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 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.

Christian World

LOWLY FELLOW-CREATURES.

Mr. Darwin, the distinguished naturalist, who has done his best to convince us that we all sprang from a very humble stock, and who has certainly placed within easy reach even of unlearned readers vast stores of interesting information about the world in which we live and the creatures which inhabit it with us, has just added another book to the long list of his previous publications. He has chosen what to many readers will appear so unpromising a subject that they will be astonished to find how instructive, and, indeed, entertaining, his pages are. The full title of the volume is "The Formation of Vegetable Mould Through the Action of Worms, with Observations on their Habits." It is worth while to note that the study of this subject is by no means a mere momentary fancy, the temporary "craze" of a clever, scientific man; but it has engaged Mr. Darwin's attention more or less during something like half a century. As far back as 1837 he read a paper "On the Formation of Mould," before the Geological Society, in which he appears to have called attention to some of the curious facts set down in the present volume. In pursuing his investigations, Mr. Darwin has not only watched worms in their native haunts, but he has also kept them in pots in his study, and has exercised vast patience and ingenuity in ascertaining their methods of action and drawing inferences from them, and in estimating the results of their operations. The worm which crawls so helplessly at our feet, and which supplies us the readiest and most obvious emblem of feebleness and insignificance, is now presented to us as a creature of some intelligence, of very considerable skill, of remarkable industry, and of very great usefulness in the Economy of Nature. Worms are, indeed, destitute of many faculties with which creatures of a higher order are endowed, but such faculties as they have they seem to use to very good purpose. As to their intelligence, Mr. Darwin devotes many pages to the description of tests applied by him which seem to show that they are capable of forming a judgment and of shaping their action in accordance with it, so far at any rate as the dragging of objects into their holes is concerned. The faculty thus exercised Mr. Darwin regards as distinguishable from mere instinct, and he observes that they "act in nearly the same manner as a man would under similar circumstances." In preparing their "burrows" they display a skill and ingenuity, which, seem to work in accordance with the same great law by which birds construct their nests, or, to take perhaps a more fitting comparison, by which beavers build their places of retreat. They have a nervous system, and, as everybody has observed, are extremely sensitive to the touch; although, on grounds which we should be glad to see more fully set forth, Mr. Darwin appears to have arrived at the conclusion that they do not suffer so much pain from injury and mutilation as their writhing would seem to indicate. For the sake of the worms, we can only hope that Mr. Darwin is right. There is evidence to show that "worms have played a very considerable part in the burial and concealment of several Roman and other buildings in England." The most interesting and most important part of their activity, however, is that which relates to the fine layer of mould which is found upon the surface of the earth, and to which vast spaces often largely owe their fertility and beauty. The statement would be incredible were it not that the evidence for it is irresistible, that the whole of the superficial bed of mould upon a great part of this country has passed many times and will pass many times again, through the bodies of worms, and in undergoing this

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