Rebielus.

On the Origin of Species by means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life. By CHARLES DARWIN, M.A. London: Murray, Albemarlestreet. 1859.

MR. DARWIN is an accomplished naturalist, who by his previous works, principally consisting of observations on varied aspects of Nature, has won a high place in his own class. All who have had a mgn piace in ms own class. All who have had the pleasure of conversing with him will testify to his urbanity and philosophic tone. As an observer, no one would dispute his claims—as a theorist he now comes before the public for the first time, and awaits a verdict.

The present volume is by no means one upon which a verdict can be pronounced after a short consultation. Unless the reader be well informed upon the vast number of facts to which it alludes in more or less detail, he will find himself in-volved in a literary labyrinth, from which an easy extrication is hopeless. It is a book of hard thinking and slow elaboration. "After five years' work," says the author, "I allowed myself to speculate on the subject, and drew up some short notes; these I enlarged in 1844 into a sketch of the conclusions which then seemed to me probable; from that period to the present day I have steadily pursued the same object. My work is now nearly finished; but as it will tak me two or three more years to complete it, and as my health is far from strong, I have been urged to publish this Abstract." This, then, is urged to publish this Abstract. This, then, is the preliminary abstract—and a pretty copious one too, as it consists of 490 pages; and 490 pages of the toughest material which Mr. Murray has issued from his loom this season. We shall endeavour to make an abstract of this abstract, and to lay before our readers in simple phra-seology the chief features of the theory as far as we can discern them amidst the ample folds of illustration in which they are too often shrouded.

The word species is ordinarily the simplest term in the animal kingdom. Mr. Darwin looks at the term species as one arbitrarily given, for the sake of convenience, to a set of individuals closely resembling each other, and not essentially differing from the term variety, which is given to less distinct and more fluctuating forms. For ordinary readers it may be well to explain explain that amongst naturalists a genus is founded upon some of the minor peculiarities of ana-tomical structures, such as the number, disposi-tion, or proportions of the teeth, claws, fins, &c., and usually includes several kinds. Thus the lion, tiger, leopard, and cat agree in the structure of their feet, claws, and teeth, and they belong to the genus Felis. A species is founded upon less important distinctions, such as colour, size, and proportions. Thus there are different species of ducks, of squirrels, and of monkeys varying from each other in some trivial circumstances, while those of each group agree in all their general structure. The white man and the black man are but different species of the genus homo, although Americans might aim to prove them of different genera. The great majority of naturalists, especially in Britain, have held the view that there is a reality of species in nature, and that the term is not merely arbitrary, and thus, in addition to real existence, species have also a prevailing permanence, so that the attributes and organisation which now distinguish any living species are substantially the same as those which characterised it in its creation. substantially the same; for there is a capacity in all species to accommodate themselves to a change of external circumstances, the extent of this capacity varying considerably according to the particular species. The limits of variation may, however, be defined, and no change of time or place can produce unlimited variations from the original type. Indefinite divergence either improvement or deterioration is prevented by the fatal result attending any excess beyond the defined limits. Intermixture of distinct species is precluded by individual aversion, or punished by speedy sterility in the hybrid issue. Such is a condensation of generally-received views, and such are the views which Mr. Darwin would scientifically oppose to a greater or less extent. Others, like Lamarck, and the author of the

Others, like Lamarck, and the author of the "Vestiges of Creation," have held the same enmity to what may be called orthodox naturalism; and have, in some measure, familiarised the public mind with their theories of transmutation of species and development of animals. Mr. Darwin declares that he "believes in no law of necessary development," and so far differs from these authors, while in other respects he appears to build upon their foundation. He pronounces that "the innuversity." "the innumerable species, genera, and families of organic beings with which this world is peopled, have all descended, each within its own peoples, have an usecended, each within its own class or group, from common parents, and have all been modified in the course descent." So far not so bad; but what of this? "I believe that animals have descended from at most only four or

way of passing remark, and Mr. Darwin has yet to favour us with an imaginative description of the wonderful, sole, primeval prototype! One cannot but see how deeply our author has studied Lorenz Oken, and how nearly he resembles him. Hear Oken himself: "If the organic fundamental substances consist of infusoria, so must Plants and animals are only the metamorphoses of infusoria. No organism has consequently been created of larger size than an infusorial point; whatever is larger has not been created, but developed." Was Mr. Darwin's single protype an infusorial point? Let us hope that long before his great work appears Mr. Darwin may find what he has here hinted:—"Analogy may be a deceifful guide."

