Art. VI. — DARWIN'S ORIGIN OF SPECIES.

On the Origin of Species by Means of Natural Selection, or the Preservation of Favored Races in the Struggle for Life. By Charles Darwin, M. A., Fellow of the Royal, Geological, Linnæan, etc. Societies; Author of "Journal of Researches during H. M. S. Beagle's Voyage Round the World." London: John Murray. 1859. 12mo. pp. 502. New York: D. Appleton & Co. 1860.

The work of this eminent naturalist has attracted very general attention, both in England and in this country. It has been read with deep interest, not by men of science alone, but by all thinkers and reasoners. Nor is this to be wondered at. The author is well known as an able and careful observer. His book is the result of twenty years of patient and constant labor, and the facts, assiduously collected, are given in an attractive form, and in a spirit of unusual candor.

Had the theory which is advanced, however, been confined to an inquiry into the origin of species, we doubt whether it would have made this sensation beyond the circle of professional readers. But it adopts, or at least suggests, views on the modes of action of the Creator, and on the ways of Providence, that are repugnant to the most cherished feelings and hopes of man. We would not willingly do injustice to Mr. Darwin, or misinterpret in any, even the slightest degree, the tendency of opinions so sincerely and earnestly advocated. We shall scrupulously set forth his own words, and endeavor to draw from them no conclusions to which they do not inevitably lead.

The theory may briefly be stated thus. All organized beings "naturally increase at so high a rate, that, if not destroyed, the earth would soon be covered with the progeny of a single pair." This tendency to geometrical increase must be checked by destruction, at some period of life. From whatever cause this destruction may proceed, whether from a scarcity of food, producing competition, or from the attacks of natural enemies, there will be a great struggle for existence. Whenever any variety is accidentally furnished with better means of coming off victor in this struggle, or is, as Mr. Darwin calls it, more

favored, it will have the better chance of surviving, and of reproducing its kind. Its offspring will, by the law of transmission, inherit the same advantages; and among them, or among their descendants, some one will have them in even a more eminent degree. This individual will now enjoy the same relative superiority over its fellows as their common progenitor had enjoyed, and will, in like manner, supplant them also. This process will continue by *natural selection* until the original type is so transmuted, that it is no longer to be recognized as the same, but is regarded as a distinct species.

We shall revert to the consequences flowing from this theory, — consequences, indeed, from which Mr. Darwin does not shrink. At present, we will look at the logical basis on which it rests, with one preliminary remark. The facts adduced have not, for the most part, been controverted. The question, therefore, is taken from the exclusive domain of physical science, and may, without presumption, be discussed by any one qualified to reason from admitted premises, to a conclusion. Other views, also, may be valuable besides those of science. This question has its metaphysical and even its theological aspects. One advantage, even, the unscientific reviewer possesses. He is pledged to no pre-announced conclusions, and can study a new opinion with acknowledged impartiality.

Examined in this view, the argument is this: — 1st. The intervention of man has produced, by careful and repeated selection, remarkable changes in domestic animals, and in cultivated plants; 2d. Nature constantly produces varieties; therefore, 3d. Nature, commanding indefinite periods of time, may bring about much greater changes than man can possibly do, and so much improve and extend any accidental peculiarities, favorable to the individual possessing them, in the great struggle for life, as, by slow degrees, to alter its specific and even its higher relations.

To this reasoning we should object, in the first place, that when man undertakes to modify animals or plants in order to adapt them to his wants, he carefully selects for breed such individuals as possess the qualities that he wishes to foster, and studiously, during repeated generations, prevents the approach of all others. The more valuable the race, the more

anxiously does he guard it against any accidental corruption. Now Nature has no such means of exclusion. A perpetual crossing and intermingling goes on. Abnormal differences of form promptly disappear, and the original type of the species is preserved. It is singular that, throughout this book, a gradual divergence from this type is taken for granted; but not one instance is produced of a variety having given birth to a new variety, more remote from the primitive pattern. Yet on this assumption the whole theory rests; if it is unfounded, the entire logical basis is undermined.

