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ment and suffer from ennui, as may be seen with dogs and monkeys. They feel wonder and curiosity. "Brehm gives a curious account of the instinctive dread which his monkeys exhibited toward snakes; but their curiosity was so great that they could not desist from occasionally satiating their horror in a most human fashion, by lifting up the lid of the box in which the snakes were kept. I was so much surprised at his account, that I took a stuffed and coiled-up snake into the monkey-house at the Zoological Gardens, and the excitement thus caused was one of the most curious spectacles which I ever beheld. Three species of *Cercopithecus* were the most alarmed; they dashed about their cages and uttered sharp signal-cries of danger, which were understood by the other monkeys. A few young monkeys and one old Anubis baboon alone took no notice of the snake. I then placed the stuffed specimen on the ground in one of the larger compartments. After a time all the monkeys collected round it in a large circle, and, staring intently, presented a most ludicrous appearance. They became extremely nervous; so that when a wooden ball, with which they were familiar as a plaything, was accidentally moved in the straw, under which it was partly hidden, they all instantly started away. These monkeys behaved very differently when a dead fish, a mouse, and some other new objects, were placed in their cages; for, though at first frightened, they soon approached, handled and examined them. I then placed a live snake in a paper bag, with the mouth loosely closed, in one of the larger compartments. One of the monkeys immediately approached, cautiously opened the bag a little, peeped in, and instantly dashed away. Then I witnessed what Brehm has described, for monkey after monkey, with head raised high and turned on one side, could not resist taking momentary peeps into the upright bag, at the dreadful object lying quiet at the bottom. It would almost appear as if monkeys had some notion of zoological affinities, for those kept by Brehm exhibited a strange, though mistaken, instinctive dread of innocent lizards and frogs. An orang, also, has been known to be much alarmed at the first sight of a turtle."

Many animals have the power of imitation; all have the faculty of attention. They have excellent memories for persons and places. Nor are they destitute of imagination, or of the reasoning faculty to a certain extent. "Many facts have been recorded in various works showing that animals possess some degree of reason. I will here give only two or three instances, authenticated by Rengger, and relating to American monkeys, which stand low in their order. He states that when he first gave eggs to his monkeys, they smashed them and thus lost much of their contents; afterward they gently bit one end against some hard body, and picked off the bits of shell with their fingers. After cutting themselves only once with any sharp tool, they would not touch it again, or would handle it with the greatest care. Lumps of sugar were often given them wrapped up in paper; and Rengger sometimes put a live wasp in the paper, so that in hastily unfolding it they got stung; after this had once happened, they always first held the packet to their ears to detect any movement within. Any one who is not convinced by such facts as these, and by what he may observe with his own dogs, that animals can reason, would not be convinced by anything that I could add."

It has been alleged that man alone is capable of progressive improvement. But every one who has had any experience in setting traps knows that young animals can be caught much more easily than old ones. With respect to old animals, it is impossible to catch many in the same place, and in the same kind of trap, or to destroy them by the same kind of poison. They learn caution by seeing their brethren caught or poisoned. Our domestic dogs are descended from wolves and jackals, and, though they may not have gained in cunning, they have advanced in certain moral qualities, as in affection, trustworthiness, temper, and probably in general intelligence. The common rat has conquered several other species throughout Europe, in parts of North America, New-Zealand, and China. The victory over a much larger kind may be ascribed to the superior cunning of the common rat; and this quality is probably due to the habitual exercise of all its faculties in avoiding extermination by man, as well as to his having successively destroyed nearly all the less cunning or weak-minded rats.

It has often been said that no animal uses a tool. But the chimpanzee in a state of nature cracks a native fruit, somewhat like a walnut, with a stone. An American monkey has been taught to break open hard palm-nuts, and afterward, of its own accord, it used stones to open

other kinds of nuts, as well as boxes. It thus also removed the soft rind of fruit that had a disagreeable flavor. Another monkey was taught to open the lid of a large box with a stick, and afterward it used the stick as a lever to move heavy bodies. In these cases, stones and sticks were employed as implements; but they are likewise used as weapons. In Abyssinia, when the baboons of one species descend in troops from the mountains to plunder the fields, they sometimes encounter troops of another species, and then a fight ensues. The

first party rolls down great stones, which the others try to avoid, and then both species rush furiously against each other with a terrible uproar. A monkey in the Zoological Gardens which had weak teeth used to break open nuts with a stone. The same animal, after using the stone, would hide it in the straw, and would not let any other monkey touch it. Here we have the idea of property, but this idea is common to every dog with a bone, and to most or all birds with their nests.

