

turb these sensitive animals) watching the habits and mode of being of the lowly deaf, dumb, and blind worm. Henceforth, few of us who have read this extraordinary work will not turn aside, like St. Francis of Assisi of old, to avoid crushing even a humble worm.

It is certainly somewhat surprising that Dr. Darwin has not mentioned in his work the only known but mortal enemy of the worm, the slug, which sucks him up and destroys annually an astonishing number. The reviewer having recently placed several earth worms in a plate covered with earth and placed under a glass bell, was able to observe the astonishing dread which the large worms felt in the presence of a single slug, who, however, passed unnoticed by the younger ones. It would seem that the little animals had no innate dread of their enemy, and that the fear manifested by their elders was the result of experience. The fact remains that the large worms expressed such terror of the slug as to speedily abandon the earth on which that obnoxious animal was placed and hide themselves under another mound removed from the presence of their enemy, who, on being transferred thither, was greeted by an immediate exodus on the part of the old worms to fresh fields and pastures new and in a safer part of the plate. Not so the little ones, they did not hesitate to creep even over the slugs, who, however, taught them the lessons of experience by seizing upon them and speedily devouring them.

\* The Formation of Vegetable Mould through the Action of Worms, with Observations on their Habits. By Charles Darwin, LL.D., F.R.S. London: John Murray.

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Dec. 15<sup>th</sup> 1859

## DARWIN'S ORIGIN OF SPECIES.

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. John Murray.

It is with no intention of offering a positive opinion with regard to the truth of the theory which it unfolds, that we are about to direct the attention of our readers to one of the most remarkable works that has appeared during the present century. The discussion of abstruse scientific questions is neither compatible with the limits nor consistent with the character of a daily journal; and moreover there are few living men whose acquisitions qualify them to enter the lists with Mr. Darwin, or justify them in listening, otherwise than with respectful deference, to the opinions to which he has been guided by careful reasoning, based upon extensive observation, and assisted by all the aid that could be derived from the study of the results arrived at by his learned predecessors in the cultivation of the same branch of natural science. The accuracy of his conclusions can only be tested by laborious and conscientious researches, undertaken in a candid spirit, and inspired by no other motive than an honest desire for the discovery of truth. It may, perhaps, be questionable whether man will ever be able, in this life, to penetrate the veil which now shrouds the history of creation, but at any rate it is certain that the present state of human knowledge on the subject is such as to render dogmatism with regard to it nothing less than conceited folly. It is precisely because it is entirely free from this blemish, which could co-exist only with extreme ignorance or excessive vanity, that we welcome this work as a most valuable aid to reflection, and earnestly bespeak for it that impartial consideration to which the learning and experience of its author, and the admirably philosophic and reverential spirit in which he has embodied the fruits of his labours, give him an indefeasible claim.

An apparent similarity in the results at which they arrive may possibly induce some to regard this book as identical in character with the "Vestiges of Creation," which a few years since created so much excitement among the general public, and aroused such a storm of indignant protestation in the scientific world: but such an impression would involve a

gross injustice to Mr. Darwin, for the difference between the two works is as great as between night and day. The author of the "Vestiges," whoever he may have been, was evidently a magnified edition of an individual whose scientific studies have been limited to attending some courses of lectures at a Mechanics' Institute. With enough of surface familiarity with the various branches of natural science to dazzle the multitude, and invest himself, in the eyes of the uninitiated, with all the qualifications of a competent teacher, he was yet so destitute of profound acquaintance with any one of them that his blunders in the discussion of points bearing upon each were at once detected and exposed by those who had specially devoted themselves to its investigation. Mr. Darwin, on the contrary, has abundantly earned, by his past labours, the high reputation which he enjoys as a practical naturalist, and, on all questions appertaining to his chosen pursuits, is recognised as an authority by the whole scientific world. Not less considerable than the disparity between the qualifications of the two writers is the difference between the character of the theories which they respectively maintain. The doctrine of the author of the "Vestiges" appears to be that a particular race of animals went on, year after year, reproducing its own kind, until at last a single pair gave birth to something essentially differing from its progenitors, the new species thus generated following the example of its predecessors; and so on, *ad infinitum*. But he does not pretend to explain the causes of these successive changes. The author of the "Origin of Species," on the other hand, while advocating a similar progressive modification of species, attributes it to the operation of a definite and persistent law, which he succinctly states, and the action of which he endeavours to illustrate by analogies, derived from actual experience. It is obvious, therefore, that there is a wide distinction between the scientific authority which belongs to these two books; and the seeming priority of the author of the "Vestiges" in presenting, though in a very rude and unsatisfactory form, a somewhat similar notion concerning the development of new forms of animal life, is, after all, illusory, since Mr. Darwin's elucidation of the views which he now propounds was in a sufficiently advanced state to be submitted to Dr. Hooker and Sir Charles Lyell in 1844, the year in which that work appeared.