In the second place, the changes produced by human agency are confined within *specific* limits; that is to say, they consist in the development of certain observed tendencies, and the repression of others; these tendencies, therefore, are not something added to the species, or subtracted from it, but were already there existing. There is no approach towards *generic* changes. The most improved Southdown ram or Ayrshire bull is but a ram or a bull after all. We are aware, that in a single instance, that of the various breeds of domestic pigeons, Mr. Darwin attempts to show that man has succeeded in effecting changes of a higher order.

"Altogether, at least a score of pigeons might be chosen, which, if shown to an ornithologist, and he were told that they were wild birds, would certainly, I think, be ranked by him as well-defined species. Moreover, I do not believe that any ornithologist would place the English carrier, the short-faced tumbler, the runt, the barb, pouter, and fantail in the same genus." — p. 27.

That his indefatigable industry could point to this one instance only of changes apparently generic, is in itself suspicious; we involuntarily ask whether it is quite certain that these birds, now so distinct, really spring from one common stock. On close scrutiny, it will be found that this belief rests on very slender evidence. The common rock-pigeon of the present day is designated as the wild representative of all the domesticated pigeons. As these birds have been favorites, by Mr. Darwin's own showing, about five thousand years, that is, since at least three thousand years B. C., any account of their parentage must be very apocryphal. Indeed, he does

not pretend to know anything about it; he only infers their origin from internal evidence, and from arguments such as these: that there are no wild rock-pigeons now extant resembling them (that there should be, after so long a lapse of time, we suppose was scarcely to have been expected); that in no climate do they revert to the feral state, — which, if it prove anything, proves too much, namely, that they are not natives of any climate; and lastly, that, when crossed, the hybrid offspring are apt to assume the plumage of the rock-pigeon.

"When two birds belonging to two distinct breeds are crossed, neither of which is blue, or has any of the above specified marks, the mongrel offspring are very apt suddenly to acquire these characters; for instance, I crossed some uniformly white fantails with some uniformly black barbs, and they produced mottled brown and black birds; these I again crossed together, and one grandchild of the pure white fantail and pure black barb was of as beautiful a blue color, with the white rump, double black wing bar, and barred and white-edged tail-feathers, as any wild rock-pigeon. We can understand these facts [*qu.* this fact?] on the well-known principle of reversion to ancestral characters, if all the domestic breeds have descended from the rock-pigeon." — pp. 29, 30.

If this were all conceded, it would not, surely, prove the descent of both the parents. A man may have a son resembling his own father, without the surmise arising that his wife is his own sister. But, after all, only one authentic case is adduced; and Mr. Darwin may be reminded that one pigeon no more proves a theory, than one swallow makes a summer.

If, then, there is no sufficient reason to believe that man can do anything more than to foster and develop existing and apparent tendencies, it cannot be inferred, by analogy, that Nature possesses the powers here claimed for her, so transcendent not merely in amount, but in kind. We say in kind; for it must not be forgotten, that we are so ignorant of the internal mysteries of organization, that we have no right to assume that genera are not distinguished from species, by differences incommensurable with those that separate one species from another.

In the third place, as this reasoning rests entirely on the

second proposition, namely, that Nature constantly produces varieties, we have a right to demand that the author should be held to strict proof of this. For it is evident that, if Nature never, or very rarely, produces varieties, no hypothesis of the gradual evolution of the complex system of organized forms out of such varieties could be even suggested. Now, it is not our intention to take upon ourselves the burden of proving the negative, but simply to suggest some reasons why we should be slow to admit as established what we are free to allow has been taken for granted by nearly all, if not by all, naturalists. This general consent is entitled to great weight. We think, notwithstanding, that it may be readily explained.

And first, as to the animal kingdom. The existence of varieties among animals is strenuously denied by the highest authority in zoölogy in this, or perhaps in any country. We gladly resign to him the task of defending his position. It should be observed, however, (and this remark applies equally to both kingdoms,) that it is not denied that discrepancies exist between individuals strictly confined within specific limits. Thus among men, one is tall, another short; one dark, another light; and, in general, there are sufficient differences to make it easy to discriminate between them. In like manner, no two leaves on the same tree present, it is said, an absolutely identical contour. But this is not what is meant by "varieties." Such a departure is meant from the normal form, as cannot fairly be included within the limits of ordinary difference, and is not due to hybridization. In practice, naturalists will not agree whether a particular specimen is or is not a variety. This is only owing to fallible judgment; the idea itself is clearly enough apprehended.

