shall be unable to disturb our peace, and where our prayer shall be fulfilled which we address to Him Whom St. Paul declared to the Athenians, "That we, which know Thee now by faith, may, after this life, have the fruition of thy glorious Godhead."

DARWIN ON THE ORIGIN OF SPECIES*.

Mr. Darwin looks round upon the world of nature and sees many different species of animals and plants in various degrees of developed organisation. He asks Whence are they? Are they each of them the result of a separate act of creation, performed at successive periods during the vast ages of past time? or are they one and all the result of gradual development through the operation of natural laws from some few originally-created species, which are the progenitors of all existing species, however numerous and widely different from one another? It is this latter theory which he has adopted. He supposes that there may have been some four or five original progenitors of all existing species of animals, and perhaps as many original progenitors of all the existing species of plants (p. 572). It will thus be seen that he makes man, the highest of existing organizations, the cousin or brother of very many of the existing species of animals, while he makes him descended from some organism of the very lowest kind, without limb, nerve, or tissue (p. 223).

This theory of his Mr. Darwin supposes not to be opposed to religion, and he quotes the words of a celebrated author and divine to the effect that it is just as noble a conception of the Deity to believe that He created a few original forms capable of self-development into other and needful forms, as to believe that He required a fresh act of creation to supply the voids caused by the action of His own laws (p. 569).

We freely allow that Mr. Darwin's theory is not inconsistent with the idea of natural religion. It acknowledges a Creator. It acknowledges that life and organization spring from Him as their source. We can see nothing whatever incredible in the idea that He might have chosen in this world of ours, or in any other worlds, to have made some few created things so created that, by the operation of the laws under which they were placed, they would give rise to other species of a higher organization, while they themselves should generally disappear from the scene when they had done their work. We see in it nothing more incredible, nothing more wonderful, than that any animal should produce another of its own exact type.

But there are some still who believe in revealed religion, and believe that that religion is revealed in those ancient writings which the Jewish and Christian churches have accepted as Divine. We are among these. It is therefore that we view with jealousy such theories as Mr. Darwin's. If man be sprung from some lower organism, the account of his creation in the book of Genesis is but a myth. If man be cousin to the lizard, the baboon, or the monkey, the scriptural accounts of sin and of redemption can scarcely be supposed less mythical than its account of creation. We will, then, review this theory of Mr. Darwin, not the less fairly, we hope, because it is antagonistic to all we hold most dear.

Mr. Darwin's darling object is to get rid of miracle as much as possible. But little as he likes the miraculous he cannot dispense with it altogether. He rightly admits that the creation of a species is a miracle (p. 428). Now, as he cannot account for the origin of life without God, or for those first species from whence he supposes all existing species to have sprung without creation, he is compelled—rather against his will, we fear—to admit of some eight acts of creation, *i. e.*, of some eight distinct miracles wrought by God. But here he resolutely stops. Having admitted so much of miracle he will admit of no more. Scripture represents God as a perpetual worker, taking delight in His workmanship. Mr. Darwin does not like this idea of God. Accordingly, not only does he confine God's creative acts to some seven or eight, but he supposes them to have been wrought, not successively, but all at once. And he places this putting forth of the Divine energy at a period so remote that it may very well be forgotten. It was at a time so long gone by that the very records of geology do not pretend to reach it that Mr. Darwin supposes God to have worked His wonders. Thenceforward He ceases to work, or to interpose. Having once wrought He ceases to do so any more. He retires from all further interposition with this planet of ours, and becomes singularly like the deity of Epicurus.

But in admitting acts of creation on God's part, however few or however remote, Mr. Darwin abandons all plea on the ground of principle against subsequent similar interpositions. It is quite plain that He Who so worked at a very remote period may have so worked since, or may so work to-day. His doing so is mere matter of testimony: that He can do so, and that He may do so, Mr. Darwin admits. He holds that He has not done so, and that by the constitution of nature, as originally arranged by Him, there is no occasion that He should. Natural law, working upwards from the lowest organisms of original creation, is able to account satisfactorily for the origin of every species, however highly developed, that now exists upon the earth. This is the theory which, in our opinion, Mr. Darwin fails to sustain.

No existing of species of animals or plants, then, according to our author, at least no species which exhibits a development in the least degree raised above the simplest organism, came from God *as it is*. One and all were developed from the lowest condition to that which they now present to view. Man, the highest of all organisms, is the result of an infinite series of developments through past ages of vast duration. This theory of gradual development is that we will now consider.

