

LITERATURE.

THE DESCENT OF MAN.*

The final result of Mr. Darwin's labours—the last stage of the theory of development—is reached in these two remarkable volumes, which form the climax and the crown of a speculation perhaps the boldest and grandest in which science was ever engaged. All the world is now informed of what is called the Darwinian theory, and has been prepared for the final announcement which its author had to make,—that man also—man, noble in reason and infinite in faculty; in form and moving express and admirable; in action like an angel, in apprehension like a god—man, the "beauty of the world, the paragon of animals," as Hamlet called him—conforms to the same law of existence as the rest of animated creation, and has been evolved, like any other member of the family, out of the simpler form into the more complex, through the cycles of years, by the operation of the law of development by natural selection. It was a conclusion which, of course, Mr. Darwin could not have resisted, and of which, indeed, he has always declared his full acceptance. He has led us up gradually through his former works to the last stage of the creative, or rather the developing, process, which is man.

We cannot attempt within our prescribed limits to give anything like a complete analysis of the enormous mass of evidence which Mr. Darwin has accumulated in support of his theory. It is in this part of his task, namely, in the masterly grouping of facts, that Mr. Darwin is happiest. Whether we assent to his deductions or not, it is impossible to refrain from admiring the singular lucidity, the scrupulous honesty, and the calm, philosophic spirit which he has brought to his argument. The method of research is of the very highest order of science, whatever opinions there may be as to the value of the results. The object of his present work is stated by Mr. Darwin himself to be threefold—first, to consider whether man, like every other species, is descended from some pre-existing form; secondly, the manner of his development; and thirdly, the value of the differences between the so-called races of man. The first question Mr. Darwin answers by a decided affirmative. After

win answers by a decided affirmative. After a comparison of the bodily structure of man with that of other animals, he comes to the conclusion—which is indeed accepted now by anatomists and physiologists of all countries—that there is nothing in the human body which is not analogous to something in the bodies of all the lower animals. Man is but the most highly developed form of animal life. He is constructed on the same general model with the rest of the creatures. There is no part of them which is not represented in him, and no part of him which does not exist in some degree in them. In the early stages of life the human embryo is scarcely to be distinguished from that of a dog or a seal. Even that which is held to be the most characteristic part of the lower vertebrate animals—the tail—exists in a rudimentary form in the human *os coccygis*, which exhibits traces of the early function of which it has, in course of time, been deprived. And so on through every other portion of the human frame. Mr. Darwin's conclusion is therefore that—

"The homological construction of the whole frame in the members of the same class is intelligible if we admit their descent from a common progenitor, together with their subsequent adaptation to diversified conditions. On any other view the similarity of pattern between the hand of a man or a monkey, the foot of a horse, the flipper of a seal, the wing of a bat, &c., is utterly inexplicable. It is no scientific explanation to assert that they have all been formed on the same ideal plan. With respect to development, we can clearly understand, on the principle of variations supervening at a rather late embryonic period, and being inherited at a corresponding period, how it is that the embryos of wonderfully different forms should still retain, more or less perfectly, the structure of their common progenitor. No other explanation has ever been given of the marvellous fact that the embryo of a man, dog, seal, bat, reptile, &c., can at first hardly be distinguished from each other. In order to understand the existence of rudimentary organs, we have only to suppose that a former progenitor possessed the parts in question in a perfect state, and that under changed habits of life they have become greatly reduced, either from simple disuse, or through the natural selection of those individuals which were least encumbered with a superfluous part, aided by the other means previously indicated.

"Thus we can all understand how it has come to pass that man and all other vertebrate animals have been constructed on the same general model, why they pass through the

animals have been constructed on the same general model, why they pass through the same early stages of development, and why they retain certain rudiments in common. Consequently we ought frankly to admit their community of descent; to take any other view is to admit that our own structure and that of all the animals around us is a mere snare laid to entrap our judgment. This conclusion is greatly strengthened if we look to the members of the whole animal series, and consider the evidence derived from their affinities or classification, their geographical distribution and geological succession. It is only our natural prejudice, and that arrogance which made our forefathers declare that they were descended from demi-gods, which leads us to demur to this conclusion. But the time will before long come when it will be thought wonderful that naturalists, who were well acquainted with the comparative structure and development of man and other mammals, should have believed that each was the work of a separate act of creation."