We may the more readily confine ourselves to the vegetable kingdom, because Mr. Darwin's instances of variation are drawn from it almost, if not quite exclusively. This is the more noteworthy, because the application, on the other hand, is almost equally exclusively to the animal kingdom; an application the more questionable, from the marked distinction which the presence or absence of an immaterial, or thinking, principle creates between these two great divisions of the organized creation.

It is well known, and is an elementary fact in Botany, that some genera have the organs of reproduction of both sexes in one flower, others in different flowers on the same plant, and again others have them in different plants. So long as it was taken for granted that the first, called hermaphrodite plants, were independent in their action, and in all instances self-fertilized, every departure from the usual form was necessarily a variation. But if it should appear that this is not so, but that in innumerable instances, if not generally, fertilization takes place from a different plant, either of the same or of some allied species, this necessity no longer exists, and it becomes a fair subject of inquiry whether these so-called varieties are not simply cases of hybridism. That their forms should be, in various degrees, intermediate between different species, is only analogous to our daily experience in the case of mongrel animals, where in the same litter we see one of the offspring resembling one parent, one the other, while the rest have types intermediate between the two. The question then recurs, Is there evidence that, in hermaphrodite plants, fertilization often takes place between plants of allied species? We may let Mr. Darwin answer this question: —

"I am strongly inclined to believe that with all hermaphrodites two individuals, either occasionally or habitually, concur for the reproduction of their kind." — p. 90.

"These facts incline me to believe that it is a general law of nature (utterly ignorant though we be of the meaning of the law) that no organic being self-fertilizes itself for an eternity of generations; but that a cross with another individual is occasionally — perhaps at very long intervals — indispensable." — p. 91.

He shows us also how this takes place through the instrumentality of insects: —

"It is scarcely possible that bees should fly from flower to flower, and not carry pollen from one to the other, to the great good, as I believe, of the plant. Bees will act like a camel-hair pencil, and it is quite sufficient just to touch the anther of one flower and then the stigma of another with the same brush to insure fertilization." — p. 92.

It is therefore established that hybridization may take place much more frequently than it has been heretofore suspected,

even among hermaphrodite plants, — nay, more, there are cases in which self-fertilization is impossible.

"In many cases, far from there being any aids for self-fertilization, there are special contrivances, as I could show from the writings of C. C. Sprengel and from my own observations, which effectually prevent the stigma receiving pollen from its own flower; for instance, in *Lobelia fulgens*, there is a really beautiful and elaborate contrivance, by which every one of the infinitely numerous pollen-granules are swept out of the conjoined anthers of each flower, before the stigma of that individual flower is ready to receive them; and as this flower is never visited, at least in my garden, by insects, it never sets a seed, though by placing pollen from one flower on the stigma of another, I raised plenty of seedlings; and whilst another species of Lobelia growing close by, which is visited by bees, seeds freely. In very many other cases, though there be no special mechanical contrivance to prevent the stigma of a flower receiving its own pollen, yet, as C. C. Sprengel has shown, and as I can confirm, either the anthers burst before the stigma is ready for fertilization, or the stigma is ready before the pollen of that flower is ready, so that these plants have in fact separated sexes, and must habitually be crossed. How strange are these facts! How strange that the pollen and stigmatic surface of the same flower, though placed so close together, as if for the very purpose of self-fertilization, should in so many cases be mutually useless to each other! How simply are these facts explained, on the view of an occasional cross with a distinct individual being advantageous or indispensable." — pp. 92, 93.

"Many of our orchidaceous plants absolutely require the visits of moths, to remove their pollen-masses, and thus to fertilize them. I have, also, reason to believe that humble-bees are indispensable to the fertilization of the heart's-ease (*Viola tricolor*), for other bees do not visit this flower." — p. 71.