Mr. Darwin's line of argument is this. He first treats of the wonderful capacity of variation which some species of animals and plants, perhaps every species, is capable of under al-

* "The Origin of Species," by Charles Darwin, M.A., F.R.S., &c., &c. Fifth edition. London, 1869.

tered conditions of life. He then brings before us that marvellous and rapid increase in numbers which every species is capable of through its power of reproduction, and which absolutely requires checks of various kinds to prevent a redundancy of numbers which could not possibly find support on the earth. He then shows that the extent of the reproductive powers produces of necessity a struggle for existence so severe that only a few out of many live their natural term of life, the greater part of each species perishing at various stages of existence and in various ways. From this severe and perpetual struggle for existence, he goes on to argue, arises, through what he calls natural "selection," a gradual development in individuals of different species of certain organs or qualities fitted to enable those individuals to battle successively for life, while other individuals of the same species, not so gifted, perish. The survivors propagate, through the hereditary principle which works so powerfully and universally through nature, those qualities and organs which were of such benefit to themselves. This struggle for existence, and this consequent natural selection, perpetually renewed, and going on ever through the vast ages of past time, has, according to Mr. Darwin, produced all existing species, in their present degrees of perfection, and may produce in time to come developments of a higher kind, though beyond a given point he does not suppose that there is any necessity or any likelihood that they should proceed (pp. 579, 411). Why the solemn procession of the ages is to come to a standstill is one of those numerous mysteries connected with his system on which Mr. Darwin takes no trouble to enlighten us. We should have supposed that once set going it would go on for ever, unless, indeed, one of those miraculous interpositions, which are such an offence to Mr. Darwin, arrested the ponderous machine of nature.

With respect to Mr. Darwin's first position, viz., that any given species of animal or plant is capable, under certain conditions of life, of wonderful and numerous variations, the varieties differing from each other as widely as they differ from their common progenitor, we can only say that here we quite agree with our author. Here we gladly learn from him more fully that which in a lesser measure we knew before. Here we willingly recognize the master walking in the domain of the known, each path and winding of which is so familiar to him. Here Mr. Darwin deals with facts which he knows how to marshal and arrange.

He points out to us that the sources of these variations are two-fold, natural and artificial. The natural sources of the variations of species are chiefly food and climate. These produce great variations; but these variations are chiefly confined, so far as observation goes, to varieties in size and in colour. We have the little Shetland pony and the horse of Arabia. We have various animals of a dark colour in temperate climates assuming a white colour in the regions of snow, and many other variations of a like kind arising from climatical causes, or the varieties of food, or both combined (pp. 42, 97).

Mr. Darwin then comes to an agency in the production of variety in species which we would call artificial selection, and which even Mr. Darwin is fain to confess a far more powerful agent within any given time; that being effected within the lifetime of a single man which he allows would take thousands of generations by his process of natural selection (pp. 33, 36, 92, 94). Here we are no longer left to an unconscious agency. We have an interposing mind; we have man effecting by his powers of observation and his ever watchful arrangements many and great varieties in different species. Man sees many species of animals and plants which would be of use to him. He takes them under his care: he domesticates them. He wants them for various purposes: he wants them for food, for strength, for speed, for beauty. He watches them as generation after generation is produced under his eye. He sees that variety is to a certain extent the law of their being. He sees that varieties appear, and disappear, and reappear from time to time from causes which he cannot even guess at. He knows of another great law of nature everywhere working with a mighty power—that law by which each creature gives birth to another like itself, the hereditary principle. Man, the conscious interposer, works on these two laws of nature regulating species—the capacity of variation, and the power of hereditary transmission of qualities. He wants strength. He selects the foal with the strong limbs from those of weaker power, couples it with another of like powers, and by careful and continued selection he produces the drayhorse. He wants speed. He selects the foal with lighter limbs, and by a similar care he produces the racehorse. So it is with those various species on which man thinks it worth his while to spend care and time and thought and money. And so we have the various races of cattle, fitted for the butcher or the dairy: we have those varieties of pigeon, the tumbler, the cropper, the fantail, the carrier, and others, all sprung from the *Columba livia*, the rock-pigeon of our sea coasts (pp. 21, 25).