We have selected a few of the popular illustrations which are brought by Mr. Darwin to explain the affinities between man and the inferior animals, which, in his view, compel us to refer the origin of both to a common, but long since extinct, progenitor. They afford an example of the scope and method of his reasonings, but present only an imperfect idea of the variety and richness of his suggestions. Many of the topics of primary importance in the discussion, and which he unfolds at length, cannot even be alluded to in our limited space, and we must refer our readers for their explanation to the volume itself. A word or two as to the development of the "rude forefathers" of our race must close this imperfect notice. In the primeval state of society, the individuals who were the most sagacious, who invented and used the best weapons or traps, and who were best able to defend themselves, would rear the greatest number of offspring. The tribes with the largest number of men thus endowed would increase in number and supplant other tribes. As soon as the progenitors of man became social (which probably occurred at a very early period) the mental faculties would receive an important aid in the principle of imitation, together with reason and experience. The habitual practice of each new art must in some slight degree strengthen the intellect. In order that primeval men, or "the ape-like progenitors of man," should have become social, they must have acquired the same instinctive feelings which impel other animals to live in a body. They would have felt some degree of love for their comrades; they would have warned each other of their danger; and have given mutual aid in attack or defense. This implies a certain amount of sympathy, fidelity, and courage. A tribe possessing such qualities in a high degree would be victorious over other tribes, but in the course of time would in its turn be overcome by some other and still more highly endowed tribe. Thus the social and moral qualities, which now form the chief distinction of the race, would tend slowly to advance and be diffused throughout the world.

With regard to the bearing of his theory on the dignity of the human race, Mr. Darwin offers a few pregnant suggestions which illustrate the spirit in which he has prosecuted his labors. "Thus we have given to man a pedigree of prodigious length, but not, it may be said, of noble quality. The world, it has often been remarked, appears as if it had long been preparing for the advent of man; and this, in one sense, is strictly true, for he owes his birth to a long line of progenitors. If any single link in this chain had never existed, man would not have been exactly what he now is. Unless we willfully close our eyes, we may, with our present knowledge, approximately recognize our parentage; nor need we feel ashamed of it. The most humble organism is something much higher than the inorganic dust under our feet; and no one with an unbiased mind can study any living creature, however humble, without being struck with enthusiasm at its marvelous structure and properties."

Whatever judgment may be pronounced as to the tendency of Mr. Darwin's views of the origin of man to humble the natural pride of ancestry, we ought not to lose sight of the fact that no philosophical writer of the present day sets forth a more exalted conception of the actual faculties and endowments of the race as developed under the highest forms of moral and religious culture in the progress of civilization. He almost goes out of his way to do justice to the ideas and beliefs which have been regarded by the wisest thinkers in every age as the crowning glory of humanity. In this respect, his system presents a favorable contrast to the shallow, sensualistic, French philosophy of the eighteenth century, which resolves the most refined sentiments of our nature into fleshly illusions. "The question," says Mr. Darwin, "whether there exists a Creator and Ruler of the Universe has been answered in the affirmative by the highest intellects that have ever lived." "I fully subscribe to the judgment of those writers who maintain that of all the differences between man and the lower animals, the moral sense or conscience is by far the most important. This sense, as Mackintosh remarks, 'has a rightful supremacy over every other principle of human action; it is summed up in that short but imperious word OUGHT, so full of high significance. It is the most noble of all the attributes of man, leading him without a moment's hesitation to risk his life for that of a fellow creature; or after due deliberation, impelled simply by the deep feeling of right or duty, to sacrifice it in some great cause.'"

