of Darwin, either at Edinburgh or Cambridge, we have as yet few particulars beyond the fact that at Cambridge he gave especial attention to botany under the influence of the late Rev. Professor John Stevens Henslow, author of the excellent "Principles of Descriptive and Physiological Botany" (1835) in Lardner's "Cabinet Cyclopædia." It is known, however, that at Edinburgh he had devoted some attention to marine zoology, and had read his first scientific paper, "On the Movement of the Ova of Flustra," before the Plinian Society.

VOYAGE OF THE BEAGLE.

In October, 1830, His Majesty's ships, the Adventure and Beagle, cast anchor in Plymouth Sound, returning from a four years' survey for purposes of navigation of the coasts of Patagonia and Terra del Fuego. The expedition had been commanded by Captain Philip Parker King, but its chief honors were carried off by a young officer of the Beagle, Captain Robert Fitzroy (1805-65), son of General Lord Fitzroy, who had, in December, 1828, been assigned by Rear Admiral Otway, commanding the Brazilian station, to fill the post vacated by the death of Captain Pringle Stokes, the original commander of the Beagle. In gratitude to his patron, Captain Fitzroy had given the name of "Otway Water" to a large inland sea, fifty miles long, which he had discovered within the Straits of Magellan, and which was connected by the "Fitzroy Channel" with another large salt-water lake. The records of this exploration created a favorable impression at the Admiralty, and Captain Fitzroy found no difficulty in securing orders to return in the Beagle to South America, and after completing the charts of the coasts of Chili and Peru, to return homeward by the East Indies. It was a happy thought of Captain Fitzroy to publicly offer to give up part of his own cabin to any competent naturalist who would accompany the expedition. The offer caught the eye of young Darwin, who at once offered his services without salary, on condition of retaining the disposal of his scientific collections. Darwin was then in an extremely early stage of his evolution as a naturalist; but Captain Fitzroy did not dream of applying any process of "natural selection" in the choice of a companion, and, with the support of Professor Henslow, the stripling of twenty-two years obtained what would now be considered a prize by any naturalist of double his age. The expedition, "well manned, well appointed, and well provided," set sail from Plymouth November 27, 1831, and cast anchor at Falmouth on its return, October 2, 1836, having been absent four years and ten

months, and having accomplished its objects far better than any one then dreamed.

RESULTS OF THE CRUISE.

During those five years Mr. Darwin saw Brazil, Patagonia, Chili, Peru, the Galápagos and Society Islands, New Zealand, Australia, the Mauritius, St. Helena, and the Cape Verde Islands, and from every spot visited carried away some scientific trophy destined to figure in the history of the "doctrine of development." Nothing came amiss to this wonderful observer. His original specialty was supposed to be botany, but his observations on physical geography, geology, and zoology were quite as accurate and valuable as his botanical researches. The full results of this memorable voyage came slowly to light. Captains King and Fitzroy had the *pas* over the young naturalist in the race for glory, and besides, they had to bring up the geographical arrears of that earlier "Voyage of the Beagle," performed when Darwin was still at the universities. Their *opus magnum*, "A Narrative of the Surveying Voyages of His Majesty's ships, Adventure and Beagle, between the years 1826 and 1836," describing their "Examination of the Southern Shores of South America and the Beagle's Circumnavigation of the Globe" (2 vols., 1839) might have been accepted as a sufficiently full account of an average exploring expedition; but it was thrown into the shade by a less pretentious volume which appeared later in the same year, "A Journal of Researches into the Geology and Natural History of the Various Countries Visited by His Majesty's ship Beagle, under the command of Captain Fitzroy, from 1832 to 1836," by "Charles Darwin, Esq., M. A., F. R. S., Secretary to the Geological Society." These honorary titles indicate the immediate results to Mr. Darwin of his first contributions to the great scientific societies of the British metropolis. His work above named originally appeared as the third volume of the official narrative; but it soon achieved its independence and autonomy, being published separately in 1845, and more than once reprinted since. It is without doubt "one of the most fascinating records of travels to be read in English, for in it we see the young observer's mind intent upon the unfolding mystery, the already opening secret of natural selection." The President of the Geological Society was not wrong in his conclusion: "Looking at the general mass of Mr. Darwin's results, I cannot help considering his voyage around the world as one of the most important events for geology which has occurred for many years."