In this field of observation Mr. Darwin is triumphant. No one disputes, and no one can dispute, that which passes under every man's observation who has eyes to see. We do not think that every species has the same capacity of variation which some possess, but to a certain extent we have no doubt that every species is possessed of a very considerable capacity of variation. If man thought it worth his while, we are satisfied he could produce wolves of a variety of colour, with ears of widely-different dimensions, with tails long or short or curled, with hair smooth or rough, and some much stronger and some much swifter than the rest. He has put the dog and the rabbit through such a process: we suppose he could make to pass through it with somewhat of a similar result the wolf or the bear.

This capacity of the variation of species is indeed a truth of natural science which we prize very highly, and which we are grateful to Mr. Darwin for having brought forward so powerfully as he has done. We believe in two books, the book of nature and the book of revelation,

We believe in both, because we believe them written by one hand. We believe that the utterances of both will be found in the end to coincide. We are satisfied that if they seem to differ, it is because we do not read one or other of them aright. We think that the book of nature will at times tell the divine that his interpretation of the book of revelation must be altered and was not correct. But with respect to that feature of Mr. Darwin's theory now before us, the marvellous capacity of variation under certain conditions of any species, we are glad to perceive in it a corroboration of a scriptural tenet now not unfrequently disputed, namely, the descent of the various varieties of man from one common progenitor. With Mr. Darwin to support us, we can look at the oval face of the Caucasian, the flattened skull of the Turanian, the thick lips of the negro, the oblique eyes of the Chinese, and the copper hue of the aborigines of America, and believe that all were sprung from Adam. We rejoice to think that in adhering to scripture we do not depart from nature.

But in that capacity of variation which probably every species possesses, and which some certainly possess to a very remarkable extent, and in all those variations which have been actually produced, whether by nature acting unconsciously or by man acting designedly—in all such variations, so far as they are known to us, and have passed under our observation, these two things, both of them most important in their bearing upon Mr. Darwin's theory, are to be noticed. First: Nature, *so far as we know*, effects no material change beyond varieties in size and colour. Secondly: Man, by artificial selection and treatment, effects within a given time results, such as nature is wholly unable to effect within an equal time, and has never effected within the period of time to which human knowledge extends. But, however great, marked, extraordinary, and capable of perpetuation by the same care that produced them, are the variations in species developed by man, all these varieties so produced show their identity of species by freely interbreeding with one another. And man, again, with all his art and care, has never been able to confound two distinct species, as the rabbit and the hare, the eagle and the partridge; nor, from any one species, to produce species which do not breed together or with individuals of the stock from which they were originally derived, and to which, if unguarded by the very same care that produced them, they show an unfailing tendency to revert. If the various classes of cattle in England were turned loose to range at will over its surface they would breed among one another, and the present varieties would in no very distant period give place to one uniform type. If the varieties of the rabbit were turned into one extensive warren they would lose those varieties of colour, ear, and eye, which now render them valued by the rabbit-fancier. If the varieties of our pigeons were forced from their boxes and lofts to the cliffs and rocks of our coasts, we should find the cropper, the tumbler, the fantail, the carrier, to merge once more in the wild rock-pigeon from whence they all sprung.

And now how does this bear upon or support Mr. Darwin's theory that existing species are sprung from species with which they cannot be identified; that species of a period gone by have produced through natural selection other species which show no tendency to revert to their progenitors; and that they have produced a variety of correlated species none of which acknowledge their affinity by breeding freely, if at all, between each other? It is quite plain that the varietion of any one species, whether produced naturally or artificially, so far as such varieties are known to us, is quite a different thing from Mr. Darwin's derivation from one species of a great many other species, all of them distinct from their progenitor and one another. The two things are perfectly unlike. There is no analogy between them. One cannot be inferred from, or even made probable by, the other.

