THE CENTENARY OF CHARLES DARWIN.[1]

By Henry Kraemer.

It is not my purpose to take the time of the meeting by attempting to give a résumé of the work of Charles Darwin or an estimate of the influence and character of this savant of the nineteenth century, the centenary of whose birth is being celebrated throughout the civilized world at this time.[2] I think, however, that it is but fitting for a professor of natural science of this college to place on record a minute that we, in this centenary year, paused along with other scientists, and paid our tribute of praise and gratitude to this liberator of thought.

Darwin was the author of something over twenty books and nearly one hundred papers, about one-third of his writings being on botanical subjects. It was his book, "The Origin of Species by Means of Natural Selection," published on November 24, 1859, which was his epoch-making work, freeing us, as it did, from the shackles of the past, or, in other words, freeing us from the necessity of considering the supernatural in our study of the biological sciences. While this is true, it is probably safe to say that apart from his masterful deductions his other most enduring contribution to science lies in the impetus given to scientific research by his comprehensiveness of vision, his ability to study natural phenomena at first hand, to discriminate between facts and opinions, and finally to connect facts in an orderly sequence. In short, it is the Darwinian method which has proved to be such a boon in scientific research.

Darwin furnished a conspicuous example of the law of heredity for which he claimed so much. His grandfather on his paternal side was Dr. Erasmus Darwin, a poet and philosopher, his name being often coupled with that of Lamarck, as an early evolutionist; and on his mother's side his grandfather was Josiah Wedgwood, the inventor of wedgwood-ware, formerly used much in making mortars for the use of apothecaries. His father, Robert Waring Darwin, F.R.S., was an eminent physician, and it was his desire that Charles should likewise study medicine. Accordingly, in 1825, he was sent to Edinburgh, where, he says, he found the lectures on geology and

[1] Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, held February 16, 1909.

[2] Charles (Robert) Darwin was born February 12, 1809, at Shrewsbury (England).

zoology incredibly dull, although he was at that time engaged in collecting and studying mineral and zoological specimens, and although he afterwards attained such eminence in each of these sciences. Darwin's father, learning that he did not like the study of medicine, decided that he should fit himself to be a clergyman, and thus after two years at Edinburgh he was sent to Christ's College, Cambridge. Here he attracted the attention of Professor Henslow, the mineralogist and botanist, who became his "dearest friend," directed him in his natural history studies, and aroused in him that enthusiasm which characterized the remainder of his career as a scientist.

Through the reading of Humboldt's "Personal Narrative" Darwin acquired a desire to travel, and this opportunity soon offered itself. Professor Henslow not only used his influence in securing for him the privilege of going on the voyage of H. M. S. *Beagle* as naturalist under Captain Fitz-Roy on a surveying tour round the world, but strongly advised him to do so. The voyage lasted from December 27, 1831, to October 2, 1836, nearly five years, and it was on this trip that Darwin collected so much of the material that formed the basis of his future work in geology, zoology, and botany. He described carefully his observations each day in his famous Journal of the Voyage, and altogether it is no wonder that Darwin looked upon this voyage as the most important event in his life and as one that determined his whole career.

Then, for more than twenty years he experimented, and pondered on his observations and those of others, before giving his final conclusion to the world. This was his theory of natural selection as a factor in organic evolution, and his discussion of this subject was set forth, as already pointed out, in his "Origin of Species." Darwin takes as his starting point the fact that in the lives of organic beings there is a struggle for existence, and that those which survive in this struggle are those possessing some favorable qualities. These qualities arise or originate as slight variations or modifications, which are transmitted through inheritance, and preserved and accumulated through natural selection. That is, favorable variations give the organism an advantage, and it survives and they are preserved or perpetuated. Thus, through gradual modification in the course of time new varieties and species come to be recognized

Darwin felt that if natural selection was one of the factors in evolution, light would be thrown on the subject by careful studies

on plants and animals under domestication, and his observations, together with those of others on the marked improvement brought about by man's selection, confirmed him in this view. To this topic alone he devoted two volumes under the title "Variation of Animals and Plants Under Domestication."

In enunciating his doctrine of natural selection, or the Survival of the Fittest, as Herbert Spencer termed it, Darwin was strongly assailed on all sides, even by naturalists and scientists themselves, as up until that time the majority of naturalists believed that species were fixed and distinct creations, not even Lyell or Hooker having previously considered that species were mutable. Fortunately, he was supported by Alfred Russell Wallace who had simultaneously arrived at the same conclusion, Huxley, Asa Gray, Hooker, Spencer, and others. To-day we have neo-Darwinians, Lamarckians, neo-Lamarckians, mutationists, Weismannians and Mendelians, and so on,—all battering away at Darwin's doctrines of heredity and evolution, but these doctrines bid fair to stand for an indefinite period.

It is not too much to say that Darwin's work has formed the basis of a newer geology, botany and zoology. His book on the "Descent of Man" has been the basis in the development of anthropology; while his book on "The Expression of the Emotions in Man and Animals" has made a rational psychology possible, and the celebrated geologist, Geikie, said, "No man of his time exercised upon the science of geology a profounder influence than Charles Darwin."

Darwin touched life at every point. Like Aristotle, he believed that the essence of a living thing is not what it is made of, nor what it does, but why it does it. His love of science was great, as he twice states in his Autobiography. In addition to this, his ambition was to be esteemed by fellow naturalists like Lyell and Hooker, caring nothing for public applause, although pleased if his works were understood or appreciated. Twenty per cent. of his life was made up of years of illness, and he conserved his time so that no moment was wasted. Poulton has recently suggested that it was largely because of the relatively few hours a day that he could work, he gave up his interest in poetry, music and art in later life.

He attached relatively little importance to priority of discovery, and said of some of his fundamental discoveries which had given him great satisfaction, and which were subsequently worked out more fully, that if he failed to impress his readers he who succeeds in

doing so deserves all the credit. His generous treatment of the writings and observations of others, whether published or simply in letters, was proverbial. It is true, he made some mistakes, which he apparently knew better than others, and in a letter to Huxley on one occasion, said, "I have sometimes amused myself with thinking how I could best pitch into myself, and I believe I could give two or three good digs." Darwin was not a controversialist, being advised as he said by Lyell, "never to get entangled in a controversy, as it rarely did any good and caused a miserable loss of time and temper."

If one wishes to spend a few hours profitably, one cannot do better than to read "The Life and Letters of Charles Darwin," including an autobiographical chapter, by his son Francis Darwin.

And if one desires to get some idea of the physiognomy of Darwin, let him go to the American Museum of Natural History in New York, where there was unveiled, last Friday (February 12th), a bronze bust of him, which is clever in conception and in execution. I shall never forget, as I saw the canvas removed, the impression I first received, as it seemed that I could think of nothing but Mount Shasta. The eyes, overarched with the prominent brows, seem as if they could look into the noon-day sun and penetrate its secrets; the nose and lips both indicate strong character, yet tempered with kindliness, and the massive wrinkled brow also adds to the distinction of this master mind of the nineteenth century.

It is a matter of pride that in the city of Philadelphia the epoch-making work of Charles Darwin first received official recognition, and it is also a matter of congratulation that in America he immediately found some of his most ardent friends and supporters.