We are aware that we subject ourselves to a charge of scientific heresy in advancing even a doubt of the existence of varieties, properly so called, in the vegetable kingdom; but as we have incurred, or at least deserved, excommunication already, we will venture a step further. If Nature, in particular instances, takes such pains to prevent self-fertilization, may not the contrary be the rule instead of the exception? Mr. Darwin says: —

"So necessary are the visits of bees to papilionaceous flowers, that I

have found, by experiments published elsewhere, that their fertility is greatly diminished if these visits be prevented." — pp. 91, 92.

Exactly the result in marriages, where the parties are too near akin in blood! Many hitherto anomalous facts would be explained by such an hypothesis as we have here ventured to suggest; such as the extreme difficulty experienced by gardeners in procuring fruit from isolated plants which yet flower freely. It would also explain what has been much insisted on to prove varieties, — namely, the abnormal forms that show themselves in plants from distant localities, cultivated in our botanic gardens, and thus secluded from the vicinity of all their congeners. Such forms would only confirm the well-known fact, that "interbreeding diminishes vigor and fertility."

Before leaving this subject, we will just advert to a very curious illustration, by Mr. Darwin, of the mutual action of plants and animals on each other: —

"From experiments which I have tried, I have found that the visits of bees, if not indispensable, are at least highly beneficial to the fertilization of our clovers; but humble-bees alone visit the common red clover (*Trifolium pratense*), as other bees cannot reach the nectar. Hence I have very little doubt, that if the whole genus of humble-bees became extinct or very rare in England, the heart's-ease and red clover would become very rare, or wholly disappear. The number of humble-bees in any district depends in a great degree on the number of field-mice, which destroy their combs and nests; and Mr. R. Newman, who has long attended to the habits of humble-bees, believes that 'more than two thirds of them are thus destroyed over all England.' Now the number of mice is largely dependent, as every one knows, on the number of cats; and Mr. Newman says, 'Near villages and small towns I have found the nests of humble-bees more numerous than elsewhere, which I attribute to the number of cats that destroy the mice.' Hence it is quite credible that the presence of a feline animal in large numbers in a district might determine, through the intervention first of mice, and then of bees, the frequency of certain flowers in that district!" — pp. 71, 72.

The author might have carried this chain of causes one step further, and said that the number of cats is largely dependent, as every one knows, on the number of old maids. Confirmation would thus be given to the pretension often advanced by themselves, that old maids live in clover!

In the fourth place, we should demur to the word *accidental* as applied to any object in nature. The very question at issue is prejudged by the use of such a term. We well know that it is often said that chance only means a cause not within our knowledge. And so it sometimes does. If we cast a die, we say that it is a chance which face will turn up. When, however, it is added, that, because God knows it beforehand, what is chance to man is design to God, there is a strange confusion of ideas between God's agency and his foreknowledge. In the matter we are considering, the explanation is certainly irrelevant; for the word is applied, not to anything as judged of by man, but to an act, original or secondary, of creation. That it was so intended is proved by the great care with which Mr. Darwin in many passages eschews — even, we regret to say, sneers at — the idea of any manifestation of design in the material universe: —

"If green woodpeckers alone had existed, and we did not know that there were many black and pied kinds, I dare say that we should have thought that the green color was a beautiful adaptation to hide this tree-frequenting bird from its enemies." — p. 176.

"If our reason leads us to admire with enthusiasm a multitude of inimitable contrivances in nature, this same reason tells us, though we easily err on both sides, that some contrivances are less perfect. Can we consider the sting of the wasp or of the bee as perfect, which, when used against many attacking animals, cannot be withdrawn, owing to the backward serratures, and so inevitably causes the death of the insect, by tearing out its viscera?" — p. 180.

This is just one of the cases that presents no difficulty to any one who believes that the assailant and the assaulted are alike the objects of God's paternal care, but is quite inexplicable upon the idea of natural selection. Surely, a bee *accidentally* born with a smooth sting would have had the best chance in the struggle for life.

