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MR. DARWIN AND HIS WORK.

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THERE is just out a new American edition of Darwin's *Origin of Species*, with the latest corrections and additions of the author. This is the fifth revision since the publication of the work eleven years ago, and shows that the public interest aroused upon its first appearance has not abated but is still keen for every new contribution to the question. We shall possibly have to make up our minds after all that the *Origin of Species* is destined to a permanent place in the literature of science, if not indeed to take rank as a book that marks an epoch in the progress of our knowledge of nature. Such a book was Copernicus' *Revolutions of the Celestial Orbs*, which signalled the rise of modern astronomy. A book of this kind was Hutton's *Theory of the Earth*, which foreshadowed modern geology, and if it may seem presuming to name the *Origin of Species* in connection with works of such historic renown, I have only to say that it is done by those best qualified to judge,—the highest living authorities in natural history having characterized it as the *New Organon of Biology*.

It will not be uninteresting to dwell a little upon this circumstance of the reception which has been accorded to Mr. Darwin's views, and to note how they are regarded after ten years trial. That the public mind was thoroughly ripe for them, and quickly seized all the implications of the case, is shown by the fact that the critical battle burst into perfect fury upon the first publication of the book. It was quickly translated into nine foreign languages, and the fierceness of the controversy that followed showed that something beside the lower animals had entered upon the "struggle for existence." The antagonism was at first almost universal.

The great majority of scientific men shrugged their shoulders and pronounced it unsound science and bad philosophy, while the official care-takers of the Divine Government thundered their anathemas against the new-fangled treason, which threatened, it was said, to vacate the universe of its Ruler, and to degrade man into a beast. The attitude of the extreme opposition was well illustrated by an Edinburgh Free Church Professor, who said in a lecture "he should not shrink from calling it (the development theory) by its right name, and asked why they should be charged with a want of charity and with being the victims of theological bias, in saying that it was downright dark, dreary atheism. Human ingenuity had never been able to adduce one fact in support of this wretched theory. It was trifling with human intelligence to propose it. It was an outrage on common sense to ask us to ponder it." It is said to be hard work to "kick against nothing," and if so, the vigorous Professor must have wrenched himself badly in the six long lectures he gave in reply to these unsubstantial and groundless views.

Meantime with that considerable class whose business is investigation for truth's sake alone, Mr. Darwin's doctrines began rapidly to grow in favor. Honestly questioned at first they were subject to sharp critical scrutiny, and then began to be accepted with equal candor. The history of the human mind in its research into the order of nature furnishes no instance so remarkable as this of opinions at first decisively rejected as erroneous and obnoxious, and then so widely and promptly accepted after thorough examination—no other instance so impressive of that triumph over prejudice and surrender of life-long opinions when shown to be untenable, which is the highest result of scientific discipline. At the British Association for the advancement of science in 1859, the question became an apple of discord and roused a storm of indignant opposition; poor old Daubeny, the president being at his wits-end to regulate the turbulent conflict. On the other hand, at the recent meetings of that body, its presidents, Armstrong, Grove, and Hooker have recognized the new phase of biological inquiry and argued elaborately in favor of the advanced views; while Professor Huxley, an avowed and unqualified Darwinist, is president of the association for the present year. These views besides are more or less fully entertained by a large portion of the most intelligent membership, and notably by the younger naturalists.

In the American Association these ideas seem to have made their way more slowly. At the late meeting in Troy, however, if we are to judge by the reports, Darwin's views figured prominently. Prof. Meehan read a paper on one branch of Darwin's researches in which he had at first supposed him in error, but at last found him to be right. In the subsequent discussion, Dr. Gray the distinguished American botanist declared "that he had frequently attempted to catch Darwin tripping in this particular, and had referred to him many instances which he himself at the time considered opposed to the theory; but in every case he had been forced to withdraw his objection."

The correspondent of the *Evening Post*, writing from Troy, observes: "First and foremost, we miss Agassiz, with his piquant and sometimes petulant obstinacy, and his good nature shining through it. The old man has trained a school of vigorous and independent young naturalists, who do not accept the opinions of their master. Last year, at Salem, Cope, of Philadelphia, reverentially but thoroughly floored him in debate. Verrill, Morse, and others have keenly criticised a good deal of his work; and, in short, so long as Agassiz opposes the Darwinian philosophy, those young Darwinians will make it warm for him. It is now said that Alexander Agassiz has come out on that side, and that the Professor himself is only seeking for a loophole through which he may crawl to abandon the untenable fortress which he has so long and stoutly defended. Various explained, modified and limited,

Darwin's philosophy will doubtless be, but overthrown it will not be."

On the continent these views are also rapidly extending. They are prominently discussed at all the scientific conventions, and it is said they have been accepted much more cordially and unqualifiedly in Germany than in England. In 1859 Professor Gegenbauer published the "outlines of Comparative Anatomy," which has been accepted as an authoritative text book of the subject. He has this year issued a second and much enlarged edition, recast, and embodying the Darwinian philosophy. He speaks of the theory of descent with modification, through natural selection, as constituting a more important era in comparative anatomy than any other theory has ever yet done; and he regards comparative anatomy itself as one of the touchstones of its truth. Dr. Gegenbauer closes his sketch of the theories of the subject with the following words: "If we consider that the number of those who have mastered the theory and its real meanings and bearing, is though at present small, yet constantly increasing, and that, too, by accessions from the ranks of its former opponents, we begin to feel ourselves justified in looking for the accomplishment of an auspicious revolution by its means."

