

Royal Institution Museums, and pointed out a means by which they might possibly be preserved sufficiently for scientific purposes.

A paper was then read, of which the following is an abstract:—

## ON DARWIN'S THEORY OF THE "ORIGIN OF SPECIES."

BY THE REV. H. H. HIGGINS, M.A., PRESIDENT.

Mr. HIGGINS, in his introductory remarks, stated that it had been his intention to submit to the society an original paper on Mr. Darwin's book; but on reflecting that such a course would lead only to the addition of another review to the numbers which had already appeared, treating the subject more fully and more ably than he himself could hope to do, he had resolved to found his observations on the criticisms contained in the various serials in which Mr. Darwin's work had been reviewed. Some of the best of these he had not yet had time to examine; his remarks would, therefore, necessarily be very incomplete.

He considered the paper by M. Agassiz, inserted in the *Annals and Magazine of Natural History*, to be quite unworthy of so distinguished a naturalist. Having entered at some length into his reasons for holding this opinion, he said:—A singular argument is used by M. Agassiz to show that affinities between animals are not evidences of genealogical relationship. Similarity, he argues, between adult animals, is but an agreement in a single stage, and, if agreement in a single stage be sufficient to prove genealogical relationship, then, since the embryos of very distinct animals are much alike, there must be close relationship between these very distinct animals; a

*reductio ad absurdum*. M. Agassiz thus writes:—"A young snake resembles a young turtle or a young bird more than any two species of snakes resemble one another, and yet they go on reproducing their kinds, and nothing but their kinds; so that no degree of affinity, however close, can in the present state of our science, be urged as exhibiting any evidence of community of descent." A child might reply, if a young snake is more like a young bird than one old snake is like another, a young snake is not so like a young bird as it is to another young snake; so affinity, after all, is right in its indications. But this would be to concede to M. Agassiz far too much. Does an embryo snake resemble an embryo bird more than two kinds of snakes resemble each other? Differences of embryos must surely be compared amongst themselves, and not with the distinctions subsisting between adults.

M. Agassiz suggests:—"Would the supporters of the fanciful theories, lately propounded, only extend their studies a little beyond the range of domesticated animals; would they investigate the alternate generation of the Acalephs, the extraordinary modes of development of the Helminth, the reproduction of the Salpæ, &c., they would soon learn that there are in the world far more astonishing phenomena, strictly circumscribed between the limits of unvarying species, than the slight differences produced by the intervention of man amongst domesticated animals, and perhaps cease to be so confident as they seem to be, that these differences are trustworthy indications of the variability of species." It is, no doubt, desirable that Mr. Darwin and his supporters should not remain in ignorance of the "astonishing phenomena" connected with the transformations of the Salpæ, Medusæ, &c., though it is not clear why these changes should be more astonishing, *except to those to whom they may be novelties*, than the transformations undergone by insects; but, in the matter of the argument, the illustration given by M. Agassiz

is altogether wide of the mark, for the simple reason that the transformations of the Medusæ are not varieties at all, any more than the caterpillar is a variety of the butterfly. \*

Mr. Higgins then quoted some passages from a paper in the *National Review*, in defence of Mr. Darwin's theory. He also gave an outline of an article by Mr. W. Hopkins in *Fraser's Magazine*, for June and July, 1860, which he thought to be, on the whole, the best and most philosophical review of the subject he had seen. The following is an extract from it:—"At what period of his progressive improvement did man acquire the spiritual part of his being, endowed with the awful attribute of immortality? Was it an accidental variety seized upon by the power of natural selection and made permanent? Is the step from the finite to the infinite to be regarded as one of the indefinitely small steps in man's continuous progress of development, and effected by the operation of ordinary natural causes? We can scarcely suggest these questions without an apprehension of their being deemed irre-

\* Since writing the above, I have had the advantage of hearing Dr. Collingwood read an able and interesting paper in defence of M. Agassiz's criticism. On further consideration, my first impressions are, however, confirmed. The greater the eminence of the writer, the more deeply it is to be regretted that he should adopt the tone of M. Agassiz, who thus characterizes Mr. Darwin's work:—"Instead of facts, we are treated with marvellous bear, cuckoo, and other stories. *Credat Judæus Apella!*" No mere vulgar rallery could be half so offensive as the following:—"I apprehend that the meaning of the words he (Mr. Darwin) uses has misled him into the belief that he had found the clue to phenomena, which he does not even seem correctly to understand." The charge of materialism against Mr. Darwin's work I have elsewhere attempted to meet. Such an assertion as "the powers to which Darwin refers the origin of species can design nothing," was not to be expected from M. Agassiz. Whatever, on any physiological hypothesis, may be the differences or resemblances subsisting between embryos, to say that adults differ more than embryos, and to attempt to found on this observation a scientific proposition, appears to me to be as unphilosophical as anything that can well be conceived. The transformation of Acalephs are not, it is true, strictly analogous with those of insects, because the transformations of the former animals are complicated with the process of reproduction by division, peculiar to lowest forms of life. In both insects and Acalephs, however, the transformations are strictly confined to a limited cycle, and such transformations have, therefore, not even the remotest analogy with the "variations" of which Mr. Darwin writes. I do not pass on to notice other points, because it was not my object in writing to censure M. Agassiz's criticism, but only to express an opinion on his and other reviews of Mr. Darwin's theory.

