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ORDINARY MEETING.*

THE PRESIDENT, SIR G. GABRIEL STOKES, BART., M.P., P.R.S., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following Election was announced :—

ASSOCIATE :—F. C. Huddle, Esq., London.

The following paper was then read.

GOD IN NATURE: SOME THEISTIC ARGUMENTS DRAWN FROM NATURAL PHENOMENA. By Professor EDWARD HULL, LL.D., F.R.S., Director of the Geological Survey of Ireland.

IT might seem incredible that, in this nineteenth century when philosophic research has demonstrated that our whole cosmic system consists of phenomena indicating marvellous adaptations and evidences of design, it should be necessary to remind mankind that such evidences exist: and the theist will gladly abandon the attempt to demonstrate that which to him is self-evident whenever the atheist desists from his attempt to prove that there is no God. But until this happy consummation arrives, the theist is bound to endeavour, humbly and reverently, to meet his opponent by arguments, perhaps, often used before, but which are by no means worn out by length of service.

Since the time when the Psalmist pointed to the Heavens as declaring the glory of God and the evidence of His handiwork, astronomy has made many grand discoveries as regards the laws regulating the Universe which were unknown when this inspired poet wrote. St. Paul appealed to

* May 5, 1890.

nature as bearing such clear evidence of the power of the Godhead that all mankind were without excuse whoever should ignore that evidence.* Even the more enlightened philosophers of pre-Christian times recognised the agency of the Creator in nature; though sometimes attributing to His direct action that which can only be properly considered as resulting from the operation of natural laws. This, perhaps, is the special distinction between the views of the ancient and modern theist.

I propose on the present occasion to select out of many examples of creative power two, drawn from the organic part of nature, which have always seemed to me to stand out from amongst those which we regard as ordinary examples; namely, 1. The origin of life on the globe, and 2. The origin of man. Both these problems are of profound interest to ourselves; but I do not regard them as evincing any exceptional or unusual exercise of Divine energy, as all natural phenomena stand on the same level in this respect; for as Pope has well expressed it: "All are but parts of one stupendous whole;" we ourselves and our surroundings all testify to the same Divine power.

1. *The Origin of Life on the Globe.*—It has been admirably argued by Locke that organic vitalised beings cannot have been originated from inorganic inert matter by its own force alone. This result of a process of reasoning finds support amongst many naturalists of eminence at the present day; and all attempts to originate life from lifeless matter, and to prove that life can be so originated, have so far failed.

Whether there be living beings in the other planets of our system, as inferred on astronomical grounds by Sir David Brewster, does not much concern ourselves. What we know about our own world is, that it is inhabited by living, organised beings; and we possess the most incontrovertible evidence that there was a period when such beings did not exist upon its surface. If, as there is every reason to suppose, our world was in a molten condition from heat—living beings could not have commenced to inhabit its surface till this had cooled down to a temperature below that at which albumen coagulates. Hence we have to account for the first appearance of living beings on our globe.

Professor Ernst Haeckel, who ridicules the idea of a miraculous origin for living beings, still makes no attempt to explain their origin from natural causes. I presume that he

* Romans i, 19, 20.

well knows that he cannot do so. In his outline of the Darwinian hypothesis he says:—"The theory which, through Darwin, has been placed at the head of all our knowledge of nature is usually called the doctrine of filiation, or the theory of descent. This doctrine affirms that all organisms . . . . are derived from one single, or from a few simple original, forms; and that they have developed themselves from these in the natural course of a gradual change."* Here "one single, or a few simple original, forms," are postulated; but we are not informed whence they came, or how they are to be accounted for. Unless it is affirmed that purely inorganic matter has had the power in the beginning of organic creation of developing out of itself these "few simple forms," or even one of them (an impossible hypothesis) then certainly we must call in the exercise of a Creative Power outside our world. There appears no escape from this alternative; and once Creative Power has been admitted it is futile to deny its exercise for all future time. It is surprising that Haeckel has not seen that his position is untenable. In adopting Darwin's hypothesis, Haeckel has omitted to adopt his master's declaration that he inferred "from 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 by the Creator."† This one form in a further page is amplified into "a few forms"‡ Whether the Darwinian hypothesis of Natural Selection is sufficient to account for the changes which organic bodies have undergone from the end of the Azoic period down to recent times is a question on which we may differ, and on which I may have something to say presently; but our great English naturalist clearly attributed both the original living forms and their supposed inherent laws of development to the interposition of a Divine Creator; and this being so, it is not necessary (in order to accept the Darwinian hypothesis) that we should banish the Creator from the universe.§