The final conclusion to which Mr. Darwin has come is that "man is the co-descendant with other mammals of a common progenitor." Our immediate ancestor, in fact, is declared to be "a hairy quadruped, furnished with a tail and pointed ears, probably arboreal in its habits, and an inhabitant of the Old World." This is not a pedigree very flattering to human pride, and such as the heralds and Mr. Disraeli would reject, but after all it is a question of pure

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science and of nothing else. As Mr. Darwin says, we need not be ashamed of such a descent if we regard the matter in the proper light. "The most humble organism is something much higher than the inorganic dust under our feet; and no one with an unbiassed mind can study any living creature, however humble, without being struck with enthusiasm at its marvellous structure and properties." How we arrived from the first rude sketches of life to our present elaborate organisation, physical and moral, and by what steps we ascended, this is what Mr. Darwin proposes to show us.

"The most ancient progenitors in the kingdom of the vertebrata at which we are able to obtain an obscure glance apparently consisted of a group of marine animals, resembling the larvæ of existing Ascidiæ. These animals probably gave rise to a group

These animals probably gave rise to a group of fishes, as lowly organised as the lancelet; and from these the Ganoids, and other fishes like the Lepidosiren, must have been developed. From such fish a very small advance would carry us on to the amphibians. We have seen that birds and reptiles were once intimately connected together; and the Monotremata now, in a slight degree, connect mammals with reptiles. But no one can at present say by what line of descent the three higher and related classes, namely, mammals, birds, and reptiles, were derived from either of the two lower vertebrate classes, namely, amphibians and fishes. In the class of mammals the steps are not difficult to conceive which led from the ancient Monotremata to the ancient marsupials; and from these to the early progenitors of the placental mammals. We may thus ascend to the Lemuridæ; and the interval is not wide from these to the Simiids. The Simiids then branched off into two great stems, the New World and Old World monkeys; and from the latter, at a remote period, man, the wonder and glory of the universe, proceeded."

How from the ancestral Ascidian we mounted upwards through successive stages to the fish, from the fish to the amphibian, from the amphibian to the mammal, from the mammal to the perfect monkey, from the monkey to the human savage—this cannot be shown by positive documents, but it may be deduced by analogy. The manner of development is through the law of variation, a law which holds good as well in the lowest as in the highest forms of life. It is variation which first produces the almost imperceptible differences in individuals, from which individual differences we get to species, from species to orders. The causes of variation are infinite and dependent upon minute and inappreciable changes of habit, upon the effects of increased use or disuse of parts, accidental arrests of development, reversion, correlation, the struggle for existence, and the law of natural selection. The close of this struggle of life, of this process of gradual evolution, is marked by the appearance of *Homo sapiens* on the scene. The improved monkey gradually lost his tail until it disappeared altogether into the vertebral column, then he began to raise himself on his feet, and his hands lost their brute character, and became fit for the throwing of missiles, and the fashioning of tools. His brain, by exercise of instinct, became larger, instinct grew into intelligence, and intelligence found vent in language. The animal lost his hair by successive inter-

animal lost his hair by successive interbreeding of the least hairy, and came forth at last in his complete shape, such as we see in the Australian black, in the African Bushman, or the Fijian. This is the process which Mr. Darwin holds to have taken place, and in support of his view he has collected a vast amount of curious and interesting facts, arranged with great skill, and told with a clearness and simplicity which make his book most charming reading, whether we accept his theory or not. In fact, it is not too much to say of it that no scientific speculation was ever given to the world in such a fascinating form, with so much wealth of philosophic research, with so much courage and modesty.

Of course the great difficulty which Mr. Darwin has to encounter is to explain the moral superiority of man to his supposed relations. This he faces without flinching. He contends that the germs of all human moral feelings are to be found in the lower animals. He quotes numerous instances of unselfishness, of heroism, of the highest human virtues, in the brutes. He summarises his reasoning on this point as follows:—

"There can be no doubt that the difference between the mind of the lowest man and that of the highest animal is immense. An anthropomorphous ape, if he could take a dispassionate view of his own case, would admit that though he could form an artful plan to plunder a garden—though he could use stones for fighting or for breaking nuts, yet that the thought of fashioning a stone into a tool was quite beyond his scope. Still less, as he would admit, could he follow out a train of metaphysical reasoning, or solve a mathematical problem, or reflect on God, or admire a grand natural scene. Some apes, however, would probably declare that they could and did admire the beauty of the coloured skin and fur of their partners in marriage. They would admit, that though they could make other apes understand by cries some of their perceptions and simpler wants, the notion of expressing definite ideas by definite sounds had never crossed their minds. They might insist that they were ready to aid their fellow apes of the same troop in many ways, to risk their lives for them, and to take charge of their orphans; but they would be forced to acknowledge that disinterested love for all living creatures, the most noble attribute of man, was quite beyond their comprehension.

