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THE VARIATION OF ANIMALS AND PLANTS UNDER
DOMESTICATION.*

WHEN Dr. Darwin says (vol. 2, p. 487) "not only that various domestic races, but the most distinct genera and orders within the same great class—for instance, whales, mice, birds, and fishes—are all the descendants of one common progenitor," and when he argues that our domestic breeds, of horses, dogs, bees, &c., despite their striking differences, descended from a single species, we feel that he is essentially a monogenist. The want of it is, that he is not content without being a monogenist and ascending theory. It is true that he admits that all the races of man are variations from one type, but he goes on to hint at the probability that all the animal kingdom came, by course of self-evolution, from the direct primitive system, which "wield" to produce a permanent leg, and then, by a *long formation*, split itself up into various species. Monogenist or not, this is plainly not the orthodox view; and the defender of the literal reading of the early chapters of Genesis will say there is some hope even of the polygenist, M. Fossil, than of him who denies it. But Dr. Darwin does not care to keep up a reputation for orthodoxy. He disputes the theory that different species were created just as much as he does the idea that man has only existed some 5,000 years on the face of the earth. His great argument for monogenism in the case of the dog is, that man has been on the earth an indefinitely long period, and that, therefore, we cannot doubt that the sub-varieties marked, for instance, in the Egyptian mastiff, are too distinct to have diverged so much in so short a time, for (says Dr. Darwin) it was not a short time; and the man of the Neolithic period, at any rate, had already domesticated the dog.

And yet Dr. Darwin most anxiously labours to do away with the notion that by his "principle of selection"—or "survival of the fittest," as Mr. Herbert Spencer calls it—in which he diverges from the functions of the Creator, and to assign a sort of power of independent action to the creature. The Creator he compares to

an architect who should rear a noble and commodious house without the use of any tools, by selecting from the fragments at the base of a previous well-finished house for his walls, chimneys, gables, &c. These fragments of stone, indispensable to the architect, bear to the office the same relation which the descending varieties of each species bear to the varied and ultimate structures ultimately acquired by its modified descendants. And we need not say that natural selection explains nothing unless the precise cause of each slight individual difference be made clear, for it might be quite impossible to give the precise shape of each fragment in the building which we have surveyed, while yet the man would be most unreasonable who should insist that nothing had been made clear to him, when the use of the flat and wedge-shaped, and other stones for roof, and arches, &c., had been pointed out.

Such is Dr. Darwin's illustration of his theory. As to the shape of the rocky fragments being accidental, that is not, of course, strictly true. Their shape would depend on a long sequence of events all shaping natural laws; but in regard to the use to which the fragments may be put, their shape may be strictly said to be accidental. Here Dr. Darwin confesses that he is travelling out of his province; yet he cannot help maintaining that, if words have any meaning, it is unreasonable to say that the Creator intentionally selected the fragments in certain certain shapes that the builder might use them for certain parts of his edifice; and so, in like manner, it cannot be asserted that the specially selected for the sake of the breeder such of the innumerable variations in our domestic animals and plants—varieties often of no use to man, for more often actually injurious to the creature themselves. Did he, for instance, mean the frame and moral qualities of the dog to vary in order

* The Variation of Animals and Plants Under Domestication. By Charles Darwin, M.A., F.R.S., &c. In two volumes, with Illustrations. London: John Murray, 1868.

Can a law be found of considerable generality, with laws fitted to fit down the ball by one's hand again?

But, if we give up the principle in one case, no student of nature can be assigned for the belief that variations arise in nature and the result of the more general laws, which have been the ground-work, through natural selection, of the formation of the most perfectly adapted organism in the world, now existing, were intentionally and specially guided.

Professor An Conway wishes to believe that "variations have been led along certain beneficial lines like a stream along rocks and water flows of Niagara." No (says Dr. Darwin), in this view the possibility of reproduction which leads to every species derivation of structure, and the independent power of reproduction which causes the struggle for existence, would be superfluous laws of nature; whereas, an omniscient and omnidivine Creator must have ordained and foreseen everything. Thus the difficulty remains, as insuperable (Dr. Darwin mentions) as that of free will and necessity.

Though Dr. Darwin's view of facts, we are distinctly of opinion that his present work will not be convincing to any but a Darwinian. He attempts to prove too much: as he himself confesses, "to consider the subject under this point of view"—"its original identity of origin, kind, time"—"is enough to strike us dumb with amazement." He is so, indeed; but will more wisely lead to reflect on what effects facts as read a hypothetical legend. Dr. Darwin is very modest; he only goes to forward in a hypothesis: and he promises us two other books, one on the varieties of organisms in a state of nature, the other on the struggle for existence and the law of natural selection. But we possess we repeat believe that because domesticated organisms have a great tendency to vary—therefore, in the lapse of infinite ages, the dog was developed out of the wolf, or the wolf and the fox, which themselves came from the modification of some earlier form, and vice, tracing backwards to the ape.