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* The theory thus stated is not very different from that of Lamarck; and it is scarcely full enough. *Naturliche Schopfungsgeschichte*, trans. by E. R. Lankester (1876).

† *The Origin of Species*, Edit., 1860, p. 484. ‡ P. 490.

§ Professor Sir W. Thomson in his Presidential Address at the meeting of the British Association at Edinburgh (1871) has hazarded an hypothesis to account for the origin of life on the globe which has few (if any) advocates; and which if proved correct would only move the question a step further back instead of answering it. Believing that there are

2. *The Origin of Man.*—It is worthy of remark that Darwin in his work "On the Origin of Species through Natural Selection," nowhere goes the length of including man amongst the results of natural laws working in accordance with his hypothesis. He states, indeed, that in the distant future, he sees open fields for far more important researches than he has undertaken; and that light will be thrown on the origin of man and his history.* This instructive omission arose—not as Professor Haeckel would have us to infer, because Darwin was apprehensive of causing a revulsion of feeling amongst his readers if he suggested a physical connection between man and the brute creation—but, as I presume, because the great naturalist clearly saw how vast is the gulf which separates man from the lower animal creation, and that his hypothesis was insufficient to account for the mental and, perhaps, even physical distinctions.

I am not now entering on the question whether man was originally descended from some quadrumanous animal or not. If he was, it is perfectly certain that the links which connected him with the existing quadrumana are altogether wanting. No one who compares the skull and skeleton of the orang-utan, the gibbon or the gorilla with (for example) that of a native African, can suppose that the one could have been connected with the other, except by a long series of intermediate forms which are not preserved to us. The absence of such intermediate forms (supposing them to have existed) is the more remarkable, because we cannot in this case plead the favourite argument of "the imperfection of the geological record;" unless it be asserted (which it may be) that the human species descended from the *Palæopithecus*, or *Macacus* of the Pliocene period through one line of ancestors whose remains have been lost, while the present monkeys have descended through another. But there is really no evidence for such an hypothesis; its truth can neither be asserted or denied.

In any case man's superiority over the brute creation lies not so much in differences in his form and structure as in his

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other worlds of life besides our own, he thinks it possible that in some collision between this world and a fragment from one of these worlds, the seeds of life may have reached the surface of the globe! He admits that this view "may seem wild and visionary," but it only shows how hard pressed he must have felt for any explanation from purely natural causes to account for the origin of life, when he had to fall back upon this. See Rep. Brit. Assoc., 1871, pp. 104 and 105.

* *Loc. cit.*, p. 518.

mental powers. Speech, the expression of the reasoning faculty, is man's grand distinctive attribute; and its origin cannot be explained on any plausible hypothesis except that it is a Divine gift. Lyell admits that the origin of language, with its capacity for grammatical construction and the inflections which denote number, time and quality, is a profound mystery;* and in the context he enters a well-needed warning to us of confounding the doctrines of "Variation" and "Natural Selection" with Creational laws, in which case we should deify secondary causes or immeasurably exaggerate their influence.