"Nevertheless, the difference in mind between man and the higher animals, great as it is, is certainly one of degree and not of kind. We have seen that the senses and intentions, the various emotions and faculties,

intentions, the various emotions and faculties, such as love, memory, attention, curiosity, imitation, reason, &c. of which man boasts, may be found in an incipient, or even sometimes in a well-developed condition, in the lower animals. They are also capable of some inherited improvement, as we see in the domestic dog compared with the wolf or jackal. If it be maintained that certain powers, such as self-consciousness, abstraction, &c. are peculiar to man, it may well be that these are the incidental results of other highly-advanced intellectual faculties; and these again are mainly the result of the continued use of a highly developed language. At what age does the new-born infant possess the power of abstraction, or become self-conscious, and reflect on its own existence? We cannot

answer; nor can we answer in regard to the ascending organic scale. The half-art and half-instinct of language still bears the stamp of its gradual evolution. The ennobling belief in God is not universal with man; and the belief in active spiritual agencies naturally follows from his other mental powers."

The precise method by which the original Ascidian rose into man Mr. Darwin, of course, does not pretend to explain. He can only suggest some of the ways by which the higher forms have been evolved out of the lower. It was inevitable that many parts of the process should be inexplicable. We cannot tell, for instance, how man should have come to be hairless, although his immediate progenitor was hairy. Mr. Darwin endeavours to account for it by the operation of the law of "Sexual selection;" that is, the law which prompts either the male or the female of any animal to choose its partner; but this explanation is not quite satisfactory. We can understand how the anthropoid ape should have come to perceive the advantage of being able to stand on his feet and of using his hands in other ways than in climbing. But to the original man, as to the perfect ape, it was necessary that his body, in default of clothes, should be covered with hair. The most hairy individuals, we might expect, would be those who would be the fittest to survive the struggle of life, and to propagate their kind. The law of correlation does not explain the difficulty, for although we can understand that as the ape began to walk upright his pelvis became broader and the position of his skull altered, it is not evident why, as he became more man, he lost his hair. The

tion of his skull altered, it is true, as he became more man, he lost his hair. The gradual decay of the tail would of course follow, from the disuse of that member and its degradation by being sat upon. On these and other points, however, it does not follow that because Mr. Darwin can give no sufficient explanation his theory is materially injured. He does not profess to have exhausted all the processes by which man rose into his present form. He merely propounds a law by which he has risen, and fortifies his theory by as many illustrations and analogies as it was possible to gather. If he has persuaded us that man is produced, not by one act of creation but through successive acts, he has accomplished his purpose. As for the religious objection which has been urged against the Darwinian theory, our philosopher only condescends to notice it briefly once, by asking those who denounce his views as irreligious to show "why it is more irreligious to explain the origin of man as a distinct species by descent from some lower form, through the laws of variation and natural selection, than to explain the birth of the individual through the laws of ordinary reproduction? The birth both of the species and of the individual are equally parts of that grand sequence of events which our minds refuse to accept as the result of blind chance. The understanding revolts at such a conclusion, whether or not we are able to believe that every slight variation of structure, the union of each pair in marriage, the dissemination of each seed, and other such events, have all been ordained for some special purpose."