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DARWINIANISM.*

Mr. Darwin's observations, researches and speculations have placed him in the very highest rank among Naturalists. Whatever may be the ultimate verdict concerning the group of theories that is summarily expressed by the word Darwinianism (a word which has now as recognised a meaning, and as general and classic an acceptance as Platonism, Epicureanism, or as the terms Baconian, Newtonian, and Cartesian) yet assuredly Mr. Darwin will be remembered in future times as one of those commanding intellects who have opened new realms of speculation, and founded new epochs in science. In the work before us Darwinianism culminates, and the explanations given in previous works of the origin of species, and of the changes produced in animal organisation by the varied operations of the laws of selection, receive here their extremest application. Even when the exposition of these laws was confined to the lower races, such bold theorising concerning the origin of species could not be shut up in the halls of science or in the schools of philosophers. The general public soon became stirred by such exciting speculations, and hastened with more or less knowledge and skill

to share in the discussion. It was felt that these theorizings could not stop short at the lower races, but that man must be included in their scope. Mr. Darwin now boldly brings the races of men under the keen analysis of his philosophical methods, and, as might be expected, assigns to man as an animal, as a part of the great system of nature, a history similar to that of other animals. He claims for him a descent from inferior but related forms of life,—and places him in the Catarrhine group of animals; a splendid monkey with the addition of a higher reason, and therefore with new capabilities of intellectual and social development. Perhaps Mr. Darwin speaks too confidently of the acceptance of his theories among competent judges, when he assumes the almost universal assent of the best naturalists to his conclusions. That man is a glorified ape we must be allowed to regard at present as an open question. It is manifestly so in general society. We are not yet so accustomed to grub at the roots of our genealogical trees as to be able to reach such a result without some emotion. We may accept the Plantagenets and the Normans, or the Patriarchs and Antediluvians, as our progenitors with some satisfaction, but we shudder as we pass these *en route* to some wandering primitive savage, or some non-human ape. In mercy to our pride of birth and blood, which is after all a creditable sort of pride, we must beg that this question may be an open one a little longer.

We may be allowed, however, to assume that, as a scientific question, the Book of Genesis settles nothing at all about the natural history of the animal we call man. Whoever Adam may be, it seems to us that his history represents the advent of the divine element into humanity, and not the entrance of humanity itself upon the surface of the earth. Scripture grandly ignores man till the breath of a divine life is breathed into him, and leaves us free to range the earth in search of traces of the human or simply animal occupants of the planet before this last and highest development was attained. From this time humanity became a unity—"one blood"—whatever tributary streams might have existed in separate channels antecedent to this event. It seems to us that there is a strong analogy between the advent of Christianity among the religions of the world, and the birth of the Divine life in the earliest history of man. Christianity affirms all the scattered and isolated truths half articulately uttered by other faiths, and blends them into one. And so, if it is affirmed by science that the Pre-Adamite man was derived by one or many streams of descent from half-human savages or non-human lower types of animal life, yet it is no less true that these lower roots of humanity are effectually buried in the earth, and that, since the crisis of human history which is represented by the word or the fact which we are told to call *Adam*, there is a Divine glory cast upon humanity which nothing in the past can efface, and which blends all the races of man into one indestructible unity.

If this be granted, we really see no good reason why we should fall into nervous tremors when science traces the undoubtedly strong analogies between the human form, in its structure and development, and those of lower animals—even if the conclusion deduced from these analogies should be exactly what Mr. Darwin affirms. If such be our origin, we are disposed to say, not "So much the worse for the man," but rather, "So much the better

DARWINISM?

Mr. Darwin's observations, researches and speculations have placed him in the very highest rank among Naturalists. Whatever may be the ultimate verdict concerning the group of theories that is commonly expressed by the word Darwinism (a word which has done us no good, and acquired a meaning, and so general and elastic an acceptance as Platonism, Epistemology, or in the terms Baconian, Newtonian, and Cartesian) yet assuredly Mr. Darwin will be remembered in future times as one of those extraordinary intellects who have opened new fields of speculation, and founded new sciences in science. In the work before us Darwinism is explained, and the explanations given in previous works of the origin of species, and of the changes produced in animal organization by the varied operations of the laws of selection, receive here their extensive application. Even when the expounding of these laws was confined to the lower races, each held themselves concerning the origin of species could not be shut up in the halls of science or in the schools of philosophy. The general public have become stirred by such stirring speculations, and furnished with more or less knowledge and skill