Congenial to this topic is the consideration of a question largely discussed hymerolymers. of infusoria. No organism has consequently

a question largely discussed by recent naturalists, whether species have been created at one of more points of the earth's surface. The simplest view is that now accepted by many, that each species has been produced in one single region alone, and has subsequently migrated from that rea as far as its powers of migration and subsistence under past and present conditions permitted. Hence "the several species of the same genus though inhabiting the most distant quarters of the world, may originally have proceeded from the same source as they have descended from the same progenitor." Then, further comes the inquiry, whether all the individuals of the same species have descended from a single pair, or, as some authors have contended, from many individuals, simultaneously created. here we can introduce by way of reply, Mr. Darwin's distinguishing principle:—

Darwin's distinguishing principle:—
"With those organic beings," says he, "which never intercross (if such exist) the species on my theory, must have descended from a succession of improved varieties, which will never have blended with other individuals or varieties, but will have support to the succession of improved varieties, which will have support to the support of the supp

What man has done in this instance, our author conceives that Nature has done and is doing in all. His idea is, that a principle, which he names Natural Selection, has been in operation from the first, and constantly improving the animal races. Selection is a necessary check to super-abundance. The natural tendency to in-crease is wonderful:-

crease is wonderful:—
"Every organic bring naturally multiplies at so high a rate, that if not destroyed, the earth would soon be covered by the progeny of a single flow years and, at this rate, in a few thousand years, there would literally, not be standing-room for his progeny. The elephant is reckoned to be the slowest breeder of all known animals, and I have taken some pains to estimate its probable minimum rate of increase: it will be under the mark to assume that it breeds when thirty years old, and guest opin of young in this interval. If this be so, there would be alive at the end of the fifth century, fifteen million elephants descended from the first pair."

Now, in the midst of this enormous, self-

Now, in the midst of this enormous, selfnultiplying tendency, all cannot live, or live ong. There is one wide, severe struggle for long. existence; and existence for one is its extinction existence; and existence to does as extinction for another. In every species many different checks come into operation, and act at different periods of life, and during different seasons or pars A commercial man frequently and flours. years. A commercial man relevantly and ngura-tively exclaims, "The competition is so severe that I can scarcely live." This, however it may be regarded commercially, is perfectly true natu-rally. In forest, and field, and farm, in vast wildernesses, and in cultivated plains, the struggle for existence is secretly going forward. Man, unless observant, knows little of this natural warfare. If observant, he is filled with astonishment, and asks himself how the animal kingdom can survive, seeing that it is divided against itself. Man has his days of battle and his years of war, which are succeeded by peace. Animals have no peace, but enduring combat and competition for food and life. An era of peace would tition for food and life. An era of peace would be to them one of famine, and much of what is said with reference to animals has relation to vegetables. There is war in the profoundest silence of the forest—a struggle between the several kinds of trees—continuing for long cen-turies, each annually scattering its seed by the thousand. There is war between the insects that swarm at their roots and on their leaves—war between insect and insect, insects and snails. molluse and molluse, birds and beasts of preyand yet "no fear is felt; death is generally prompt; and the vigorous, the healthy, and the

prompt; and the vigorous, the heatily, and the happy survive and multiply."

It seems that all this warfare tends to a result totally different from the wars of humanity. Man summons the strongest and the most active, the keenest and the most enterprising, to his battlefield. A day at Solferino mows down the youth But the reverse is the case in animals have descended from an equal or less number. Analogy would lead me one step further,—namely, to the belief that all animals and plants have descended from some one protoof two empires.

type." Unfortunately, this creed only comes in All this is the result of the operation of the favourite principle of natural selection. It is a wonderful tendency to animal and vegetable perfection. It constantly selects all that is good, and rejects all that is bad. It works at the improvement of each organic being in relation to its organic and inorganic conditions of life.

