SOME NEW BOOKS.

Darwin's Letters.

It appears that but a small part of Darwin's correspondence was turned to account in "The Life and Letters of Charles Darwin," which was published in 1887. Not only have many additional letters come to light since that date, but even of those which were then accessible the majority were not printed in the work just named, either for want of space or for other reasons. The material hitherto unused includes much correspondence of scientific and biographical interest with Sir Joseph Hooker, Sir Charles Lyell, Fritz Müller, Mr. Huxley, and Mr. Wallace. Both new and valuable, therefore, are the data collected in the two volumes entitled *More Letters of Charles Darwin*, edited by FRANCIS DARWIN (Appletons). The letters are prefaced with an outline of Charles Darwin's life, and they are elucidated by copious annotations. The arrangement of the correspondence is satisfactory. The letters are classified according to subject, and those relating to a given subject are grouped chronologically. Of course, it is not always easy to decide in which of the groups a particular letter should be placed. In such a case the editor has avoided mutilation and allowed references to one branch of science to remain in a letter mainly concerned with another topic. We shall here pass over the correspondence which deals with the geographical distribution of species, with geology, botany, vivisection, and miscellaneous subjects, and confine ourselves to the letters which treat of evolution, and, primarily, of the descent of man. These letters are grouped in five chapters, and, taken together, occupy about five hundred pages.

I.

It is well known that Charles Darwin and Mr. A. R. Wallace simultaneously discovered and formulated the theory set forth in the "Origin of Species." The fact is less familiar, if it be a fact, that Mr. Wallace was the first publicly to moot the question whether, from the general theory, a particular deduction could be drawn with regard to man. At all events, he was the first to discuss the evolution of man in any detail from the viewpoint of natural selection, namely, in a paper published in the *Anthropological Review and Journal of the Anthropological Society*, May, 1864. The author sent a copy of the paper to Darwin; and the deep interest with which the latter read it is manifest, we are told, from the continuous pencil marks along the margins of the pages. What he thought of it is shown in a letter written to Wallace on May 28, 1864. We condense parts of it:

"The great leading idea [in Wallace's paper on man] is quite new to me—viz., that during late ages the mind would have been modified more than the body; yet I had got as far as to see with you that the struggle between the races of man depended entirely on intellectual and moral qualities. The latter part of the paper I can designate only as grand and most eloquently done. I am not sure that I go with you on all minor points. When reading Sir G. Grey's accounts of the constant battles of Australian savages, I remember thinking that natural selection would come in, and likewise with the Esquimaux, with whom the art of fishing and managing canoes is said to be hereditary. I rather differ on the rank, under a classificatory point of view, which you assign to man; I do not think any character simply in excess ought ever to be used for the higher divisions. Ants would not be separated from other hymenopterous insects, however high the instincts of the one, and however low the instincts of the other." Mr. Wallace had written on May 10 to Darwin: "I was led to the subject by the necessity of explaining the vast mental and cranial differences between man and the apes, combined with such small structural differences in other parts of the body—and also by an endeavor to account for the diversity of human races, combined with man's almost perfect stability by Darwin in his letter would be equally uncertain in its results. "In the very lowest tribes there is rarely much polygamy, and women are more or less a matter of purchase. There is also little difference of social conditions, and I think it rarely happens that any healthy and undeformed man remains without wife and children. I very much doubt the often-repeated assertion that our aristocracy are more beautiful than the middle classes. I allow that they present specimens of the very highest kind of beauty, but I doubt the average. I have noticed in country places a greater amount of good looks among the middle classes, and, besides, we unavoidably combine, in our idea of beauty, intellectual expression and refinement of manner, which often make the less appear the more beautiful. Mere physical beauty—i. e., a healthy and regular development of the body and features approaching to the mean and type of European man—I believe is quite as frequent in one class of society as the other, and much more frequent in rural districts than in cities." The apprehension is expressed by Mr. Wallace that, with regard to the rank of man in zoölogical classification, he had failed to make himself intelligible. "I never meant to adopt Owen's, or any other such views, but only to point out that, from one point of view, he is right. I hold that a distinct *family* for man, as Huxley allows, is all that can possibly be given him zoölogically. At the same time, if my theory is true—that, while the animals which surrounded him have been undergoing modification in all parts of their bodies to a generic or even family degree of difference, he has been changing almost wholly in the brain and head—then the geological antiquity, the *species*, man, may be as old as many mammalian families, and the origin of the *family* man may date back to a period when some of the *orders* first originated."