The language of primæval man was doubtless simple and its vocabulary limited, but it differed from the sounds emitted by the animals around him in its capacity for expansion, inflection, and grammatical construction. On the other hand, the roar of the lion, the cry of the hyæna, and the jabberings of the ape are now probably what they were thousands of years ago; they are incapable of being thrown into the forms of grammatical construction, and they are only used as expressions of the animal passions. May we not be permitted to include in the glories of speech the productions of the musical faculty, by which man is capable of expressing the noblest or most pathetic thoughts of his mind; by which he attempts to sing the praises of his Creator, or describe by sound feelings of joy, sorrow, love, or hatred? Sweet as are the notes of the thrush, the blackbird or the nightingale, they are only what they were hundreds or thousands of years ago, and are incapable of development or expansion. It is only the genius of man that can produce the symphonies of a Beethoven, or the anthems of a Handel and a Mendelssohn; and it is only mankind that can appreciate these masterful combinations and variations of sound. Similar conclusions, as Dr. Wallace has shown, may be drawn with regard to the mathematical and artistic faculties which are peculiar to man, and for the existence of which the theory of Natural Selection offers us no satisfactory explanation.† Finally, to man alone has been granted the gift of reason by which he can investigate the laws and conditions of the animate and physical world around him; by which he can compute the distances of the stars, or describe the motions of the planets, and by which he can place on record and transmit to posterity the

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* *Antiquity of Man*, 4th Edit., p. 518. † *Darwinism*, p. 461, *et seq.*

thoughts of his heart and the results of his investigations. As Dr. Wallace has shown, the moral and intellectual nature of man cannot be accounted for on the theory of descent; and these and the mathematical, musical and artistic faculties are the peculiar glories of mankind as distinguished from the brute creation.*

The great structural differences between man and the apes have been fully admitted by all anatomists, and are succinctly enumerated by Wallace, St. George Mivart, and others. These differences are so great that they have to be accounted for, on the Darwinian hypothesis, by throwing the origin of man back into the Pliocene, or, perhaps, the Miocene period. At the same time, the physical resemblances are no less striking and cannot be overlooked in the investigation of the problem of his origin. Dr. Wallace, who claims for man a spirit altogether transcending the instinct of the lower animals, regards the evidence of man's structural resemblance as conclusive of his origin from the Quadrumana. If we go with this eminent naturalist so far, and admit a remote but common ancestry for man and the ape, are we the less beholden to recognise the directing agency of the Creator in the evolution of this complex being? In the first place, in all our endeavours to explain the origin of man by any process of natural selection, we are still in the dark why man should have been the ultimate outcome at all! We are in the dark as to the cause why one family of apes in the Miocene or Pliocene period should have started in the career of advance *manwards*, while their brethren were left to remain apes down to the present day. A change in form and structure requires, according to the Darwinian hypothesis, a change in the conditions of environment; but for all ordinary purposes the physical conditions have been persistent through Tertiary times. The hypothesis implies in the words of Dr. Wallace, "that no creature can be improved beyond the necessities for the time being;" and if changes occurred in the physical or animate world around, necessitating an improvement in the structure of the Miocene apes, these ought to have produced modification in the same direction (though not perhaps in the same degree) in all the ape-tribe. One would like to have some light thrown on the process of development from the structure of the four-handed to the two-handed animal, where the hind-hands ultimately were converted into the foot of man, by which he stands and

* *Darwinism*, p. 461.

walks erect;—this erect attitude and upward gaze, recognised by the ancient Greeks as the distinguishing mark of man.* One would like also to have some light thrown on the process by which the brain in man became so enormously enlarged, that the proportions are as 48 or 49 ounces in man to 20 ounces in the gorilla; although the animal remained in a savage state, requiring no greater mental effort than that necessary for the supply of his physical wants and defence against enemies. We might inquire, also, why did the hair fall off his body ere he had commenced to cover himself with clothing in a region which, if Wallace's suggestion regarding the birthplace of man be correct, must have been liable to great alternations of cold and heat?† It is remarkable that the intermediate forms between man and the ape have not been discovered, though much weight need not be attached to this negative evidence. But whether we admit or deny the physical continuity of man and the fossil ape, we are justified in holding that on either hypothesis the outcome cannot be accounted for solely on natural causes. Natural selection there may have been, but supernatural selection there must have been also.