verent. But they force themselves irresistibly upon us in considering these theories in regard to their legitimate and almost necessary extension to man. The difficulty of passing, according to any theory of development, from the finite to the infinite, from the mortal to the immortal, cannot be avoided by any advocate of such theories, except by denying the immortality of man or admitting that of a sponge or a polyp."

Mr. Higgins, after noticing several other articles, referred to one appearing in the *Annals and Magazine of Natural History*, for February, 1860, and continued as follows :

The reviewer asserts "it is quite evident that there is an idea involved by naturalists in the term species, which is altogether distinct from the fact of mere outward resemblance, namely, the notion of blood-relationship, acquired by all the animals composing the species through a direct line of descent from a common ancestor." Therefore, the reviewer argues "it is no sign of metaphysical clearness, when Mr. Darwin refuses to admit any kind of difference between genera, species, and varieties, except one of degree." I do not think the idea of blood-relationship is necessarily involved in the term species, unless we go so far as to assume that all species have respectively sprung from a single pair. Most naturalists would probably agree with M. Agassiz, that, on the first appearance of a species, many pairs were created, though an exception may be made in the case of man. Now, between the many pairs of the same species simultaneously created, we do not see how blood-relationship can be assigned; the location of their descendants in a species has been founded on their nearly perfect resemblance to each other; other groups, having less perfect resemblance, together with them, form a genus; the distinction is, therefore, one of degree only. The reviewer continues,—"To our mind, indeed, the whole theory of natural selection is far too utilitarian;" and

he instances the difficulty of conceiving the exquisite varieties of pattern on the wings of many insects to be the result of natural selection founded on advantageous differentiation. This is a view of the subject in which I heartily concur. Many insects are very variable in their colouring; the common currant-bush moth for example; yet, from the number of intermediate specimens, there is reason to believe the extreme varieties breed freely together. Distinctions between other species are founded on the most minute differences in the pattern; amongst these no intermediate forms are found, and there is reason to believe that, though hardly distinguishable from each other, the individuals of such closely allied species, differing only in a speck of colour, never breed together. Now, according to Mr. Darwin's theory, these closely allied species diverged from a common point, in starting from which their differences were even less than at present, and so a fraction of a speck of colour is supposed to have given them the victory in the battle of life, to have prevailed to the extinction of intermediate forms, and to have set them so far asunder that they never breed together. I can, therefore, fully enter into the difficulty urged by the reviewer, founded on the altogether utilitarian basis of the theory of natural selection. But I cannot agree with him when he points to the exquisite beauty of the wings of insects, and asserts that no such surpassing loveliness could have arisen from natural causes. What are natural causes, after all, but the instruments used by the Omnipotent mind—the very chisel and the paint-brush of the infinite artist? A flower is, in every particle, the expression of a thought entertained in the creative mind before the plant was brought into existence. Is it less so because, instead of calling the herb into life and beauty instantaneously, the Creator sets in motion agencies which produce the result only after the lapse of thousands of ages? I do not say this has been His method, but only that I see in it