to share in the discussion. It was felt that these discussions could not stop short at the lower races, but that man must be included in their scope. Mr. Darwin now boldly brings the race of man under the keen analysis of his philosophical methods, and, as might be expected, assigns to man as an animal, as a part of the great system of nature, a history similar to that of other animals. He claims for him a descent from inferior but related forms of life,—and places him in the Catarrhine group of animals; a splendid monkey with the abilities of a higher race, and therefore with new capabilities of intellectual and social development. Perhaps Mr. Darwin speaks too confidently of the acceptance of his theories among competent judges, when he assumes the almost universal assent of the best naturalists to his conclusions. That man is a glorified ape we must be allowed to regard at present as an open question. It is manifestly so in general society. We are not yet so accustomed to grub at the roots of our genealogical trees as to be able to reach such a result without some reaction. We may accept the Platyrrhine and the Nothura, or the Ptilinche and Lepidopithecus, as our progenitors with some satisfaction, but we shudder as we pass them in review to some wandering primitive savage, or some non-human ape. In many to our pride of birth and blood, which is after all a veritable sort of pride, we must beg that this question may be an open one a little longer.

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If this be granted, we really see no good reason why we should fall into serious trouble when science traces the undoubtedly strong analogies between the human form, in its structure and development, and those of lower animals—very if the conclusion deduced from these analogies should be exactly what Mr. Darwin affirms. "If such beings exist, we are disposed to say, not, 'He made the worm for the man,' but rather, 'He made the better

For the time? We do not think the alternative has been sufficiently indicated by either the advocates or the opponents of Darwinism. One of the greatest puzzles which both metaphysicians and theologians have had to encounter is that suggested by the instincts of animals. What is there that does not again and again, puzzled over the question that is instinct? What are those half or quite spiritual attributes in animals which excite our wonder and interest, and even bring them within the circle of our human sympathy and affection? Is that faithful companion whom we have loved to regard with almost heartily affecting a place of animated dead, or an immortal being like ourselves? Now, if Darwinism be true, we may infer that some of the glory and prerogative of man is reflected back upon the inferior animals, and that they may be expected to share his destiny as far as they are capable of doing so. The contrary belief that any possible alliance with lower forms of life is a degradation to man, is, we think, utterly shallow and unphilosophical. It is always safer to interpret the lower by means of the higher, than to pursue the opposite course and bring the higher to the level of the lower. As in Philosophy it is safer and wiser to descend than to ascend, so in Biology it is wiser to ascend.

and deeper wisdom to apply the facts and laws of human nature to explain the analogous phenomena of lower levels of life, than to remember our high ideal of humanity when we find little and insignificant inferior races which seem to regard them with surprise. Therefore, if science leaves our philosophy in some Darwinian manner, we would by no means be ashamed, but frankly accept the distinction in the matter, while wishing to all that we know of what is highest and best in man. The very repugnance with which we are apt to regard the grotesque caricatures of humanity which we see in the Zoological Gardens seems to involve an unconscious and secretly existing recognition of the Darwinian theory when it is thus illustrated upon us in such so effectively degrading style in these inferior distortions of the human form, and much of the repugnance against Darwinism is nothing more than a reflection of the instinctive reaction which is excited by a wish to the contrary sense. This surely is unjust. Scientific conclusions should not be held down, which, like a dagger left off, or they will probably be equally rejected with haste and violence. Persons who merely misinterpreted Darwinism, and doubt for or against it rather by their own than by their intellect, cannot possibly arrive at any conclusion about it worthy of respect. On the other hand, those who take as some indication in favour of Darwinism that it leaves the metaphysical and theological character of the inferior animals unchanged, meaning and a higher interest, and while degrading nothing from man, adds to the worth of the inferior races.

Mr. Darwin was a naturalist, and he is primarily an observer, and his books are a storehouse of the most various and interesting facts in all departments of natural history. It is quite possible to find abundant illustration in his books as to his former works, quite apart from his philosophy, in the study and contemplation of the multitudinous facts by which he illustrates or supports his conclusions. The most important argument in favour of his theory of man's descent from inferior races, is that of the striking analogies between the structure and development of the human body and that of animals belonging to groups in most relation to man. Mr. Darwin argues that there are certain peculiarities in man's structure that require to be accounted for—organs and apparently meaningless organs or modifications of parts; occasional appearances of peculiar forms not at present characteristic of man at all, corresponding to what is known in other parts as vestigial or earlier types; passing phases in embryonic development not related to any present structure in the mature animal. When these peculiarities of structure are traced in other animals, they are generally explainable by reference to homologous forms in other species, and indicate a relationship which is clearly established, whether the explanation is accepted or not, by the ultimate identity of the related species.