We will make our meaning plainer by referring to examples of these different ideas. For the first we will take the case of the pigeon and its varieties on which Mr. Darwin dwells so often. From the wild rock-pigeon are derived several varieties, as the tumbler, cropper, fantail, carrier, &c. Mr. Darwin allows all these to be one in species with each other and their common progenitor, and they exhibit their unity of race by freely interbreeding with each other or with their common progenitor, and by their acknowledged tendency to revert, if no restraint on man's part were laid upon them, to the one original type. Now let us take an example of Mr. Darwin's theory of the origin of species. We will take man. Man, according to the last work of Mr. Darwin's which we have seen—his "Descent of Man," published in 1871—is probably descended from some hairy animal with a tail, the closest resemblance to such among existing species being the monkey and the baboon. But Mr. Darwin, with all his acquaintance with natural history and geology, is unable to point out to us any other species identical with man, or with which the human race would copulate and produce a progeny. Again, on Mr. Darwin's theory, man has among existing species a great many blood-relations, as the dog, the monkey, and the baboon. But dogs, monkeys, baboons, and men, do not, we are thankful to say, produce offspring from mutual intercourse. Between the case, then, of the pigeon and its varieties and Mr. Darwin's imagined progenitor of man and his correlated species, there is no analogy. The variations of one species do not afford any ground for the theory of the derivation of several distinct species from an original species, from which they are all as distinct as they are from one another. Mr. Darwin might have left out his chapters on the variation of species, whether under domestication or in a state of nature, without doing any injury to his argument. The origin of many species from one derives no support from the variations of any one species, in so far as those variations have come under our notice so as to enable us to judge.

Unable to find any support for his theory in the present world of nature as it comes under human observation and is regulated or altered by human skill, Mr. Darwin is, by his own confession, utterly unable to find any support from

it in those vast records of past ages into which geology gives us a little glimpse. Indeed he frankly acknowledges that geology presents many features apparently inconsistent with, if not fatal to, his views. Instead of that progressive development which we certainly should look for in every species accordidg to his theory, which makes the present elaborately-constructed forms of life to have been produced from lower forms "by laws acting around us" (p. 579), geology tells us that some of the lowest forms at least have remained for an enormous period in nearly their present state. And yet it is from the development of their lowest forms that any of the present highly-developed species can alone, according to him, have been produced (p. 145)! Instead of the gradual blending together through innumerable transitional links of the various species from the highest to the lowest, which his theory represents as having been the process of nature, geology presents to our view distinct specific forms, by no means gradually passing from the one into the other (p. 345). Other apparent inconsistencies there are between the science of geology and his theory which Mr. Darwin freely points out, but to which we have not space to advert. So numerous indeed are they and so important that Mr. Darwin confesses that anyone who accepts the geological record as "in any degree perfect," must undoubtedly reject his theory. He can only take refuge from this conclusion in the imperfection of geology as as a science. "I look," he says, "at the geological record, as a history of the world imperfectly kept, and written in a changing dialect; of this history we possess the last volume alone, relating only to two or three countries. Of this volume, only here and there a short chapter has been preserved; and of each page, only here and there a few lines. On this view the difficulties above discussed are greatly diminished, or even disappear" (p. 384).

If it is not presumptuous in one who can pretend to nothing beyond the most rudimentary acquaintance with geology to express an opinion, we would say that in Mr. Darwin's estimate of the science we agree. We have therefore brought it forward, not as absolutely overthrowing his theory, but as showing that, so far as this science is investigated, it not only affords no countenance to it, but bears an unfavourable aspect towards it. Neither in the records of human history, nor in the records of time to which human history does not reach, can Mr. Darwin find any support whatsoever for his theory of the origin of existing species.

HENRY COTSTABLE.

(To be continued.)

woman did—to humble ourselves, and seemingly sit at the feet of those we would gain; to communicate our knowledge by asking, "*Is* not this the Christ?" appearing to be inquirers and not teachers, as those who wish to learn, and not as those who wish to teach. Many have gained souls to Christ in this way, as the woman of Samaria did.

And now to sum up what we have been aiming to teach this evening. Let religion take hold of your feelings, and root itself in your hearts, as a mighty joy and as a powerfully active principle of love towards both God and man. Let it light up a holy and ever-burning fire of zeal in your soul, and make you ready to *every* good work. Let your love to God be warm and strong. Let your faith in Christ be vigorous and fruitful. And let your zeal be fervent and enduring. In seeking to bring sinners to Jesus act with wisdom, and take care your zeal is tempered with prudence and guided by discretion. Like this woman, act wisely, and be careful how you go about the work. Think before you make an attack. Consider the character and disposition of the man you would take captive. He may want very cautious handling, and must be caught with guile; or he may be one who must have open fight, and be fought openly. O God, we would gain souls. We would lead our neighbours to Jesus. We would instruct the ignorant, subdue the fierce, soften the hardened. Teach us how we can do it. Thou hast given zeal; O give us also wisdom. Make us wise to win souls, as well as anxious to win them.