If I were permitted to illustrate my meaning by a case taken from Bible history, I would take that of the call of Abraham out of Ur of the Chaldees. Here God selected, out of the whole human race, one man and his family to found a nation in a new country, through whom all the families of the earth should be blessed, and whose descendants are amongst us at the present day. Some family, or tribe of apes, *may* have thus been specially selected as the progenitors of man, endowed with special powers of development denied to the other primates, and to some extent independent of changes in external conditions. He who considers such an origin for man to be a degradation of the race, let him ask himself whether man does not, by his own act and will, even now degrade himself below the brute creation? The brute in human form who, in the West of Ireland, maims dumb animals in order to injure their owners; or who, in the East of London, mutilates helpless women; or who, in Central Africa, shoots down half a village of unarmed and unsuspecting savages, and carries the remainder into slavery, or con-

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* Ἄνθρωπος.

† Haeckel with more probability places the birthplace in the submerged continent of Lemuria, at the head of the Indian Ocean.

verts them into beasts of burden,* has morally degraded his being below that of the brute creation around him. History abounds in examples of cruelty and baseness amongst men who, being reasoning beings, have less excuse than the lower animals for acts of ferocity; these being called forth for the supply of their wants or defence against foes. On the other hand, we who believe that man has a spiritual nature capable of immortality, can go a step further and recognise the dignity to which his race has been elevated in the person of the Divine Redeemer—both God and man; who by the union of the two natures has exalted him to a position amongst animated beings of illimitable and unspeakable glory.†

Let the disciples of Lamarck, Darwin, or Wallace, only recognise the agency of a Divine Power, directing the course of this world and of its inhabitants towards a noble and eternal destiny, and they will thus bring natural and spiritual law into harmony with each other; but we refuse to admit that natural law alone (even if such an agency be conceivable) suffices to account for the formation of man and his place in nature.

As a geologist I cannot shut my eyes to the evidence that this world has been throughout past ages in course of preparation for the abode of man and the sphere of his action. Not only are the fruits and seeds of plants of the present day suited for his food, but the animals which came into existence about the same period as himself are remarkably fitted to be both his companions and servants. We recognise in the dog, the horse, the ass, the camel, the elephant, and the ox—animals which, either by their bodily powers, sagacity, or capacity for attaching themselves to man, are almost inseparable from his presence—and essential to his everyday life. It is only in late Tertiary times that these forms were developed. And, as regards the evidence of design, united to the law of "descent with modification," the horse presents, perhaps, the most remarkable example to which palæontologists can point. Darwin, on witnessing the naked Guachos of South America bestriding the nearly wild horse of the Pampas, has observed how remarkably adapted to each other are the horse and his rider.‡ Yet the ancestry of the horse

* As described by Professor Drummond in *Tropical Africa*.

† Or, to use the language of very high authority, "so that two whole and perfect natures, that is to say, the Godhead and the Manhood, were joined together in One Person, never to be divided, whereof is one Christ." II. *Article of Religion.*

‡ *Naturalist's Voyage*, p. 143.

can be traced down from the Eocene period;—each successive stage being an advance on the preceding one,* till the horse, in all his beauty of form, fleetness of foot, and natural docility, becomes an inhabitant of the earth with man as his master.