In the same letter from which we have been quoting, Mr. Wallace exhibits extraordinary generosity by ascribing to Darwin priority in the discovery of the principle to which the term "natural selection" has been applied: "As to the theory of Natural Selection itself, I shall always maintain it to be actually yours and yours only. You had worked it out in details I had never thought of years before I had a ray of light on the subject, and my paper would never have convinced anybody, or been noticed as more than an ingenious speculation, whereas your book has revolutionized the study of natural history, and carried away captive the best men of the present age. All the merit I claim is the having been the means of inducing you to write and publish at once."

Wallace's later views concerning the evolution of man were set forth in the *Quarterly Review* for April, 1869. They are distinctly opposed to Darwin's. In that article he maintains that the brain of man, as well as the organs of speech, the hand and the external form could not have been evolved by natural selection. In one paragraph he writes: "In the brain of the lowest savages, and, as far as we know, of the prehistoric races, we have an organ little inferior in size and complexity to that of the highest types. But the mental *requirements* of the lowest savages, such as the Australians, or the Andaman islanders are very little above those of many animals. How, then, was an organ developed so far beyond the needs of its possessors? Natural selection could only have endowed the savage with a brain a little superior to that of an ape, whereas he actually possesses one but very little inferior to that of the average members of our learned societies." This passage is marked in Darwin's copy of the article with a triply underlined "No!" and with a shower of notes of exclamation. The editor of these volumes believes it to have been the first occasion on which Darwin realized the extent of the great and striking divergence in opinion between himself and Mr. Wallace.

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ing benevolence and sympathy in not fostering the weak and diseased would be greater than by allowing them to survive and then to procreate."

On page 377 of the first volume will be found reprinted a letter dated Sept. 23, 1878, and first published in *Nature* March 5, 1891, together with a note from the late Duke of Argyll, in which the latter stated that the letter had been written to him by Darwin in reply to the question, "Why it was that he did assume the unity of mankind as descended from a single pair?" The Duke added that, in the reply, Darwin "does not repudiate this interpretation of his theory, but simply proceeds to explain and defend the doctrine." On a former occasion the Duke of Argyll had "alluded as a fact to the circumstance that Charles Darwin assumed mankind to have arisen in one place, and, therefore, in a single pair." The letter from Darwin was published in answer to some scientific friends who doubted the fact and asked for a reference on which the statement was based. We reproduce Darwin's words: "The problem which you state so clearly is a very interesting one, on which I have often speculated. As far as I can judge, the improbability is extreme that the same well-characterized *species* should be produced in two distinct countries or at two distinct times. It is certain that the same *variation* may arise in two distinct places, as with albinism or with the nectarine on the peachtree. But the evidence seems to me overwhelming that a well-marked *species* is the product, not of a single or of a few variations, but of a long series of modifications, each modification resulting chiefly from adaptation to infinitely complex conditions (including the inhabitants of the same country), with more or less inheritance of all the preceding modifications. Moreover, as variability depends more on the nature of the organism than that of the environment, the variations will tend to differ at each successive stage of descent. Now it seems to me improbable in the highest degree that a species should ever have been exposed in two places to infinitely complex relations of exactly the same nature during a long series of modifications. An illustration will perhaps make what I have said clearer, though it applies only to the less important factors, inheritance and variability, and not to adaptation—viz., the improbability of two men being born in two countries identical in body and mind. If, however, it be assumed that a species at each successive stage of its modification was surrounded in two distinct countries or times by exactly the same assemblage of plants and animals and by the same physical conditions, then I can see no theoretical difficulty in such a species giving birth to the new form in the two countries." It obviously does not follow from this letter that Darwin believed mankind to have descended from a single *pair*. In a letter addressed to G. Bentham and dated Nov. 25, 1869, he distinctly says: "I dispute whether a new race or species is necessarily, or even generally, descended from a single *pair* of parents. The whole body of individuals, I believe, become altered together—like all domestic breeds, which are changed through 'unconscious selection' by man."

