DEATH OF CHAS. DARWIN

THE LIFE AND WORK OF THE EMINENT NATURALIST.

HIS ANCESTRY AND EDUCATION—EARLIEST SCIENTIFIC WORK—HIS PUBLICATIONS—THE THEORY OF EVOLUTION AND THE USE HE MADE OF IT.

The announcement that Charles Robert Darwin died on Wednesday at his residence, Down House, near Orpington, will be read by very few individuals who have not some degree of acquaintance with the physical theories formulated and taught by this distinguished naturalist, however scanty may be their actual knowledge of his works. Darwin has been read much, but talked about more. Since the publication of his work "On the Origin of Species" in 1859, and particularly within the 11 years which have elapsed since his "Descent of Man" was given to the world, he has been the most widely known of living thinkers. Doctrines such as he set forth could not long remain the exclusive property of philosophers nor of educated people. They made their way at once into the reading and thought of the masses until the slightest allusion to Darwinism was sure of instant recognition from even the most illiterate individual or audience. It is not to be supposed that every country clergyman, with a library not extending far beyond Richard Baxter, Jortin, Bishop Berkeley, and a commentary or two, became profoundly versed in the doctrines of evolution, or that little laughing schoolgirls joking each other about a monkey ancestry had followed Mr. Darwin very far in his speculations on differentiation of species, but the ministers somehow all knew that evolution was an abominable heresy to be by precept and example thrust out of men's minds, and the school children intuitively understood that if man is descended from the ape he cannot be descended from Adam. All that part of the world which had never thought of such things before was aroused by the shock of a new idea. Previous speculations upon the origin of man had, it is safe to say, been the diversion of the learned; the people at large had no part in them. But here was a scientist, not a speculative philosopher, who dealt with facts and logical inferences in a new way, and he speedily had the whole world for an audience. Everybody saw that the history of living forms as his books taught it was widely at variance with the Mosaic account of the creation, and from the moment when the Darwinian theory of evolution was publicly stated the modern struggle between science and theological dogma took its rise. There had been skeptics and atheists and deists and what not before, but what grave essayists call scientific unbelief sprang primarily from works of Charles Darwin, and is fed chiefly from the writings of other scientists who are at work extending and completing the frame work he erected. Mr. Darwin, therefore, may be called a epoch-making man.

The qualities and natural bent of his clear mind were inherited. His father and grandfather were naturalists, though the latter, Dr. Erasmus Darwin, was a much more famous and productive man than his son, Dr. R. W. Darwin. Erasmus Darwin, a botanist of renown, is best known as the author of a remarkable poem called the "Botanic Garden," which, though destitute of the poetic feeling, shows its author to have been deeply versed in the Linnæan system of botany. Of Dr. R. W. Darwin little is known save that he was a member of the Royal Society. Charles Robert Darwin was born at Shrewsbury, England, Feb. 12, 1809. His early education was received in the Shrewsbury Grammar School, under the tuition of Dr. Butler. In 1825, when he was 16 years old, he entered Edinburgh University, and remained there two years, going then to Christ's College, Cambridge, where he received the degree of Bachelor of Arts in 1831. In December of the same year he was selected as a naturalist to make a voyage of scientific exploration around the world on board the ship Beagle. Five years were spent in this way. We may fairly suppose that Mr. Darwin was a naturalist of some competence and training when he set out on this voyage. The opportunities for research, experiment, and study which it gave him, particularly during his stay in South America, were fruitful in the material and hints out of which his later theories were evolved. Indeed, in geographical and geological distribution Mr. Darwin found the weightiest proofs of the truth of his system. Returning from this voyage in 1836, he began the preparation of a "Journal of Researches" into the geology and natural history of the countries visited by the expedition. This was published as a part of Capt. Fitzray's "Narrative of the Surveying Voyages of H. M. S. Beagle and Adventurer." In succeeding years he edited, in five parts, the "Zoology of the Voyage of the Beagle," the notes of the habits and range of mammalia being by his hand. Out of the material obtained on this cruise he prepared for publication in 1842 "The Structure and Distribution of Coral Reefs;" in 1874, "Geological Observations on Volcanic Islands," and in 1846, "Geological Observations on South America." Between 1844 and 1859 his publications were mostly brief monographs contributed to scientific publications or read before learned societies. But during this long period of slight literary productivity he occupied himself with untiring zeal and systematic regularity in the study of nature, making a series of observations upon the forms and habits of animals, plants, and minerals—for it is hard to say whether he was most eminent in zoology, botany, or geology—and slowly accumulating that vast mass of facts and registered phenomena to which he was later on to apply his theory of evolution.