We should in like manner object to the word *favorable*, as implying that some species are placed by the Creator under *unfavorable* circumstances, at least under such as might be advantageously modified; but to this idea we shall have occasion to revert in another connection.

We have hitherto confined ourselves, mainly, to a considera-

tion of the theory announced on the title-page, — the gradual conversion of varieties into species. As we have already intimated, the author carries it much further. Partly constrained by the laws of "inexorable logic," and partly led on by a self-excited zeal on a theme which he had made the study of his life, he follows out his reasoning to its extreme consequences. This he does in spite of very grave warnings encountered in his own investigations. He says himself: "It may be asked how far I extend the doctrine of the modification of species. The question is difficult to answer, because the more distinct the forms are which we may consider, by so much the arguments fall away in force." (p. 418.)

Now this is the very touchstone of truth. A very slight deviation from a straight line becomes more and more appreciable the more distant the point of comparison. It is not so viewed by Mr. Darwin; and we hope to be excused if we say that we deem his case as really a psychological curiosity. The farther he advances, the more, step by step, the ground falls away under him; yet no suspicion is awakened in his mind that he is building his house upon the sand.

We will now consider the more extended theory, namely, that as varieties by a process of natural selection become developed into species, in like manner species become genera, genera orders, and so on, until at last the whole of organic life can be traced back to a single pair, or, at most, a few pairs of original progenitors. That we have not overstated the author's theory, we shall presently prove.

One objection meets us at the threshold. It is not easy to imagine what enemies the original pair, or their descendants in their own image, could have met with to induce the necessity of this natural selection. In the course of ages, we suppose it will be said, they might people the globe, and then, through competition, the process of improvement might begin. This objection would, no doubt, be made light of by Mr. Darwin, disposing, as he does, of such indefinite periods of time. And here we would make a preliminary protest against the use of so vague a term as *indefinite*, as applied to any topic of scientific investigation, more especially, as in this instance, to time. For what is an indefinite period of time? A million

or a thousand millions of years, though long, are not *indefinite* periods. The indefinite here merges, practically, into the infinite. Now, we know some of the properties of the infinite, such as the summation of infinite series, for example; but the idea of infinity itself eludes the grasp of our intelligence, and we have no right to invoke its aid for the solution of any finite question. The impropriety of such an invocation appears from this, — that with its aid we can prove anything, even an impossibility. The paradoxes which spring from such use of it are familiar, even in the jest-books. Keep the infinitesimal calculus in its place as a mathematical process, and it works the miracles of science, — it even works out the greatest problem of all, and teaches us what things there are which we cannot learn. But the invocation of the idea of infinity in the midst of speculations on finite affairs, only works confusion. Indeed, without such invocation, it would be impossible for Mr. Darwin to explain the gradual development of so curious and exquisite a piece of mechanism as the eye, from a nerve accidentally sensitive to light. He says: —

"How a nerve comes to be sensitive to light hardly concerns us more than how life itself first originated; but I may remark, that several facts make me suspect that any sensitive nerve may be rendered sensitive to light." — p. 167.

The difficulty is this. In the oldest stratified rocks we find forms, like those of the trilobite, with a well-developed organ of vision; while the gigantic ichthyosaurus had an eye that any modern reptile might envy. It is necessary, then, to resort to times far anterior to the oldest stratified rocks. Of this Mr. Darwin is himself aware.

"We should probably," he says, "have to descend far beneath the lowest known fossiliferous stratum to discover the earlier stages by which the eye has been perfected." — p. 168.

These stratified rocks are already reasonably ancient.

"In all probability a far longer period than three hundred million years has elapsed since the latter part of the secondary period." — p. 252.

This far longer period than three hundred millions of years probably "shrinks into insignificance" compared with the enormous lapse of time since the deposit of the earliest

Silurian rocks. As to the time anterior to these necessary by Mr. Darwin's theory, he leaves us in a pleasant state of doubt, which is not wonderful in one who deals so freely with the infinite, or, as he calls it, the indefinite. He at one time speaks (p. 169) of millions on millions of years; at another he says: "Consequently, if my theory be true, it is indisputable that, before the lowest Silurian stratum was deposited, long periods elapsed, — as long as, or probably far longer than, the whole interval from the Silurian age to the present day." (p. 268.) But in the following passage he claims a time *indefinitely* longer than either.