Are these facts of nature, Mr. Darwin asks, to receive a different interpretation in man to that which they bear in other animals? Are they concerning and unconnected facts of nature only intended to mislead us? Geology asked the same question once, and has obtained a satisfactory reply. Mr. Darwin "proves" for the most part in his department.

In former volumes Mr. Darwin has endeavoured to show how, by processes of "natural selection," species very gradually change their forms and habits, and yet retain traces of their old condition. In the present his endeavour is to show what direct natural selection has had in modifying man; or how circumstances which determine the pecking of animals gradually fix themselves as variations on the original stock. The argument therefore for the descent of man from other races is not to be taken by itself; it only emerges as a further explanation of laws which are copiously illustrated in inferior animals.

Mr. Darwin in his argument assumes that the intellectual and moral nature of man differs only in degree, and not in kind from that of the lower animals. This is, we think, the weakest part of his theory. It is moreover quite unnecessary as a link in his chain of reasoning, and is hardly not deducible from his premises. We think it would be quite fair for scientists to draw what conclusions they like, so far as they fairly can, from an examination of the bodily structure of man, as well as from all the applications, instincts, passions or tendencies that are distinctly to be correlated with animal structures by a large induction among all varieties of animal life. But in the spiritual phenomena of humanity we cannot help feeling that there is that which requires a source of far superior origin, in order that it may be explained. A spiritual, reasoning mind combined with a sensitive, and with a perception of the Infinite and Divine, is regarded by many of what Darwin long calls "divergent degrees" from all animals yet so cultured, and whatever may be the history of his bodily organization is more obscure, and claims higher affluence than any which nature history can afford. Have the typical material steps in, and shows that in all the ascending scales of life, the typical steps lead into a final element that the fact has not disappeared, while the last were into an element which to the typical and false is an unapproachable region. So the birds themselves are left behind by man as the highest of the mammals, when he takes a new and higher volitional flight, and leaves to move and breathe in the long plane ether of infinite and absolute freedom. Thus much of the ascending scales down below to mammals is introduced into an element unknown to the lower forms.

We do not forget that there are such things as flying fish and reptiles, and we are willing to allow that here and there we see flashes of intelligence among the lower races which are almost like an ascent into the higher ether of humanity. But, besides denying for an analogy only what it is worth, we believe that the qualities that belong to humanity are at least as far removed from anything that materialists have been able to deduce in the lower animals, as the air is from the water. The real lesson that Darwinism might teach us, according to this analogy, is that as the fish does not breathe the air which the water is which it lives in, in relation, so is there a real separation between the highest intelligence of man and the lowest instincts of inferior animals, and that each higher rank of life leads that the inferior life it has reached does not interfere and enhance the lower which has not learnt to apprehend it. Say what that connection is we hardly think a science of nature can explain. That must be left to a new science which we hope man is not farly recognized, the science of the supernatural—the science that reveals the laws which are implied in all the higher capacities of man, all that raised him above lower forms of life, and above himself to a more recent of ordinary laws of evolution; all that makes him in any possible sense of the word a supernatural being.

Meanwhile, in all slavery we wish Mr. Darwin God-speed in his inquiries and operations. He is such an earnest worker after truth that he can calmly await the development of human knowledge and opinion, and count his views to the safe custody of history. He has himself well remarked, and with this we take our leave of him, that—"False facts are highly injurious to the progress of science, for they often long endure; but false views, if supported by some evidence, do little harm, as every one takes a voluntary pleasure in proving their falsehood; and when this is done, the path towards error is closed, and the road to truth is often at the same time opened." Vol. II, p. 203.

* *The Descent of Man, and Selection in Relation to Sex.* By CHARLES DARWIN, F.R.S., &c. Two vols. (London: Murray, 1871.)