GEOLOGY AND ZOOLOGY.

His health was much shattered when he landed in England, and his scientific labors were for years after considerably interrupted. In 1839 he married his cousin, Emma Wedgwood, a granddaughter of Josiah Wedgwood, and after his marriage he went to reside at Down, amid the rich and picturesque scenery of Kent, and as his numerous family grew up he was relieved by them of all the cares of active life likely to distract the scientific worker. He next turned his attention to geology, in which science he undoubtedly ranks among the foremost, and his writings on that subject have contributed immensely to the knowledge of hitherto obscure branches. He wrote three separate volumes, — “The Structure and Distribution of Coral Reefs,” 1842; “Geological Observations on Volcanic Islands,” 1844, and “Geological Observations on South America,” 1846. His greatest work on zoology is probably his “Monograph of the Family Cirripedia,” a family which includes all the animals commonly known as barnacles and sea-acorns. He gave an accurate definition of every known species, and so admirable was the style, so accurate his perception, that it was pronounced to be one of the most remarkable books of the century. This work was published by the Ray Society in 1851–53. It was speedily followed by another able commentary, on “The Fossil Species,” which was brought out by the Palæontographical Society.

ORIGIN OF SPECIES.

His grandfather, Dr. Erasmus Darwin, published in 1794 speculative views containing at least the germ of the Darwinism of to-day, and in 1858 Charles Darwin proposed the hypothesis of the origin of species by spontaneous variation, and the survival of the fittest through natural selection and the struggle for existence, in his “Origin of Species.” This wonderful book was translated into a number of foreign languages, and was the subject of more reviews and critical pamphlets than any other work of the age. The doctrine he propounded may be briefly summarized as follows: All organic beings are liable to vary in some degree, and tend to transmit such variations to their offspring. All at the same time tend to increase at a very rapid rate, and their increase is kept in check by the incessant competition of other individuals of the same species or by physical conditions injurious to each organism or to its power of leaving healthy offspring. Whatever variation occurring among the individuals of any species of animals or

plants is in any way advantageous in the struggle for existence, will give to those individuals an advantage over their fellows which will be inherited by their offspring, until the modified variety supplants the parent species. This process, termed natural selection, is incessantly at work, and all organized beings are undergoing its operations. By the steady accumulation during long ages of time of slight differences, each in some way beneficial to the individual, arise the various modifications of structure by which the countless forms of animal and vegetable life are distinguished from each other. All existing animals have descended from at most only four or five progenitors, and plants from an equal or lesser number. Analogy would even lead to the inference that all the organic beings which have ever lived on this earth have descended from some primordial form into which life was first breathed. It cannot be questioned that this volume worked as complete a revolution in biological science as the "Principia" did in astronomy. Helmholtz, the great German philosopher, who was much impressed by it, declared that it contained an essentially new creative thought. It was received at first with attacks characterized chiefly by insolence and ignorance. As time wore on, however, a change came over the critics, and there grew a tendency to review the gigantic ideas formulated in the book with a spirit of calm deliberation. Many distinguished Christian thinkers accepted the idea of the creation as given in the Bible and also that of evolution, although Professor Huxley in an able review demonstrated the logical impossibility of the acceptance of the two theories. His doctrines excited controversies which are not yet at an end, and many eminent scientists and naturalists have embraced the principles embodied in his teachings, and great changes have been consequently induced in the methods of biology and kindred sciences. In other works he pursued the same line of thought, but the book which may be taken as a continuation in point of deduction of his "Origin of Species" is the "Descent of Man and Selection in Relation to Sex," which was published first in 1871, and of which a second edition, with numerous additions, appeared in 1874. In this work the author astonished the world by his declaration that man is probably descended "from a hairy quadruped with a tail and pointed ears, probably arboreal in its habits." His doctrine of the descent of species by natural selection has been denounced in Germany as partaking of the vices of a spurious and teleological natural philosophy. There also his speculations as carried out by himself in his "Descent of Man" have powerfully influenced the whole of recent anthropological theorizing, for the German thinkers and writers who still hold to