The theory of its action is grounded on the belief that each new variety, and ultimately each new species, is produced and maintained by having ome advantage over those with which it come into competition, and the consequent extinction of less favoured forms which almost inevitably follows. As we follow out this theory through the very numerous illustrations which the author adduces, we find him constantly aiming to prove that even the more complex organs and insticts of animals have been perfected by natural accumulations of innumerable slight variations, each one good for the individual possessor. We do not know that the author's theory could be more concisely characterised than by naming it "The Law of Continuous Progress towards Natural Perfectibility."

To yield consent to such a view we have first concede these postulates of the author, to conceae these postuntes of the author,—
"That gradations in the perfection of any orgen
or instinct, which we may consider, either do
now exist, or could have existed, each good of
its kind. That all organs and instincts are, in its kind. That all organs and instincts are, in ever so slight a degree variable; and, lastly, that there is a struggle for existence, leading to the preservation of each profitable deviation of structure or instinct." Admitting these postulates, the author thinks we must further admit his account of the structure of the structure of the structure of the structure. Of some the old destrine Natural Selection. Of course the old doctrine of the mutability of species is at the base of the new theory. The most eminent living naturalists and geologists have rejected the theory of muta-bility; and perhaps on this account there is a popular repugnance to admit that one species has given birth to another, and a distinct species. Most persons are satisfied with the generally-accented oninions that each species has been accepted opinions that each species accepted opinions that each species has been independently ereated. Before we refer to the long past in relation to Mr. Darwin's theory, let us glance at the future. It is easy to see at what conclusions he must arrive; and he does

what conclusions he must arrive; and he does not shun to hint at them: "..."

"Not one living species will transmit its unaltered likeness to a distant faturity; and of the species now living very few of any kind to a far distant faturity. For the manner in which all organic beings are grouped shows that the greater number of species of each genus, and all the species of many genera have left no descendants, but have become utterly extinct We can so far take a prospective glanee into futurity We can so far take a prospective glanee into futurity the objective properties of many genera have the no descendants, but have beenom utterfly extinct. We can so far take a prospective glance into futurity spread species belonging to the larger and dominant groups, which will ultimately prevail and procreate new and dominant species. As all Natural Selections works solely by and for the good of each being, all propress towards perfection.

And now for a glance at the past. It is here that the author's great strength or weak-new selections.

And now for a giance at the past. It is here that the author's great strength or weakness must lie. On his theory of natural selection "an interminable number of intermediate forms must have existed, linking together all the species in each group by gradations as fine as our present varieties," so the author himself admits, and expects to be asked two questions,—1. "Why do we not see these linking forms all around us?" and 2. "On this doctrine of the extermination of an infinitude of connecting-links between the living and extinct inhabitants of the world, and at each successive period between the extinct and still successive period between the extinct and still older species, why is not every geological formation charged with such links?" He speedily disposes of the first question. If we push his idea to an extreme, and say, "From your view lidea to an extreme, and large with his programmer. we might expect to see all organic beings around us blended together in an inextricable chaos." He replies, "We have no right to expect (excepting in rare cases) to discover directly connecting-links between existing forms, but only between each and some extinct and supplement form. only a few species, as we have reason to believe, are undergoing change at any one period; and all changes are slowly effected." That is to say, we presume, in the simplest words, we cannot at one period, such as the present, cast our eye over time enough, space enough, or animals and vegetables enough to form a fair opinion. Be it so, but we can do all these when we interrogate the past; and this brings us to the second question.

In the geological field we have ample time, time that transcends our conception—time that seems to shade off into a retrospective eternity. And there we have space enough. Probably the reader does not know how much, and therefore we will state that one of the geologists superintending the National Geological Survey, has recently given the following estimate of the structure of the British formations, founded upon actual measurements of the maximum thickness in most instances. The result is that we have,