On the other hand, I cannot but feel strongly that geology presents us with certain phenomena which have not been satisfactorily explained by any hypothesis of evolution yet propounded. Such, for example, is the remarkable persistency of some forms from very early geological periods to the present day, and this during numerous changes and modifications in the environment; while, on the other hand, we have examples (as in the case of the Liassic Ammonites) of repeated modifications of form under apparently similar, or but slightly modified, conditions. The introduction at particular periods of new types of organised forms, such as the vertebrates at the close of the Silurian period, although falling in with the general law of progression, has to be accounted for on the basis of design. Nor is this evidence of design abrogated by the discovery of forms which help to fill up the gaps in the succession of organised forms, such as the birds with teeth, which Professor Marsh regards as connecting the Dinosaurian reptiles with the true birds, and which are found in deposits of the Jurassic period; by such forms the gaps are being narrowed, if not bridged. But, while admitting that if there were no lost pages in the geological record, a complete chain of successive forms might be disclosed, it is no less necessary to recognise the directing agency of "Him in whom we live, move, and have our being; and by whom all things consist."

In attempting to explain the existence of the forms by which our world is peopled, there is reason to fear that the advocates of a purely secondary hypothesis are tempted to recognise analogies which are only imaginary, and to shut their eyes to evidence which appears to militate against their views; and it may be well, in conclusion, to revert to the weighty words of our President in his recent Annual Address, where he says, "It may be, that the impression thus left on the mind, will be that the votaries of science carried away by an excess of zeal in the attempt to discover the causes of natural phenomena, have really, though honestly, over-estimated the

* This development is most remarkable in the process by which the *Orohippus* of the Eocene is represented by the Hipparion of the early Pliocene, with three fully developed toes to each foot, and this by the Pliohippus of the later Pliocene; and this by the *Equus fossilis*.

evidence. It may be, on the other hand, that the inquirer will perceive the evidence to be weighty and substantial, in which case it behoves him to reconsider the supposition with which he started, that the conclusion was opposed to the teaching of Revelation."* Lord Bacon has well observed that a little knowledge tends towards scepticism, but a fuller knowledge, disclosing the links by which all natural phenomena are bound together, induces men to recognise the agency of God in Nature; and if men will not recognise this agency thus disclosed, neither will they be persuaded though one rose from the dead to bear testimony to it.†

The PRESIDENT.—I am sure all will heartily accord a vote of thanks to Professor Hull for his very valuable paper, and will only be sorry that a sudden summons to go to Canada, for which he has now sailed, has prevented him carrying out his intention of being present to-night.

[A discussion, which was only of a general character, ensued, after which the meeting was then adjourned.]

REMARKS ON THE FOREGOING PAPER.

The Rev. W. R. BLACKETT, M.A., writes:—Professor Hull seems to dwell more on the negative side of his subject than on the positive. It is well that we should have the weakness of the Darwinian theory once more pointed out to us; but we might have liked to have had the force of the argument from design more fully stated in the two particulars chiefly dwelt upon. The reasoning founded on the fact of the introduction of life upon our globe seems to be not strictly an argument from design: rather it maintains that this introduction can only be accounted for on

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* Sir G. G. Stokes, Pres. R.S. Journ. of Trans. of Victoria Institute, vol. xxii, p. 17.

† The *Westminster Review* for November contains an Article, by Professor Dewar, illustrating the way in which a man of science can sometimes give the rein to his fancy when dealing with biological problems.

the hypothesis of a creative fiat from a Being Himself living, conscious, powerful, and wise. Then, the adaptation to this life and the ever-advancing complexity of organisation connected with it of a thousand details as to the earth and its corresponding development, furnish a further argument properly from design: This is illustrated by the introduction along with man of so many animals fitted for his use. This argument would bear being more fully and explicitly drawn out.