the doctrine of the fixity of species are the exception and not the rule. The question of the origin of language, which is most important to a right understanding of the relation of man's mental nature to that of the lower animals, has been dealt with by Mr. Darwin, and his influence on German authors has been very marked. Among the famous thinkers of that country who have applied his method of evolution to the explanation of language are A. Schleicher, L. Geiger, Dr. G. Jäger, Wilhelm Bleek, and Ernst Hæckel.

EVOLUTION OF MIND.

He wrote with marked ability on the evolution of mind and consciousness, and possibly reached partial success in framing a conceivable hypothesis for the transition from the rudimentary mental faculties of brutes to those fully developed in the human mind. Huxley, however, differed with the naturalist, and declared that between the mind of the highest anthropoid ape and that of man there is an enormous gap and a distance practically infinite. However, in his "Expression of the Emotions in Men and Animals" (1873) there is food for thought, and many scientists and thinkers of repute both in this country and in Europe have followed the lead of Darwin in preference to that of Huxley. The mind of man in its lowest stages of development is here brought into close juxtaposition to the animal mind, and the upward progress of man is viewed as affected by natural causes, chief among which is the action of natural selection. Mr. Darwin does not inquire into the exact way in which the mental and the bodily are connected. He simply assumes that, just as the bodily organism is capable of varying in an indefinite number of ways, so may the mental faculties vary indefinitely in correspondence with certain physical changes. In this way he seeks to account for all the higher mental powers, as the use of language and reason, the sentiment of beauty and conscience. A catalogue of the literature of Darwinism lately published in Berlin, gives thirty-six octavo pages of the titles of works, and the names of three hundred and twelve authors; so some idea may be formed of the revolution in thought the learned naturalist brought about.

In 1853 the Royal Society awarded him their gold medal for his various scientific works, and in 1859 the Geological Society honored him with their Wollaston Palladian medal. He was created a knight of the Order pour le Mérite by the Prussian Government. In June, 1871, he was elected a Corresponding Member of the Academy of

Vienna. Honorary degrees were conferred upon him in 1875 by the University of Leyden, in 1877 by Cambridge University, and in 1878 the membership of the French Academy was accorded him. His declining years were marked by unceasing industry, and the following works were the last that issued from his pen: "Insectivorous Plants," 1875; "Cross- and Self-Fertilization in the Vegetable Kingdom," 1876; "The Different Forms of Flowers in Plants of the same Species," 1877; "The Power of Movement in Plants," 1881, and "Vegetable Mould and Earthworms," 1882. When young he pursued field-sports with the combined interest of the hunter and the naturalist. During the whole of his life he was in easy circumstances, and above the toil of earning an income. Thus fortunately situated, unlike most philosophers, he was enabled to devote his entire time to his favorite pursuits.

Professor Huxley, in 1880, lecturing on the "Coming of Age of the Origin of Species," pointed out the ridicule with which the work was at first received. He told also how powerful had been the influence of the book, and with these words concluded a most instructive discourse: "Thus, when on the 1st day of October next the 'Origin of Species' comes of age, the promise of its youth will be amply fulfilled, and we shall be prepared to congratulate the venerated author of the book, not only that the greatness of his achievement and enduring influence upon the progress of knowledge have won him a place beside our Harvey, but still more, that, like Harvey, he has lived long enough to outlast detraction and opposition, and to see the stone that the builders rejected become the head-stone of the corner." With this fit and appropriate tribute from a fellow-scientist and friend, this brief sketch of his life of industry and devotion to nature closes.