A distinguished example of such conversion from the ranks of the opposition is that of the eminent German naturalist Dr. Fritz Müller, who tested Mr. Darwin's views in their application to the crustacea, as Gray had done in some branches of botany. In his German work which bears so powerfully in favor of the new views, that it has been republished in England under the suggestive title of *Facts for Darwin*, Dr. Müller says: "A false supposition, when the consequences proceeding from it are followed further and further will sooner or later tend to absurdities and palpable contradictions. During the period of tormenting doubt—and this was by no means a short one—when the pointer of the scale oscillated before me in perfect uncertainty between the *pro* and the *con*, and when any fact tending to a quick decision would have been most welcome to me, I took no small pains to detect some such contradictions among the inferences as to the class of crustacea, furnished by the Darwinean theory. But I found none either then or subsequently. Those which I thought I had found were dispelled on closer consideration, or eventually became converted into supports for Darwin's theory."

Another conspicuous example of this "coming over" of a former opponent is furnished by Sir Charles Lyell—perhaps the most learned of living geologists, and who has powerfully contributed to give that science its present shape and direction. After having studied for fifty years the subject of life in connection with the past changes of the globe, and embodied the older views in all his numerous works, he has at length, in the tenth edition of his *Principles of Geology*, abandoned the old ground as untenable, and adopted the views represented by Mr. Darwin. These are certainly curious mental phenomena to take place in relation to a theory so "wretched" that "human ingenuity has never been able to adduce one fact in support of it."

Of Mr. Darwin's views I design to make no analysis in this place, but merely to show how his work is regarded in the scientific world. But as he is one of our contemporaries whose name will unquestionably be eminent in the distant future, a few words may be added in relation to his personal history.

In the first place Mr. Darwin is a marked illustration of one of his own leading doctrines—modification by descent, or the hereditary transmission of talent, the subject which has recently received so interesting an elucidation in Mr. Galton's book on hereditary genius. His paternal grandfather, Dr. Erasmus Darwin, author of the *Botanic Garden* and the *Zoonomia* was a naturalist of considerable eminence and of a speculative turn of mind. His father was a physician and an F. R. S., while his maternal grandfather was the celebrated Josiah Wedgewood, a man of inventive genius and of much force of

character, who originated the manufacture of the celebrated "Queens Ware," or "Wedgewood Ware." Prof. Silliman used to say it was a great thing to be born with a good education; Mr. Darwin had that advantage.

He was born at Shrewsbury in 1809, and attended the Shrewsbury school. He went for two years to the University of Edinburgh, and took his degree at Christ College, Cambridge, at the age of 22. His scientific acquirements were already so well known that he at once got the appointment as naturalist to accompany Captain Fitzroy of the Royal Navy in a voyage of scientific exploration round the world in H. M. S. Beagle. The expedition lasted five years, during which various countries and islands in many parts of the world were visited and their natural productions examined. The *Journal of Researches*, published after his return, established Mr. Darwin's reputation as a close cautious, accurate painstaking observer and a sound inductive reasoner. Of his numerous subsequent researches in various departments of natural history and all conducted with an accuracy and fidelity that won the admiration of his compeers, it is unnecessary here to speak. When fifty years of age he published his great work *The Origin of Species by Natural Selection*, the theory of which he had been developing for twenty years. Mr. Darwin was early elected a member of the Royal Society and has received from it the Royal medal, the Copley medal, and the Wollaston medal from the Geological Society. He has also received many honors from foreign scientific bodies.

In 1839 Mr. Darwin married his cousin, Emma Wedgewood, and shortly after took up his residence at Down, near Farnborough, in Kent. Here he has devoted himself to his favorite studies and to the care of a large family. His health was profoundly shattered during his protracted sea-voyage, from the effects of which he has never recovered; and although his labors for the last thirty years are altogether remarkable in their extent and thoroughness, they have been performed under the disadvantages of much bodily suffering and an invalid life. His friends who know the frailness of his health and the difficulty of his labors, are consequently reluctant to intrude themselves upon him.

It has been often remarked that Mr. Darwin's writings, free from every taint of egotism and arrogance, and imbued with the modesty of the genuine truth-seeker, are in these respects models honorable to science, and which his acrimonious assailants

would do well to imitate. This trait of his works is genuine, and springs from the unaffected and genial spirit of the man. Leading his mental life among the profounder harmonies of living Nature, and reverent toward her beautiful order, he is content with the quiet unimpassioned statement of such glimpses into her plan as he has been permitted to make. Nor is it too much to say that this repose of feeling rises into the genuine quality of faith; a faith grounded in knowledge, but extending into the unrealized and unknown—a trusting reliance in the wisdom by which the course of things is directed. With Mr. Darwin this is more than mere aimless sentiment; it is a guiding rule of life. In the domestic sphere, in the management of his children he is said to be severely distrustful of his own meddling, and to have a profound reliance upon Nature's care, tuition and discipline. This is a practical corollary from his doctrines; for if the policy of the world is that of a mighty unfolding; the working onward forever to higher life and greater good; and this by the deepest law of things, and largely independent of human agency, the logical lesson is certainly that of diminished anxiety and increasing trust. Mr. Darwin, therefore, only applies his own philosophy in refraining from much interference, satisfied as he is that the school of experience is under a wise, strict, and all-beneficent control.