On April 9, 1880, Prof. Huxley lectured at the Royal Institution on "The Coming of Age of the Origin of Species." Writing to Darwin about the lecture, Huxley says: "I hope you do not imagine, because I had nothing to say about 'Natural Selection,' that I am at all weak of faith on that article. But the first thing seems to me to be to drive the fact of evolution into people's heads. When that is once safe, the rest will come easy." Darwin's answer is dated about a month later: "I saw your motive for not alluding to 'Natural Selection,' and quite agreed in my mind in its wisdom. But, at the same time, it occurred to me that you might be giving it up, and that, any how, you could not allude to it without various 'provisos' too long to give in a lecture.

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In his answer to the letter above condensed Mr. Wallace writes: "In my paper on man I aimed solely at showing that brutes are modified in a great variety of ways by natural selection, but that in none of these particular ways can man be modified, because of the superiority of his intellect. I therefore, no doubt, overlook a few smaller points in which natural selection may still act on men and brutes alike. Color is one of them, and I have alluded to this in correlation to constitution in an abstract I have made for the *Natural History Review*. At the same time, there is so much evidence of migrations and displacements of races of men and so many cases of peoples of distinct physical characters inhabiting the same or similar regions, and also of races of uniform physical characters inhabiting widely dissimilar regions, that the external characteristics of the chief races of man must, I think, be older than his present geographical distribution, and the modifications produced by correlation to favorable variations of constitution be only a secondary cause of external modification." Mr. Wallace goes on to say: "With regard to the constant battles of savages, leading to the selection of physical superiority, I think it would be very imperfect and subject to so many exceptions and irregularities that it could produce no definite result; for instance, the strongest and bravest men would lead, and expose themselves most, and would therefore be most subject to wounds and death. And the physical energy which led to any one tribe delighting in war might lead to its extermination by inducing quarrels with all surrounding tribes and leading them to combine against it. Again, superior cunning, stealth and swiftness of foot, or even better weapons, would often lead to victory, as well as mere physical strength. Moreover, this kind of more or less perpetual war goes on among all savage peoples. It could lead, therefore, to no differential characters, but merely to the keeping up of a certain average standard of bodily and mental health and vigor. No such selection of variations adapted to special habits of life, as fishing, paddling, riding, climbing, &c. In different races, no doubt, it must act to some extent, but will it be ever so rigid as to induce a definite physical modification, and can we imagine it to have had any part in producing the distinct races that now exist?"

Mr. Wallace was inclined to believe that the sexual selection suggested prehistoric races, we have an organ little inferior in size and complexity to that of the highest types. But the mental *requirements* of the lowest savages, such as the Australians, or the Andaman islanders are very little above those of many animals. How, then, was an organ developed so far beyond the needs of its possessors? Natural selection could only have endowed the savage with a brain a little superior to that of an ape, whereas he actually possesses one but very little inferior to that of the average members of our learned societies." This passage is marked in Darwin's copy of the article with a triply underlined "No!" and with a shower of notes of exclamation. The editor of these volumes believes it to have been the first occasion on which Darwin realized the extent of the great and striking divergence in opinion between himself and Mr. Wallace.

In 1869, Francis Galton published his "Hereditary Genius: An Inquiry Into Its Laws and Consequences." About a year later, Darwin wrote to him: "I have only read about fifty pages of your book, but I must exhale myself, else something will go wrong in my inside. I do not think I ever in all my life read anything more interesting and more original. You have made a convert of an opponent in one sense, for I have always maintained that, excepting fools, men did not differ much in intellect, but only in zeal and hard work. I still think this is an eminently important difference."

Is it true that the sense of color has been but recently acquired by man? We find the following observation in a letter addressed by Darwin in 1877 to Dr. Ernst Krause, who had answered the question in the negative: "I attended carefully to the mental development of my young children, and with two, or, as I believe, three of them, soon after they had come to the age when they knew the names of all common objects, I was startled by observing that they seemed quite incapable of affixing the right names to the colors in colored engravings, although I tried repeatedly to teach them. I distinctly remember declaring that they were color-blind, but this afterward proved a groundless fear." Darwin mentions that, on communicating this fact to another person, he was informed that a nearly similar case had been noticed. He inferred that the difficulty which young children experienced, either in distinguishing or in naming colors, deserved further investigation. He added that "it formerly appeared to me that the gustatory sense, at least in the case of my own infants, and very young children, differed from that of grown-up persons. This was shown by their not disliking rhubarb mixed with a little sugar and milk, which is to us abominably nauseous, and in their strong taste for the sourest fruits, such as unripe gooseberries and crab-apples."