As an illustration of the diversified varieties, many of them possessing such strongly marked separate characteristics that any naturalist who saw them for the first time, having no knowledge of their history, would not hesitate for a moment to classify them as distinct species, Mr. Darwin refers to the various animals and birds which have been trained in a domesticated state by careful breeders, who, by selecting and pairing the individuals possessing the peculiarities which they desire to perpetuate, and still further to develop, succeed in producing, in course of time, a specimen having few features in common with the original parent. Under this head he remarks:—

"The great power of this principle of selection is not hypothetical. It is certain that several of our eminent breeders have, even within a single lifetime, modified to a large extent some breeds of cattle and sheep. In order fully to realise what they have done it is almost necessary to read several of the many treatises devoted to this subject, and to inspect the animals. Breeders habitually speak of an animal's organization as something quite plastic, which they can model almost as they please. If I had space I could quote numerous passages to this effect from highly competent authorities. Youatt, who was probably better acquainted with the works of agriculturists than almost any other individual, and who was himself a very good judge of an animal, speaks of the principle of selection as 'that which enables the agriculturist, not only to modify the character of his flock, but to change it altogether. It is the magician's wand, by means of which he may summon into life whatever form and mould he pleases.' Lord Somerville, speaking of what breeders have done for sheep, says:—'It would seem as if they had chalked out upon a wall a form perfect in itself, and then had given it existence.' That most skilful breeder, Sir John Sebright, used to say with respect to pigeons, that 'he would produce any given feather in three years, but it would take him six years to obtain head and beak.' In Saxony, the importance of the principle of selection with regard to merino sheep is so fully recognised, that men follow it as a trade. The sheep are placed on a table and are studied, like a picture by a connoisseur. This is done three times at intervals of months, and the sheep are each time marked and classed so that the best may ultimately be selected for breeding.

The same rule applies to vegetable productions, new varieties, both of flowers and of fruits,

being constantly produced by the crossing of well selected specimens, possessing the characteristics which it is deemed desirable to preserve. In all these instances, however, the agency of man intervenes, and the examples cited are therefore valuable only as illustrations; but Mr. Darwin then passes to the consideration of the state of things which exists under the exclusive dominion of nature, and, after showing that distinct varieties are to be met with in most existing species, he proceeds to explain the agency by which he supposes that these varieties ultimately become predominant over the original species:—

It may be asked how it is that varieties, which I have called incipient species, become ultimately converted into good and distinct species, which in most cases obviously differ from each other far more than do the varieties of the same species? How do those groups of species, which constitute what are called distinct genera, and which differ from each other more than do the species of the same genus, arise? All these results, as we shall more fully see in the next chapter, follow inevitably from the struggle for life. Owing to this struggle, any variation, however slight, and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relations to other organic beings and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring. The offspring, also, will thus have a better chance of surviving, for of the many individuals of any species which are periodically born, but a small number can survive. I have called this principle, by which each slight variation, if useful, is preserved by the term of natural selection, in order to mark its relation to man's power of selection. We have seen that man, by selection, can certainly produce great results, and can adapt organic beings to his own uses, through the accumulation of slight but useful variations given to him by the hand of Nature. But natural selection, as we shall hereafter see, 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.