Two parting questions to each one here present. Have you come to Jesus *yourself*; have *you* seen Him, heard Him, and received Him? That is one question. Now for the second. Have you ever gained a soul to Christ; have you gone to your neighbours with the loving—"Come, and see Jesus;" and have you brought them to Him? Ponder well over these two questions during this week. Pray over them, and answer them honestly, and to God himself.

DARWIN ON THE ORIGIN OF SPECIES.

(*Continued from page* 120.)

In our former paper on Mr. Darwin's theory of the origin of species we saw that he derives no countenance whatsoever for it from those variations, whether natural or artificial, which are to be seen in different individuals of one and the same species. We also saw that he himself acknowledges that in the geological record, so far as it is known, there is no countenance for that view of his which supposes a gradual transformation of form and organization from the lowest to the highest species. On what, then, can he rely? On an argument based solely on probability! He draws our attention to what now goes on, and what we have no doubt has always gone on upon our planet since living organisms were created on it. This process Mr. Darwin very well terms the "struggle for existence." Through this struggle he supposes that the laws acting upon the living organisms may have developed them from their very lowest to their highest forms through a process which he calls "Natural Selection." He claims to have unlimited time at command during which such supposed development has taken place. He can allow required time for each successive development, however slight. In the "struggle for existence" and the consequent "natural selection" of the individuals best fitted for life through some favourable peculiarity of which each species is capable, through its capacity of variation, he supposes that he has a natural agency at work which would produce the development of species, and so the origin of all existing species, including the highest species, man, from those lowest organisms in which our mysterious possession, life, began. We will consider his argument—we are fortunately able to do so. It requires no great scientific knowledge to enable us to judge here. We will examine whether the "struggle for existence" is calculated to produce such effects as Mr. Darwin supposes to arise from it. If it has no such effect on species as he imagines, if, on the contrary, it has, if any, a contrary effect during those periods of time of which we can take count, then the mere vastness of the periods during which Mr. Darwin supposes his developments to have taken place is of no use to him whatsoever. Circumstances which are not calculated to produce a certain effect within four thousand years, cannot be supposed to have produced that effect merely because they have had four hundred thousand years, or any number of years we may imagine, during which to work. In our remarks we will confine ourselves, for the sake of brevity, chiefly to the struggle for existence among and between species having life.

Every species has a natural and wonderful power of increasing in the numbers of its kind through reproduction. Even those species which increase in the slowest ratio would increase marvellously and rapidly if there were no checks to their increase. No matter how few in number were the original species created, still, if all lived their ordinary term of life, ere long the period must arrive when their supply of food in any given locality, or even upon the surface of the whole earth, would be insufficient to maintain them. Hence, then, must have come a time when all could not live their natural lifetime, when there must be a struggle for existence, to see which individuals would live and which must perish. This period of struggle, once arrived at, would of necessity continue so long as the conditions of existence remained unaltered (p. 75). We have no doubt that such is a correct view to take on this part of the question. Where all cannot live there must be a struggle for life. That this struggle for life is calculated to produce the development of the

higher from the lower species is what Mr. Darwin affirms and we deny.

This struggle for existence arises, according to our author, chiefly from the following grounds. First, there are large classes of animals who live by preying upon other species either in their mature or immature condition, *i.e.*, either on the egg, or the young, or the grown-up animal; consequently, of those species thus preyed upon a large proportion perish before they have reached maturity, while but a small proportion live their full natural life. Secondly, there occur at intervals dearths of food, which carry off the majority of various species, both of young and old, leaving but few survivors to perpetuate their race. Thirdly, either in connexion with such dearths of food, or from other causes, pestilences arise from time to time, and are attended with such similar results as dearths produce. Fourthly, individuals of the same species struggle with each other for existence, whether such struggle arises from the pressure of scarcity of food or other sources. All these causes wonderfully check the increase of species, allowing some individuals to live their natural period of life; while probably by far the larger number, even under favourable circumstances, perish before their term of life is ended. This struggle for existence, according to Mr. Darwin, naturally tends to develop certain qualities or organs, the possession of which, from the natural capacity of variation which every species is endowed with, has, according to his view, enabled some individuals to survive while the rest of their race has perished. Such favourable qualities or organs these survivors transmit through the principle of inheritance to their descendants. This struggle going on from age to age of incalculable periods, and at each renewed struggle naturally leaving the fittest to live, while those not so well adapted for the struggle perish, has produced all those highly-developed organisms which are now seen from organisms originally of the lowest kind. Our position is, that such a struggle, in any one or all combined of the above conditions, is not calculated to produce the development of one species into one or more distinct species of a higher order. To show this we must examine each of their conditions in detail (pp. 73-75, 79, 80).