On the negative side, it is a great advantage for us to have it clearly stated *by a geologist*, first that the development theory does not exclude, nor even render unnecessary, the idea of a Creator; and secondly, that the evidence for the theory is by no means sufficient to establish it. Any one with a common sense power of estimating evidence could see this latter point; but geologists, like other specialists, have been so fond of claiming an exclusive right of judging evidence in their own speciality, that we who *quoad hoc* are laymen, have been almost afraid to state our conviction of the insufficiency of the evidence, lest our doing so should be attributed to theological bigotry. We shall be glad to quote on our side the authority of so eminent a geologist. We owe him special thanks for the suggestion that scientists may possibly over-estimate the evidence for a desired conclusion. However, it has always appeared to me to be still more important to realise that there is no theological objection whatever to the theory of evolution, provided it be kept in mind that the theory is quite unable to account for the existence of life in the "one or very few forms" of life, which it postulates. It appears to me to enhance rather than detract from the glory of the Creator to believe that He impressed upon the primary living creature not only the marvellous attribute of life, but the still more amazing faculty of developing into the myriad forms of life that have been and are upon the globe.

With respect to the origin of man, it does not seem to me to be a good answer to the sentimental objection that man is degraded by having assigned to him a *pithecoid* ape as his ancestor, to point to man's self-degradation below the bestial level. Would it not be better to say that it is as noble to spring from a lower animal as to be formed from the dust of the earth? For in either case, the life and the spirit, which are man's distinction, come from the Creator, and not from the material origin. Is not the develop-

ment of spiritual Christians an instance of true evolution, not by natural selection, but by a Divine addition to previously existing characteristics ?

REPLY BY THE AUTHOR.

I agree with Mr. Blackett, that if we admit the agency of a Creator for the origin of man, it is of little importance as regards his dignity whether he were formed directly "from the dust of the ground," or by evolution from a tertiary ape. And in reference to his remark that I have dwelt rather on the negative side of the subject than the positive, I may reply that the latter (the positive evidence of design) is far too wide a subject to be dealt with, except by reference, in a communication of the present kind; his note, however, is a valuable supplement to my paper.

Perhaps I may be allowed to take this opportunity of mentioning in connection with what has above been said, that as I regard the Biblical account of Creation as a Divinely inspired word-picture of the origin of the world and its inhabitants, embodying the great laws of creation, the term "dust of the ground" appears to me to mean that the corporeal part of man is essentially that of the material elements of which terrestrial matter consists.

NOTE.

ON MAN'S PLACE IN NATURE.

As regards theories on this subject, one, which has been somewhat urged of late, is thus referred to by the President of the Institute, Sir G. Gabriel Stokes, P.R.S., in his paper *On the absence of real opposition between Science and Revelation* (Vol. XVII, p. 195). He says:—

"Some have endeavoured to combine the statements of Scripture with a modified hypothesis of continuous transmutation, by supposing that at a certain epoch in the world's history mental and moral powers were conferred by divine interposition on some animal that had been gradually modified in its bodily structure by natural causes till it took the form of man. As special interposition and special creation are here recognised, I do not see that religion has anything to lose by the adoption of this hypothesis; but neither do I see that science has anything to gain. Once admit special divine interposition, and science has come to the end of her tether. Those who find the idea helpful can adopt it; but for my own part this combination of the natural and the supernatural seems somewhat grotesque,* and I prefer resting in the statement of a special creation, without prying into its method."

Sir J. William Dawson, C.M.G., F.R.S., in his new work, *Modern ideas of Evolution*, thus refers to man, anatomically considered:—

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* Of course it is not to the combination in itself that this is meant to apply, but to the combination in our attempted reasoning; in other words, to the endeavour to infer from merely natural laws what was the condition anterior to the stage at which a supernatural power is supposed to have intervened.

"Anatomically considered, man is an animal of the class *Mammalia*. In that class, notwithstanding the heroic efforts of some modern detractors from his dignity to place him with the monkeys in the order *Primates*, he undoubtedly belongs to a distinct order. I have elsewhere argued that if he were an extinct animal, the study of the bones of his hand or of his head would suffice to convince any competent palæontologist that he represents a distinct order, as far apart from the highest apes as they are from the carnivora. That he belongs to a distinct family no anatomist denies, and the same unanimity of course obtains as to his generic and specific distinctness. On the other hand, no zoological systematist now doubts that all the races of men are specifically identical.