It will be seen, then, that Mr. Darwin holds that the functions which are discharged by man, as a discriminating breeder of domesticated animals, are fulfilled, under the rule of nature, by death. Both animal and vegetable reproduction progress at so stupendous a rate that, of the new beings incessantly generated, it is impossible that more than a certain proportion should survive; hence one race is continually preying upon another, and all created beings are waging among themselves an incessant struggle for existence, in which the weakest are necessarily vanquished, and inferiority leads inevitably to extinction. Hence he argues that every variety to which a species may give rise which is better adapted than its parent to surrounding circumstances, will on that account survive, and transmit its peculiarities to its offspring; which, again, may be similarly supplanted in turn by its own progeny; and to this continuous process of modification and development, going on uninterruptedly during countless ages, he attributes the existence of the myriad diversified forms of animal and vegetable life by which we are now surrounded. It must be confessed that he has brought to the support of his views a great number of curious facts, and seeks to enforce his doctrine by much close and careful reasoning. Moreover, it is to be observed that his present work is but an abstract of a more extensive one which he is now engaged in preparing which will embody in full detail much which is now presented in a summarised form, and it will be only just that the public should suspend even that imperfect judgment upon his theory which is all that is possible in the present state of human knowledge, until the data upon which he has based his conclusions are submitted in all their completeness. We can readily foresee the grave objections which will be urged against his teaching, and we must frankly own that many of these have a weight which it would seem difficult to exaggerate, and oppose, apparently, insuperable obstacles to the reception of his system. But, if the problem of the history of creation is ever to be solved by man on this side of the grave, this end can be attained by painstaking research and fair discussion, and we fervently hope that the undoubtedly honest but groundless fears of well-meaning, but short-sighted Christians, who look with dread upon science as an enemy striving to undermine the authority of revelation, will not lead to the infusion into the controversy of an element of bigoted rancour, which too often intrudes itself into such discussions. If, as we presume from some passages in his book, Mr. Darwin holds that the human race owes its existence to the operation of this law of natural selection, we



cannot hesitate for a moment to reject a theory which is wholly irreconcilable with the knowledge which we hold from an infinitely higher source than human research, and clashes irremediably with truths which rest upon a basis which no scientific deductions can undermine, for man does but give a striking demonstration of the fallibility of his own intellect when he strives to show that the works of the great Author of the universe stand in contradiction to the teaching which he has conveyed to us through the medium of inspiration. But this doctrine, if it be indeed held by Mr. Darwin, which we only judge to be the case from some incidental allusions, and from the absence of any direct repudiation of an inference which would naturally arise in the minds of his readers, is by no means a necessary element in his system. On the contrary, the entirely exceptional character of man, in a physical and intellectual point of view, would suffice, wholly apart from theological considerations, to indicate that his origin is totally distinct from that of the rest of animated creation. Setting aside this application of his law, the untenable character of which we trust he will be led to perceive on more mature reflection, if he really intends to teach it, the scriptural objections which may be raised against Mr. Darwin's theory appear to us to have no greater weight than those which have been so often urged against successive developments of astronomical and geological discovery, and at last abandoned perforce by the timorous cavillers, who have in the end recognised the groundlessness of their fears that the exposition of the fallacy of ancient interpretations of the text would tend to weaken the authority of revelation. Nor is there any validity in the supposition, which may arise in some minds, that the substitution of the regular operation of a fixed law for successive acts of creation derogates from the dignity of the creator; far from this, the attribution of the institution of such a law, operating persistently through countless ages, and perpetually evolving new forms of beauty, advancing nearer at each step towards perfection, assuredly involves the most sublime conception of the wisdom and power of the Almighty. We frankly own that we are very far from being convinced by Mr. Darwin's reasoning, but we cannot deny that he has made out a stronger case than we had anticipated could have been urged in support of his views, and we shall look forward with anxious anticipation to the reply which may be expected from rational scientific men, who dissent from his conclusions, and whose special acquirements qualify them for the task of breaking a lance with so redoubtable an antagonist. Whatever may be the issue of the controversy—if it should ever have an issue in this world, which we are inclined to regard as extremely doubtful—the public will still owe a heavy debt of gratitude to the accomplished author of the "Origin of Species" for having enabled them to enrich their libraries with a work replete with the fruits of profound study and wide research, conveyed in so charming a style that, while the student will prize it as a precious text-book, the most unscientific reader may peruse it with profit and delight.

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THE HISTORY OF THE  
CITY OF LONDON  
FROM THE FOUNDATION  
TO THE PRESENT  
BY  
JOHN STOW.  
1618.