We will first attend to the case of classes of animals which live wholly or partially by preying upon other species at various periods of their existence and growth, and thus allow only a proportion of the individuals belonging to it to reach their natural term of life. Such a process goes on throughout nature. The lion preys on the antelope and the ox, the fox upon the rabbit and hare, the falcon upon the pigeon, the magpie and the carrion crow upon the eggs and the young of other creatures, the whale upon the herring, the eel upon insects, small fry, and, it is supposed, upon the spawn of other fish.

Now, we maintain that in this entire proceeding there is no tendency whatsoever to produce a development of species by the destruction of any given number of the individuals composing it. Let us first take the case of birds preyed upon by birds or other living creatures. A very large proportion of birds are destroyed while in the shell. Magpies, crows, weasels, rats, and other animals destroy vast numbers of them in this their incipient period of life. No one will contend for a moment that these animals make a selection of any kind. They destroy indiscriminately all that they can find. The egg that might have produced the superior bird is devoured alike with that which might have produced an inferior. There is no room here for any improvement of species, far less for such development of it into another species as Mr. Darwin contends for. Of those birds which have broken the shell, again, a considerable proportion are destroyed before they are fully matured in power of flight to enable them to escape their enemies. Here, too, the magpie and the crow, with a fresh host of enemies who did not seek their life until after they had broken the shell, as cats, hawks, &c., prey upon them. These make no selection. They destroy indiscriminately all that they can find exposed to their ravages; so, again, of their destruction after they have reached a full maturity of powers. The preying species make no distinction. They do not spare the more gifted individual. We do not find in their entire process any tendency to the origination of new species. It is just the same when we come to animals of any other kind. Let us take the case of the rabbit in its warren. Of this species in all probability by much the greater proportion of its members are destroyed when very young, and quite incapable of motion. The weasel and the rat discover the hole where the mother has laid her young, and devour them indiscriminately. Sometimes, we are told, the male rabbit does the same. While they are yet young, though able to run and to feed themselves, the indiscriminate process of destruction goes on from their first enemies, aided by a new army of foes—the fox, the cat, the falcon, &c., &c.; and when they are fully grown the same indiscriminate destruction goes on. Neither fox nor dog nor weasel selects one individual rather than another, but devour whatever they can catch. In this whole process, individuals, possessing such varieties as nature undoubtedly presents at times, are just as likely to be destroyed as others. They can never on this process arrive at any such predominance in numbers as to give the tone to the species. They freely interbreed with the majority of the individuals of their species, and the varieties are lost in the common type. No succeeding generation can be shown to have the smallest likelihood of surpassing the preceding one by this war of destruction waged against it by species of other kinds.

We now come to the second source of a struggle for existence, namely, that arising from dearth of food. Mr. Darwin apparently relies upon this source of the origin of new species more than upon that which we have just considered. We believe it will be found to be at least as inefficacious.

Let us first take the case of seedling plants. On a little piece of ground, some three feet long by two wide, hundreds of plants have sprouted

where but comparatively few could survive the earliest periods of growth. Of 357 plants which had thus grown, Mr. Darwin noticed that no less than 295 were destroyed in their infancy, chiefly by slugs and insects. It is quite plain that such destruction was indiscriminate, the earlier or the sweeter growths being probably those chiefly destroyed. But even with loss of this kind too many survived for permanent life. The stronger or earlier growths killed the weaker or later, whether of their own or of other species of plants. But no one acquainted with the growth of plants will tell us that this struggle for existence, leaving some plants alive while others perished, exercised an influence of any other than an injurious kind upon the surviving plants. So far as it exercises any influence, it has only tended to check and stunt the growth of the individual plants which have survived in spite of it, but which would have been finer and healthier plants if from the first they had had free space for growth, and which have suffered in the precise ratio of the severity of the struggle.