"The whole history of the world, as at present known, although of a length quite incomprehensible to us, will hereafter be recognized as a mere fragment of time, compared with the ages which have elapsed since the first creature, the progenitor of innumerable extinct and living descendants, was created." — p. 422.

The creation is, certainly, removed back tolerably far; but we have the comfort of learning that the day of judgment is at least equally remote.

"As all the living forms of life are the lineal descendants of those which lived long before the Silurian epoch, we may feel certain that the ordinary succession by generation has never once been broken, and that no cataclysm has desolated the whole world. Hence we may look with some confidence to a secure future of equally unappreciable length." — p. 423.

If geological investigations showed a gradually ascending series of forms, with the simultaneous extinction of the lower ones, there might be some plausibility in this hypothesis, — though even then it would be difficult to explain the absence, in each and every case, of all the intermediate forms in the great record. But forms of the lowest type are as numerous now as ever. The lingula, one of the earliest shell-fish, lives at the present day in perfect harmony with the clam, which ought, on all principles of natural selection, to have superseded it. And what good, after all, is secured to any class of beings by this supposed gradual metamorphosis? As fast as any species improves, its rivals and its enemies are also improving. While nature avails itself of an *accidentally* harder proboscis

to enable the insect, now become a borer, to lay its eggs within the bark of a tree, secure from the attacks of its enemy, the insectivorous bird, that bird has been obtaining claws, to enable it to climb, and a beak, to enable it to pierce the same bark; and now, as a woodpecker, it makes precisely the same havoc among the young larvæ as it did before. After all the painful and prolonged efforts of nature, through "millions on millions" of years, the relative numbers stand exactly where they would have done had no such heroic efforts been made.

Another serious objection to this theory is, that it may legitimately be extended much farther than its author, unless it be in his final summing up, has attempted. For why stop at the limits of human vision? Why ignore the claims of the microscopic infusoria, hundreds of which may nestle on the point of a needle? Nay, after the microscope shall have reached its utmost perfection, there will be myriads of created organisms, beyond its reach, to contend for the honor of being the living representatives of our first ancestors.

If the results of a minute analysis of this theory in the merely physical view are so unsatisfactory, how much more serious are the objections against the evidently forced and painful attempt to trace the development of mind! So infinitely superior is reason to instinct, and so apparently incommensurable are their natures, that we have a fair right to demand explicit proof of their original identity. This is the more reasonable, because the recent introduction of man upon the globe would justify us in expecting to find geological evidence of the former existence of numerous forms intermediate between him and the anthropoid apes. No such evidence has ever, that we know of, been alleged. There is, however, an inherent impossibility in the simultaneous development of mind and body, that seems to us absolutely conclusive. For as all deviations from a specific type are, by this theory, accidental in the first instance, though afterwards taken advantage of by nature, the chances that such a deviation should occur in any organ, and at the same moment in the instinct by which the animal would make use of it, would, in any single instance, be exceedingly small. When, then, we fancy that a rise in the scale of being from a mollusk to a man presup-

poses an almost infinite series of such coincidences, it is not too much to say that the difficulty rises to a mathematical impossibility. Without such a simultaneous development, however, the animal could not survive. Suppose, for instance, the gills converted into lungs, while instinct still compelled a continuance under water, would not drowning ensue? Or if a quadruped, not yet furnished with wings, were suddenly inspired with the instinct of a bird, and precipitated itself from a cliff, would not the descent be hazardously rapid?

If we should concede to Mr. Darwin, what we should not do except for argument, that any such gradual transformations really take place, still it could not, on any principles of just reasoning, be denied that they must be ascribed to the intervention of some power superior in intelligence and wisdom to mere chance. This leads us to some considerations derived from natural theology, — considerations not irrelevant to this discussion, because whatever relates to the mind of man, irrespective of revelation, is within the domain of science.