The publication in 1859 of his work "On the Origin of Species by Means of Natural Selection; or, the Preservation of Favored Races in the Struggle for Life," was the announcement to his friends that he had at length passed over the sea of hypothesis to the firm ground of scientific assertion, and to the world that it must revise or fortify its opinions on biological subjects. After making in 1862 one of those excursions into the by-ways of scientific inquiry of which he was so fond, of which the outcome was his work on "The Various Contrivances by which Orchids are Fertilized by Insects," and still another in 1865 to publish the well-known book on "The Movements and Habits of Climbing Plants," he put forth in 1868 another important work on "The Variation of Animals and Plants Under Domestication," in two volumes. In 1871 appeared the best known of all his books, "The Descent of Man, and Selection in Relation to Sex," in two volumes. The following year saw the publication of "The Expression of the Emotions in Man and Animals;" in 1875 appeared "Insectiverous Plants;" in 1876, "The Effects of Cross and Self-fertilization in the Vegetable Kingdom;" in 1877, "The Different Forms of Flowers and Plants of the Same Species," and in 1881 "The Power of Movement in Plants." Each of these books has its place in the development of the theory which bears their author's name. All of them, even those which concern only a single order of the phenomena, abound in illustrations pertinent to his great theme, and supply those who wish to use or investigate his theories with the classified results of his accurate observations. But it is upon the "Origin of Species" and the "Descent of Man," in which the theory of evolution is made to tell the history of life upon the earth as we now see it, that his fame chiefly rests.

If asked to define Darwinism, the orthodox antagonist of the scientific unbelief of the day will reply that it is an attempt to show how blind matter became the seeing eye; the biologist of the Haeckel school will say that it is a description of the mechanical process by which the cosmic system was produced out of elementary matter acted upon by its own laws. Neither definition is correct, for Mr. Darwin made an extremely modest use of his great attainments. He did not construct a theory of the cosmos, and he did not deal with the entire theory of evolution. He was content to leave others to poke about in the original protoplasmic mire, and to extend the evolutionary law to social and political phenomena. For himself, he tried to show how higher organic forms were evolved out of lower. He starts with life already existing, and traces it through its successive forms up to the highest—man. The central principle—his opponents call it a dogma—of Mr. Darwin's system is "natural selection," called by Herbert Spencer "the survival of the fittest," a choice which results inevitably from "the struggle for existence." It is a law and fact in nature that there shall be the weak and the strong. The strong shall triumph and the weak shall go to the wall. The law, though involving destruction, is really preservative. If all plants and animals were free to reproduce their kind under like and equally favorable conditions, if all were equally strong and well equipped for obtaining sustenance and making their way in the world, there would soon be no room on the earth for even a single species. Thirty millions of men in less than 700 years of unchecked reproduction, under the conditions we have mentioned, would have living offspring enough to cover the whole earth at the rate of one for each square foot of its surface. The limit of subsistence and the power of reproduction are the bounds between which the conflict rages. In this struggle the multitudes are slain and the few survive. But the survivors do not owe their good luck to chance. Their adaptation to their surroundings is the secret of their exemption from the fate which overtakes those less happily circumstanced. A variety of squirrels, for instance, which is capable of wandering far afield in pursuit of its food, which is cunning and swift enough to evade its enemies, and has a habit of providing a store of nuts for Winter use, will naturally have a better chance of survival than a variety deficient in these qualities. But Mr. Darwin also discovered that natural selection created special fitness for given circumstances and surroundings. Climate, soil, food supply, and other conditions act in this way, and the result is the differentiation of species. A certain thistle grows in a kind of soil which is rich in the elements which go to produce the tiny hairs upon the surface of the plant. The seeds are thus furnished with downy wings longer than usual, and are wafted further off where they have plenty of space to grow, and they, in turn, reproduce and emphasize the changes to which they owe their existence. Seeds or nuts developing a thick covering for the kernel are thus protected from birds and animals, and live to germinate, producing also hard-shelled seeds, and thus the process goes on. Varieties which do not develop a high degree of special adaptation to their surroundings fall out of the race, unable to defend themselves against their innumerable aggressors. An infinitesimally minute variation of function or structure repeated and becoming more marked through many successive generations, results ultimately in the production of a variety, or even of a species, quite unlike the parent individual.

Mr. Darwin was by no means the discoverer of the theory of evolution. That is at least as old as Aristotle, who supposed individuals to be produced, not by a simultaneous creation of a minute copy of the adult, with all the different organs, but by epigenisis—that is, by successive acts of generation or growth, in which the rudiment or cell received additions. Other ancient philosophers, and in more modern times Descartes, Spinoza, Leibnitz, Bonnet, Lamarck, and Cuvier, have adopted and used this theory to a greater or less extent. But it never had a substantial basis of fact or a thoroughly scientific application until Mr. Darwin worked it out. Others, as we have said, and notably Mr. Spencer, have given it a more comprehensive scope, but within the limits he set for himself Mr. Darwin meets no rival claimant for the honors the scientific and thinking would have accorded him. The dispatch announcing his death says that he had been suffering for some time from weakness of the heart, but continued to work to the last. He was taken ill on Tuesday night with pains in the chest, faintness, and nausea. The nausea lasted more or less during Wednesday and culminated in death in the afternoon. Mr. Darwin remained fully conscious until within a quarter of an hour of his death.