Under date of Nov. 15, 1878, Darwin refers to an article in which Francis Galton had proposed certificates of health as conditions of marriage, and had argued that only the men and women who were physically best should be mated. "I have lately been led," we read, "to reflect a little on the [proposed] artificial checks [upon procreation], but doubt greatly whether such would be advantageous to the world at large in the present, however it may be in the distant future. Suppose that such checks had been in action during the last two or three centuries, or even for a shorter time in Britain, what a difference it would have made in the world, when we consider America, Australia, New Zealand and South Africa. No words can exaggerate the importance, in my opinion, of our colonization for the future history of the world." Darwin adds: "If it were universally known that the birth of children could be prevented, and this were not thought immoral by married persons, would there not be great danger of extreme profligacy among unmarried women, and might we not become like the *arrees*' societies in the Pacific? In the course of a century, France will tell us the result in many ways, and we can already see that the French nation does not spread or increase much." From the same letter we learn that Darwin was opposed to the suggested checks upon procreation on the part of weakly and diseased persons. He was disposed to think that "the evil which would follow by checking individuals, I believe, become altered together—like all domestic breeds, which are changed through 'unconscious selection' by man."

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"If I think continuously on some half dozen structures, of which we can at present see no use, I can persuade myself that Natural Selection is of quite subordinate importance. On the other hand, when I reflect on the innumerable structures, especially in plants, which, twenty years ago, would have been called simply 'morphological' and useless, and which are now known to be highly important, I can persuade myself that every structure may have been developed through Natural Selection. It is really curious how many out of a list of structures which Bronn enumerated as not possibly due to Natural Selection, because of no functional importance, can now be shown to be highly important. Lobed leaves was I believe, one case, and only two or three days ago Frank [Darwin] showed me how they act in a manner quite sufficiently important to account for the lobing of any large leaf. I am particularly delighted at what you say about domestic dogs, jackals and wolves, because, from mere indirect evidence, I arrived in 'Varieties of Domestic Animals' at exactly the same conclusion with respect to the domestic dogs of Europe and North America—the conclusion, namely, that domestic dogs descend from more than one wild species. See how important in another way this conclusion is; for no one can doubt that large and small dogs are perfectly fertile together, and produce fertile mongrels; and how well this supports the Pallasian doctrine that domestication eliminates the sterility, almost universal between forms slowly developed in a state of nature?"

While the great achievement of Darwin's life was the demonstration that species are not independently created by the fiat of a higher power, he by no means regarded the Cosmos as a fortuitous product. In a letter to Lord Farrer, dated Aug. 23, 1881, he says: "If we consider the whole universe, the mind refuses to look at it as the outcome of chance—that is, without design or purpose. The whole question, however, seems to me insoluble, for I cannot put much or any faith in the so-called intuitions of the human mind, which have been developed, as I cannot doubt from such a mind as animals possess; and what would their convictions or intuitions be worth?" Darwin admits that, with his human mind, he cannot conceive of a chance-evolved universe, yet he does not deny that the inability to form such a conception may be due to limitations of his intellect.

We bring our extracts from these volumes to an end with a letter to R. Meldola, the translator of Prof. A. Weismann's "Studies in the Theory of Descent." Darwin had agreed to write a prefatory notice, and the translator of Weismann's book had suggested that he should point out by references to "The Origin of Species" and his other writings how far he had already traced out the path which Weismann went over. The suggestion was made because, in a great many of the Continental writings upon the theory of descent, many of the points which had been clearly foreshadowed, and in some cases even explicitly stated by Darwin, have been rediscovered and published as though original. Darwin wrote: "I am very sorry to say that I cannot accept your suggestion. An author is never a fit judge of his own work, and I should dislike extremely pointing out when and how Weismann's conclusions and work agreed with my own. I feel sure that I ought not to do this; and it would be to me an intolerable task. Nor does it seem to me the proper office of the preface, which is to show what the book contains, and that the contents appear to me valuable."

M. W. H.