A very large portion of this present work is devoted by Mr. Darwin to a consideration of the law of what he calls "sexual selection." By this he means the influence exercised over the creation and the variation of species, through the advantage which certain individuals have over other individuals of the same sex and species, in exclusive relation to reproduction:—

"When the two sexes follow exactly the same habits of life, and the male has more highly developed sense or locomotive organs than the female, it may be that these in their perfected state are indispensable to the male for finding the female; but in the vast majority of cases, they serve only to give one male an advantage over another, for the less endowed males, if time were allowed them, would succeed in pairing with the females, and they would in all other respects, judging from the structure of the female, be equally well adapted for their ordinary habits of life. In such cases sexual selection must have come into action, for the males have acquired their present structure, not from being better fitted to survive in the

have acquired their present structure, not from being better fitted to survive in the struggle for existence, but from having gained an advantage over other males, and from having transmitted this advantage to their male offspring alone. . . . There are many other structures and instincts which must have been developed through sexual selection, such as the weapons of offence and the means of defence possessed by the males for fighting with and driving away their rivals; their courage and pugnacity, their ornaments of many kinds, their organs for producing vocal and instrumental music, and their glands for emitting odours; most of these latter structures serving only to allure or excite the female. That these characters are the result of sexual, and not of ordinary selection, is clear, as unarmed, unornamented, or unattractive males would succeed equally well in the battle of life, and in leaving a numerous progeny, if better endowed males were not present."

The facts accumulated by Mr. Darwin in illustration of his theory range over all the families of the animal kingdom, and are most curious and interesting. If we have any fault to find with this portion of his book, it is, indeed, that the argument is somewhat overlaid by instances, and is almost lost sight of altogether before we come to the end of the 500 pages which are devoted to its illustration. After all, the influence of sexual selection, undoubted as it is, can only have played but a secondary part in the formation of species. We grant that in the process of the struggle for life the more highly ornamented and powerful males would prevail over their rivals less favoured in these respects and that by the constant preference thus given to them by the females, new and improved types of the individual animal would be in course of time formed. But how does this account for the main steps of animal development? We can understand that in course of time the stronger and more courageous game-cock would give his stamp to the whole breed of game fowls, and that, if left to natural or to artificial selection, the whole breed would grow from worse to better. But we are still in the dark as to how the *gallinaceæ* came from the order below them, and how the next order above came from them. This is, of course, the crucial difficulty of the problem which Mr. Darwin has undertaken to solve. But because he has not been able to solve it altogether, it does not follow that the process which he has indicated is wrong. It is inevitable that the great question of how life came into the world should be enveloped in mystery. Man cannot lift the veil which shrouds the past. He can only attempt arguing from the known to the un-

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known, to obtain glimpses of the great secret of the universe. This is what Mr. Darwin has attempted, and no more. He does not pretend to have solved the question. He only propounds a law of solution, based upon a strictly inductive process. And it is only fair to him to say that he does not ignore the operation of other causes than those which he has indicated which may have influenced the evolution of species, and given us man as the final result of the work of creation. It only remains for us, while appending the very striking passage in which Mr. Darwin sums up the fruits of his labours, to declare that a work of greater importance, or of a higher philosophic spirit, has never appeared in any country, or one more remarkable to science.

"The main conclusion arrived at in this work, namely, that man is descended from some lowly-organised form, will, I think, be highly distasteful to many persons. But there can hardly be a doubt that we are descended from barbarians. The astonishment which I felt on first seeing a party of Fijians on a wild and broken shore will never be forgotten by me, for the reflection at once rushed into my mind--Such were our ancestors. These men were absolutely naked, and bedaubed with paint, their long hair was tangled, their mouths frothed with excitement, and their expression was wild, startled, and distrustful. They possessed hardly any arts, and like wild animals lived on what they could catch. They had no government, and were merciless to every one not of their own small tribe. He who has seen a savage in his native land will not feel much shame if forced to acknowledge that the blood of some more humble creature flows in his veins. For my own part I would as soon be descended from that heroic little monkey who braved his dreaded enemy in order to save the life of his keeper; or from that old baboon who, descending from the mountains, carried away in triumph his young comrade from a crowd of astonished dogs--as from a savage who delights to torture his enemies, offers up bloody sacrifices, practises infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions.

"Man may be excused for feeling some pride at having risen, though not through his own exertions, to the very summit of the organic scale; and the fact of his having thus risen, instead of having been aboriginally placed there, may give him hopes for a still higher destiny in the distant future. But we are not here concerned with hopes or fears, only with the truth as far as our reason allows us to discover it. I have given the evidence to the best of my ability; and one must acknowledge, as it seems to me, that man with all his noble qualities, with sympathy which feels for the most debased, with benevolence which extends not only to other man, but to the simplest living creature, with his

god-like intellect which has penetrated into the movements and constitution of the solar system--with all these exalted powers--man still bears in his bodily frame the indelible stamp of his lowly origin."