As it is with plants, so exactly is it with animals of every kind in that struggle for existence which arises from dearth of food. Let us take, for instance, the case of the grouse species of some vast mountain tract. A dearth of food arises from any reason, so that the district can by no means sustain the number of birds it has been accustomed to maintain. It is allowed that, on the occurrence of this dearth the species presents its usual typical aspect. Varieties there may be at the time among some of its individuals, but none such as to alter materially the qualities of those individuals beyond those of the rest; such development is the thing to be produced, not the thing already produced. The varieties are yet few, and unimportant. In this state of things a dearth of food occurs. What is the first consequence? All the weakest, *i.e.*, all the young, perish first. The destruction of them is absolutely indiscriminate, because universal. Whatever varieties any of them may have possessed, the individuals so favoured perish with their less favoured brothers and sisters. But the scarcity of food affects the mature birds. It is quite plain that none of these have as yet received any such development as makes them in respect of any *organic structure* much more likely to survive than other individuals. Such organic structure is a thing, according to Mr. Darwin, of a very slow growth indeed. General hardihood of constitution is the feature here which gives the best prospect of survival. The individuals possessed of varieties being then confessedly vastly fewer in numbers than those possessed of none; and being as yet possessed of no varieties which give them much more prospect of survival than others, it is quite plain that, when the struggle for existence is over as regards the supply of food, the proportion of surviving individuals possessed of no distinguishing varieties will still predominate over those possessed of such almost as much as before the dearth occurred. But this is not all. In this dearth all individuals without exception have been reduced in point of strength. In this their reduced condition they are, none of them, able to escape from their enemies, birds of prey and others, as they were before. These destroy them indiscriminately, the varying equally with the undistinguished individuals. At the end of our dearth, then, what have we? We have a certain number of individuals surviving. Of them the larger proportion are undistinguished by any variety of species. The indiscriminate interbreeding of these distinguished and undistinguished individuals, then, will produce exactly the same type as existed before the dearth, with the exception that all the parent-birds having been more or less physically weakened by the famine, the nestlings of the next year may be of an inferior kind to the generations that went before. Dearth of food, producing great destruction of life, is yet seen to have no tendency to develop species, or produce their variety.

Let us next take the case of cattle as they rove in a wild state over vast desert prairie lands. A long drought has dried up the springs, and the pastures of the wilderness are parched and bare. The smaller streams have gradually dried up; the larger ones and the rivers alone have a supply of water. Even along the banks of these the herbage is dried up. Now it is quite plain that the first effect of this want of food, and often of water, will be to exterminate the weaker individuals, *i. e.*, all the young. We cannot imagine at this period any such possession of organic variety or superiority on the part of some individuals above others as will enable them to resist the effects of famine much, if at all, better than the rest. Whatever may be the individual variety, even Mr. Darwin does not suppose it at this time so developed in any as to enable them to live upon what would not sustain life in the ordinary condition of their species. They cannot find water where others find none, or food where others find it not. Again, in the weakened condition to which all are reduced, the strongest is almost as much a prey to their enemies as the weakest. The wolves and the bears of the desert make no selection in their prey. And thus here, as in the case previously considered, we have at the termination of the dearth a certain number of survivors among whom the proportion of individuals in any way distinguished by varieties is not perceptibly greater, if it is at all greater, than it was before the dearth commenced. Mr. Darwin's theory requires the individuals distinguished by variety to survive, while the rest perish; but we do not find that the struggle for life produced by want of food has any such effect. There are fewer individuals, but the proportion of distinguished and undistinguished individuals is just the same. The entire race may be deteriorated for a time by the dearth, but it exhibits no tendency whatever to develop into new, distinct, and superior species, in consequence of it.

Epidemics arising from climatal causes, as cold or drought, Mr. Darwin supposes to be the most effective of all checks to the redundancy of numbers in various species. Thus he calculated that in the winter of the year 1854-55 four-fifths of the birds in his own grounds had

been thus destroyed. But there is not the shadow of a reason for supposing that such destruction could operate in any way towards the development of the species. Diseases of this kind are very indiscriminate in their attacks. The strong have no exemption whatever: they are just as liable to be attacked and carried off as others. Varieties such as species present from time to time could have no effect in warding off the attack of the epidemic. And so at its close we should find the condition of the survivors to be just what the condition of the species had been before its numbers were thinned by disease. The epidemic does not tend in the slightest degree to produce Mr. Darwin's development of species.