nothing unworthy of Him. When, therefore, the reviewer speaks of Nature as a "pestilent abstraction," he seems to me to use intemperate language: Nature is but the expression of a portion of the Creator's mind. We need some word to indicate that wondrous train of causes and effects between which we, by investigation, are able to discover some connexion. Nevertheless, it has been the fate of every attempt to advance this kind of investigation to meet with the charge of impiety. It may be worth while to examine the condition of mind implied in an author who speaks of Nature as a pestilent abstraction. How Nature can be an abstraction at all it is hard to see. Man may succeed in representing the Creator as an abstraction; and it is quite possible that, identifying Him with qualities repugnant to all that we know of Him, the false notions of some respecting Him may be little else than a pestilent abstraction; but how in Nature, made and upheld by Him who is wisdom and power, and who names himself by a still more touching attribute; how in all Nature, from the universe to an atom, there can be anything deserving to be called a pestilent abstraction, may be plain to the reviewer, but we may, perhaps, hesitate in considering such perspicacity a valuable qualification for a writer on Natural History. The review before us is not, however, characterized by anything like general unfairness. There is a want of strict logical accuracy in many passages; but others are written in good feeling and apparent candour, as an instance of which I may, in conclusion, quote the reviewer's estimate of the value of Mr. Darwin's theory. "There is a reasonableness about it which commands our respect. It enables us to account for many a trifling variation which, because permanent, naturalists have usually regarded as of necessity aboriginally distinct, and smooths down some of the minor controversies concerning the value of minute modifications, which may properly be referred to direct agencies from without. Indeed, we will go a step

The PRESIDENT said he hoped Dr. Collingwood would favour the society with a defence of Agassiz' remarks,—which the latter promised to do.

Mr. MORTON remarked that the lines formerly regarded as separating geological systems were gradually becoming more and more indistinct, as the result of increasing knowledge. In the British strata, the close of the Cretaceous system marks the most important break. The Permian rocks seem to pass insensibly upward into the Trias, though the absence of organic remains excludes any definite conclusion. With regard to all the other systems, there is certainly a gradual change in the prevailing species, so that although in some cases species appear to have been suddenly introduced, the general inference is, that the introduction of new species was very gradual. Hence, the difficulty geologists now find in deciding the limits of systems.

In reply to a remark that few scientific men of eminence had given a distinct opinion of Darwin's work, Dr. COLLINGWOOD read an extract from the address of Sir Charles Lyell to the Geological Section of the British Association at Aberdeen, in which he spoke of Darwin's theory as throwing a flood of light upon many groups of phenomena which had not hitherto been attempted to be explained. He also exhibited specimens of *Lingula* from the Lower Silurian rocks, and recent *Lingulæ* from the modern seas, remarking that that Mollusk was a living testimony against Darwin's theory, inasmuch as it could hardly be conceived that, if natural selection had been at work for the countless ages which had passed between the lowest fossiliferous periods and the present, the *Lingula* should have profited so little by it as not merely to be *not* developed into some higher form, but to remain a *Lingula* in no respect superior to its Silurian ancestors.

Mr. DUCKWORTH observed that starfishes were found in the Upper Silurian that exhibited no perceptible marks of difference from those existing in the present day.

The Rev. J. ROBERTS deprecated the *odium theologicum* being cast upon the subject. He was glad to hear the President concurred with him, for he conceived that either theory was equally compatible with the reverence due to the Almighty.

further and affirm there is no reason why varieties, strictly so called, though too often, we fear, mistaken for species, and also geographical sub-species, may not be gradually brought about by this process of natural selection; but this unfortunately expresses the limits between which we can imagine the law to operate, and which any evidence, fairly deduced from facts, would seem to justify. It is Mr. Darwin's fault that he presses his theory too far."

Mr. Higgins expressed his intention of resuming the subject at a future meeting of the society.

Dr. COLLINGWOOD said that he could scarcely coincide with Mr. Higgins' estimate of Agassiz' criticism, which to him, appeared the most damaging and the most conclusive one which had yet appeared. Twelve months ago, when Agassiz' "Essay on Classification" was under discussion in that room, he (Dr. Collingwood) had expressed his opinion that it would be highly useful in counteracting the impression likely to be produced by the forthcoming work of Mr. Darwin, whose views he had heard expounded at their first announcement before the Linnæan Society. Having since read the book, and the reviews upon it, and heard discussions among able men upon its merits, he had formed an opinion, and not a hasty one, for during the past twelve months it had undergone more than one phase of doubt. That opinion was not favourable to its stability or general application. The arguments of Darwin were specious, and urged with so much earnestness and evidence of his own belief in their validity, that they were liable to carry away the reader at first, until consideration and cooler judgment came to his assistance. He (Dr. Collingwood) had intended to have entered upon the subject this evening, but, having been unprepared for so unfavourable a criticism upon the remarks of Agassiz as they had just heard, he did not feel willing to enter upon his defence at once, but wished more carefully to read his statements, and more deliberately to weigh them, and to have the advantage of placing his own thoughts in writing. He regarded, however, the works of Agassiz and Darwin as entirely antagonistic; and considered that the idea of a *species*, as given by the former, who considered it a life-history, embracing all the individuals composing it, their habits and economy, was a noble one, contrasting most favourably with the Darwinian hypothesis of *transmutation*, for such it was, although his supporters disliked the name.