We said, in the beginning of this article, that the reason of the deep interest which this book had awakened, both in England and in this country, was, that it adopts, or at least suggests, views on the modes of action of the Creator, and on the ways of Providence, that are repugnant to the most cherished feelings and hopes of man. We have also promised to prove that we have rather understated than exaggerated the opinions of the author. We proceed to justify the assertion, and to redeem the pledge.

"Nothing at first can appear more difficult to believe, than that the more complex organs and instincts should have been perfected, not by means superior to, though analogous with, human reason, but by the accumulation of innumerable slight variations, each good for the individual possessor." — p. 398.

This, we take it, is neither more nor less than a formal denial of any agency beyond that of a blind chance in the development or perfecting of the organs or instincts of created beings. True, a first cause is admitted; but it is with that sort of protest which is suggested where its agency is studiously limited to the least imaginable amount of intervention. The exist-

ence of a sustaining Providence, if not denied in terms, is at least constantly ignored. It is in vain that the apologists of this hypothesis might say that it merely attributes a different mode and time to the Divine agency,— that all the qualities subsequently appearing in their descendants must have been implanted, and remained latent, in the original pair. Such might be a refuge to which devout minds would be reluctantly driven, were they constrained by irrefragable proof, which happily they are not, to admit such a cosmogony; but it is nowhere so stated in this book, and would be, we are sure, disclaimed by the author.

The conclusions at which he arrives are thus stated by himself: —

"I believe that animals have descended from, at most, only four or five progenitors, and plants from an equal or lesser number." — p. 419.

Mortifying enough to be descended from an oyster; but Mr. Darwin is rather of the opinion that we must rest satisfied with a lichen.

"Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from some one prototype. But analogy may be a deceitful guide. Nevertheless, all living things have much in common in their chemical composition, their germinal vesicles, their cellular structure, and their laws of growth and reproduction. We see this even in so trifling a circumstance as that the same poison often similarly affects plants and animals; or that the poison secreted by the gall-fly produces monstrous growths on the wild rose or oak-tree. Therefore I should infer by analogy that probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed." — p. 419.

Be this as it may, we were all, certainly, once fishes.

"I can, indeed, hardly doubt that all vertebrate animals having true lungs have descended by ordinary generation from an ancient prototype, of which we know nothing, furnished with a floating apparatus or swim-bladder." — p. 171.

This genealogy he considers to be an ennobling one.

"When I view all beings, not as special creations, but as the lineal descendants of some few beings which lived long before the first bed of the Silurian system was deposited, they seem to me to become ennobled." — p. 423.

He is, moreover, so well satisfied with his own views, as

fondly to anticipate that they will give rise to a new system of metaphysics.

"In the distant future, I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history." — p. 423.

"Thus he reaches at last this jubilant conclusion: —

"Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is a grandeur in this view of life, with its several powers, having been originally breathed into a few forms, or into one; and that, while this planet has gone cycling on according to the fixed laws of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being evolved." — p. 424.

Such are the views propounded by Mr. Darwin. Without intending to charge him with approaching the subject with any sceptical intentions, we cannot but regret and distrust them. Who indeed are we, to dare, in the imperfection of our knowledge, to assign the bounds, or explain the modes of action, of the great First Cause? The fact of life it is given to us to know, — to compare the forms of its manifestations, — and to explain, in a limited degree, the laws by which He governs it; but the deep mystery of life itself is, for wise purposes, to us inscrutable.

For our own part, it seems to us at once more reverent, and more consonant to the feelings implanted in our nature, to believe in an ever-acting Providence, — to believe that not a sparrow falls to the ground without the Father, — to believe that all the adaptations so admirably fitted to the need or the gratification of His creatures are the direct act of the Creator. At the risk of incurring the sneer of Mr. Darwin by seeming "no more startled at a miraculous act of creation than at an ordinary birth," we confess ourselves to be as unable to explain the one as the other. As to miracles, they have never presented to our mind any metaphysical difficulty. The Power that could enact and sustain, must, in our apprehension, of necessity be equally able to suspend or alter, the laws of nature.