Such are the results of the struggle for existence from whatever causes arising. It has no tendency whatever to alter or develop species. Any natural effect it would seem to have would be an unfavourable effect upon the species in general, not an elevation of its standard. The severer and the more frequent the struggle the more unfavourable the effect. And yet it is upon this struggle for existence that Mr. Darwin depends for that "Natural Selection" of the fittest individuals of each species for survival, through whom the species is to be developed into new, higher, and distinct species (pp. 6, 91). But the struggle for existence has no tendency to leave in life individuals possessed of certain varieties while it destroys individuals who had them not. There is, therefore, no ground whatever for Mr. Darwin's theory of Natural Selection. It is to no purpose that he claims periods of time beyond our powers of calculation within which to produce his development. Periods of time count for nothing when there is no power at work to produce within them the desired effect. If Mr. Darwin could show from actual observation that the struggle for existence had the smallest actual tendency to produce a development of species, then indeed the vast periods of time which he refers to would come to his assistance. Without such a tendency no more will be effected in a million of years than would be effected in a moment of time.

To our mind Mr. Darwin appears one of the most completely *theoretical* writers whom we have ever read. He draws out a theory, more or less plausible in appearance, but he does not sustain it by observation or by fact. Indeed observation and fact, even as presented to us by himself, seem quite inconsistent with his theory.

Here is his theory of Natural Selection: "It may metaphorically be said," he tells us, "that Natural Selection is daily and hourly scrutinizing, throughout the world, the slightest variations, rejecting those that are bad, preserving and adding up all that are good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life. We see nothing of these slow changes in progress until the hand of time has marked the lapse of ages, and then so imperfect is our view into long-past geological ages, that we only see that the forms of life are now different from what they formerly were" (p. 96).

We cannot help wondering that what Mr. Darwin has himself observed in nature should not have convinced him that this process of his, of which he allows that "we see nothing," is not founded upon fact. How does Mr. Darwin tell us that his process of natural selection treats "sudden and great deviations of structure, such as we occesionally see in our domestic productions"? We should suppose that such, if favourable to the species, would be exactly such as she would most closely "scrutinize," and would most care for, "preserve, and add up." But no. Mr. Darwin tells us that it "may be doubted whether such are ever permanently propagated in a state of nature" (p. 40). Natural Selection rejects great variations however beneficial, and only scrutinizes the "slightest variations"! On what principle she rejects the greater and more important and accepts the lesser and more unworthy, Mr. Darwin does not explain. To our mind it seems a great slur thrown upon Natural Selection by its high-priest. The greater the variation the more likely, to our mind, would be its preservation and perpetuation, at least in part.

But Mr. Darwin elsewhere draws our attention to a fact in natural history which seems to show that Natural Selection is just as careless of the "slightest variations," and "preserves and adds them up" with no greater interest than she does those greater variations which she always lays aside. Nature, according to Mr. Darwin's just observation, is always presenting slight varieties in species. How has Nature treated them, according to Mr. Darwin's correct and accurate observation? Treasured them up, added them together, produced within the vast ages of the past species marvellously improved beyond their rude original! Nothing of the kind. "Neither Australia," Mr. Darwin tells us, "the Cape of Good Hope, nor any other region inhabited by quite uncivilized man, *has afforded us a single plant worth culture*" (p. 40). Our author endeavours indeed to get rid of the strange bearing of this fact upon his theory by reminding us that "it has taken centuries or thousands of years to improve or modify most of our plants up to their present standard of usefulness to man." But how does this improve his case, seeing, if Nature cannot effect an equal work with man within the same period of time, she had almost unlimited time within to work? The last great glacial period occurred, according to Mr. Darwin, some 240,000 years ago. And what, within this vast period, has been effected by that natural selection which, according to our author, is "a power incessantly ready for action, and is as immeasurably superior to man's feeble efforts, as the works of nature are to those of art" (p. 73)? The answer is—nothing. For this theory of Natural Selection, then, acting through the struggle for existence, and producing from the lowest rudimentary organism the highly developed species that now exist, we contend that Mr. Darwin has no ground whatever. He cannot support it from what observation teaches of the present, or history or geology teaches of the past. Natural Selection is, from all that we can observe and judge, wholly unequal to the

mighty task which Mr. Darwin lays upon her. He has an ingenious theory but no sustaining facts. For such theories, no matter from whom they come, no matter what their professed object, we entertain no respect whatever. The grand mystery of the origin of species is not cleared up by anything Mr. Darwin has written about it in this celebrated work of his. Least of all does he account for the origin of the highest species of being, the race of man. We still abide by a much older and, we believe, a much truer account of the origin of man than Mr. Darwin has given us, the old text of Genesis relating a distinct act of creation: "The Lord God formed man out of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." We believe this to be sounder, as it certainly is a much more pleasing theory, than that which makes him the offspring of the baboon, and the brother of the dog.

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