Secondary strata Tertiary strata 13,190 2,240making altogether 72,584 feet; that is, very nearly thirteen and three-quarters British miles of thickness. Surely in these nearly fourteen miles of rocks and formations if present altogether we shall find very numerous remains of the desired links, and plain evidences of the grada-tion and mutation of the forms of life. We We

have from the time (now some years since) we

first heard of the preparation of this work, anticipated that this would be the experimentum erucis, and could not divine how Mr. Darwin would meet the well-known difficulty. He has met it in the most manly way by saying what he is too good a geologist to be ignorant of :- " We is too good a geologist to be ignorant or:—" We meet with no such evidence, and this is the most obvious and foreible of the many objections which may be urged against my theory." In truth, not only is there no such evidence, but there is positive and incontestable evidence against his th from the geological record; at least so we think In certain formations whole groups of species appear suddenly and abruptly. All who have searched the formations know this, and the scientific books record the names. Every geo-logist can from his own cabinet take out the logist can from his own cabinet take out the drawers which shall contain the newly appearing species in the strati-graphical arrangement. Supposing that fact could by any means be ex-plained away, there is this other fact,—numbers of species of the same group suddenly appear in the lowest known fossiliferous rocks. Here, for example, and it is perhaps the most apposite one, are now lying before us a number of fossils, which we have ourselves collected from the lower Silurian strata. These are trilobites, the living creatures having been crustaceans of a very peculiar order, now extinct, but the most abundant, and nearly the earliest—perhaps the earliest of known fossil animals. Eight or ten of them are within our reach. Hundreds of fragments were in the rocks whence we extracted them. There they first appear, and there crustaceans first appear. Search foreign Silurian strata, and similar trilobites appear in them. Here are half-a-dozen from Bohemia, there three or four half-a-dozen from Bohemna, there three or four from Russia. In no country, in no case, have they been found lower down. What is the inevitable conclusion? That the various species of trilobites were first created in the lower Silurian era. An ordinary reasoner must arrive at this conclusion, unless he has a theory to support, in which event he might repeat Mr. to support, in what event is might repeat air. Darwin, who remarks:—"I cannot doubt that all Silurian trilobites have descended from some one crustacean, which must have lived long before the Silurian age, and which probably different events from each transfer. differed greatly from any known animal

Upon theological grounds we should differ from Mr. Darwin, though we should not stigmatise his theory as some timid or stereotyped thinkers might. It lies open, indeed, to some of the anathemas launched against the author of "The Vestiges of Creation;" but we rather dissent from Mr. Darwin in a less pronounced form. We give him credit for religious feeling

dissent from Mr. Darwin in a less pronounces form. We give him credit for religious feeling when he observes:—
"To my mind it accords better with what we know of the laws impressed on matter by the Creator that he production and extinction of the past and presen inhabitants should have been due to secondary causes like those detormining the birth and death of the in executions, but as the lineal descendants of some fer-brings which lived longs before the first bed of the Silurian system was deposited, they seem to become emobiled."

The beings may, but does the Creator seem to become ennobled? Do you ennoble Him "in whom we live and move and have our being" by postponing His creative acts and energies to an indefinitely remote and humanly inconceivable era? Do you ennoble Him by constituting the whole animal kingdom—the entire organic kingwhole animal kingdom—the entire organic king-dom—a self-developing, a self-ameliorating, a self-perfecting system of life? Do you canoble Him by estranging Him from the "laws im-pressed upon matter? Do you not canoble that intangible conception Law, rather than the Law-giver? We think you do; and although we by no means fear that the acceptance of this or any other such theory would invalidate religion or revelation, yet we feel persuaded that it would bring no honour and no confirmation to either.

As a book of facts, brought together from the wide circle of natural science, we have no hesita-tion in giving the volume our heartiest commen-dation. Any reader of intelligence will be endation. Any reader of intelligence will be en-tertained and instructed by its pages. It is in this respect a marked contrast to some hasty and crude productions of the press. Take such a volume as this into the country, or retain it for wet days at home, and no passing hour would hang heavily. We trust that the present article hang heavily. We trust that the present article may serve as an introduction to it, and with this intention we have stated Mr. Darwin's ferent pages and parts of his work. We should be rejoiced to find our young men and our younger ministers informing themselves upon such topics, and qualifying themselves to pronounce opinions upon the most interesting and instructive questions arising out of the philoso-phic observations of the great and wonderful works of Him who has not opened the grand and instructive Volume of Creation merely that it may be perused by a few students and exceptional philosophers, but that it may be read even by philosophers, but that it may be read even by those who run as they read, even by the way-faring man, the busy tradesman, the intelligent youth, and especially by those whom He has counted faithful, putting them into the ministry, and who are unjust to the honour of their high calling if they continue strangers to Natural Science, and have no pleasure in seeking out the wonderful works of God.