It is a great conviction which Dr. Darwin demands from nature laws, in fact, than the abandonment of any real difference between species and variety, making species nearly a permanent variety. The polygamist at once see the weak point here, and even in M. Pasteur's work, that "varieties under domestication" throws no light on the natural modification of species." Their formal objection is, we all know, that while a cross between the most widely-separated varieties is invariably sterile, a cross between the most closely allied variety is always sterile. This was the old argument of Linnæus and Gmelin against the paper's claim to be admitted as a brother. "He is a distinct species; for the cross, though often fertile for a generation or two, invariably dies out soon unless crossed from either of the parent stocks." This M. Quatrefages and other incompetent met by a denial of the fact; and so Dr. Darwin would reply to the supposed primary difference between species and variety—"It is impossible to prove a negative; and you have no more right to assert that hybrids are never fertile than I have to say that they are fertile if made under a collision of circumstances, and to maintain that under any circumstances a new form might be established which should not be a mere temporary variety." On this point we await Dr. Darwin's forthcoming book. At present, he is content to remind us, that not all varieties give a fertile crop, and that Pallas may be right in asserting that species, after having long domesticated, lose their natural tendency to sterility when crossed. He also adds, that too much has been made of the supposed radical difference between species and variety. 'Tis truly, while it was well known that some allied animals are very differently affected by the same poison, e.g., the sheep and the goat, it was believed that varieties all had the same; now, however, it has been proved that immunity from certain poisonous attacks in some cases is correlated with the colour of the hair: e.g., white cattle were poisoned by certain plants, and cattle with white spots had the spots influenced, the rest of the skin remaining sound, after eating the same plants. The period of gestation, too, assumed to be the same for all varieties, has by recent research been proved to differ in some cases. Are we then to conclude that there is no such thing as species in the old sense of the word, and that all we see about us are permanent varieties, brought about by natural selection, clashing at the hereditary variations of the individual, and throwing off any variations which are found useless? It is, perhaps, as well to leave the question as to species and variety till Dr. Darwin is able to deal with the varieties of organisms in a state of nature.

Meanwhile, we recommend the book, not only to those who care for the author's peculiar theory, but to all who are interested in

natural history. There is a vast mass of facts brought together as a first instalment of prime justification for the Origin of Species. We all remember that that remarkable book dealt more in assertion than in proof. Dr. Darwin has now supplied half the proof; indeed, for those who are willing to accept the analogy of domestic variation, he has thoroughly established his case. We prefer, as we said, to wait till he has treated of animals in a state of nature in the same exhaustive manner. It is unfortunate, The amount of facts which he has brought together is perfectly marvellous; and many of them—all, for instance, that he says about the bones and the leg, and their variations—are full of interest for the general reader. Whether or not we accept Dr. Darwin's theory, it is interesting to look at his findings, which, when first taken to India, will fit us as displaced in the ground by the track, in two or three generations not only tell off in pluck and tenacity, but have the underlying character of their lower jaws. Indians, too, domesticate even more rapidly in hot climates. Our findings, by the way, are greatly reduced in size owing to the discontinuance of hunting. Peacocks, again, come from Spain; but a few centuries have so modified them that there is no trace now in Spain corresponding to figures with our peacocks. Horses vary some with our dogs. In mountain ranges and islands they always get small. In the islands off Virginia they have almost away (scarcely not owing to the cold) almost to the size of hares. In the Falkland Isles, again, they soon become too weak to be used with the hares for catching wild seals; or which proper hares have to be imported from La Plata. Very little more so much that all over the vast island area from Calcutta up to cold China no full-sized horse is bred. The woolly horse of Borneo, by the way, is not a unique animal; you see tallish horses and woolly horses and other "varieties" all over, there would be breeds possessing characteristics combined. These are samples of Dr. Darwin's facts—very interesting, we repeat to the all sorts of readers. They are accompanied by chapters which can only be read with pleasure by those already well acquainted with the subject—the chapter, for instance, on "Fragments—" a hypothesis resting on the assumption that all organs, again, besides having the power of growing by cell-division, throw off free and minute atoms of their substance, i.e., molecules." This hypothesis shows such facts as variability, divergence, reversion, or sterility, &c.; and in its favour Dr. Darwin quotes Dr. Whewell, to the effect, that a good hypothesis is as valuable in the investigation of truth as a well-chosen relation is in mathematics. We deal fully with chapters like this a long while within reasonable limits of space. Every one knows that Dr. Darwin, when he writes for the philosopher is sure to win his attention. We have said enough about the more popular part of his book to show that it gives him a claim on the general, and on the wholly scientific, reader.

GOD IN HISTORY.*

THIS great work comes to us with a double recommendation. It is, we consider, the most masterly, if not the most masterly, achievement of Baron Bunsen's genius. It is rendered into good and graceful English by the accomplished translator of *Taste's Germany*, and, lastly, it is prefaced by an introduction by Dean Stanley. In addition to these recommendations, we may remark that the chapters on the Indian Religions have been revised by Professor Max Müller, and that the illustrations from the classical poets are from the elegant pen of Professor Colington. In a few brief sentences, which we shall quote, Dean Stanley puts before us his view of the character of Baron Bunsen as a theological writer, and the two key-words of this, his great work, which expresses "more than any single treatise he has left, that which was the central idea of all his various works—the development of the revelation of God through all the various phases of human history." "No theologian of this generation," continues the Dean, "had a truer reverence for the Bible, both in the Old and New Testament. What others talked of their abridgement of it, he proved it by his untiring labour to bring out its meaning, to apply its lessons, to illustrate its truths and its history, from the resources of a knowledge unusually vast and varied, from the devotion of a heart and life of unusual depth and expansion. This is one side of the book here translated. But not less clearly does it bring out his equally strong conviction,

* *God in History; or, the Progress of Man's Work in the Moral Order of the World.* By G. C. F. Baron Bunsen. London: Longmans, 1866.