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ORDINARY MEETING, JANUARY 2, 1888.

THE RIGHT HONOURABLE LORD GRIMTHORPE, IN THE CHAIR.

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

ASSOCIATES :—Percival Frost, Esq., D.Sc., F.R.S., Cambridge ; R. G. Hobbes, Esq., F.R.S., London ; Lady Maxwell, of Calderwood ; Rev. F. Nimr, Cairo ; M. J. Sutton, Esq., F.L.S., F.R.G.S., Chevalier of the Legion of Honour, Reading ; The Princeton Theological Seminary.

The following paper was then read by Mr. H. Cadman Jones, the author, resident in Edinburgh, being unavoidably prevented being present.

ON THE THEORY OF NATURAL SELECTION AND THE THEORY OF DESIGN. The Point of View of Christian Thought. By PROFESSOR DUNS, D.D., F.R.S.E.

THE aim of the paper which I had the honour to submit to the Victoria Institute last year was to show that claims recently made in favour of Natural Selection as a substitute for the Theory of Design, both in biological research and inference, are not tenable. The rival theories of Special Creations and Organic Evolution were noticed. As, however, the subject was not the origin of species but the explanation of the structural and physiological fitness characteristic of these, no attempt was made to deal with the merits of either as a theory of origin. The discussion was throughout from the point of view of theism. In the able and kindly criticism of my paper, some things were said which suggested that several of my remarks would have had more weight had the *feeling* underlying them been more clearly indicated. The feeling, namely, that however important, in the present condition of scientific thought, the vindication of the warrant for the method of the purely theistic argument may be, it

does not go far enough to meet the exigencies of the times, while logically it ought. That theism alone is of highest value, and best fulfils its end, which is in conscious sympathy with Christianity, and, indeed, passes into it, by what we may call links of natural gradation. The seen and the unseen are not antagonistic spheres, they are only different aspects of the one sphere of possible knowledge. My former communication was strictly limited to a purely scientific examination of the data appealed to on behalf of natural selection as a substitute for the well-known theistic argument. No reference was made to the Bible, but it was, and always will be, impossible for any who have accepted it as The Word of God to forget that, but for its presence and influence, there could have been no discussion on the questions at issue. Why should not this be openly and freely acknowledged by Christian apologists, and the bias implied in this fairly estimated, seeing that the bias is not all on one side, and, especially, that the whole subject admits of full discussion as a scientific subject and not a theological doctrine? This is the point of view of the present contribution.

In my first paper it was remarked, "Since Mr. Darwin's death, we are in a position more favourable than before to form a just estimate of the nature, scientific value, and physico-theological scope of his work." But the liberty of criticism secured to his enthusiastic followers by the removal of the overawing presence of their great master, threatens to run to licence, and forebodes rupture in a hitherto compact band. Have those who hold *transformism* to be no longer an hypothesis but an established law begun to suspect the method by which they reached the explanation of the origin and nature of the facts alleged to give the law? The title of Darwin's great work is *On the Origin of Species by Natural Selection*, but within the last year (1886) a hitherto highly-pronounced Darwinian boldly tells us, that natural selection is not a theory of the origin of species, it is only a theory of adaptive structures in species.* He asserts that it fails to explain the mutual fertility among the same species, and the sterility among the offspring of different species; that it fails to explain the swamping effects of free intercrossing upon an individual variation; and that it fails to account for the fact that the variations which distinguish between species and species are often trivial differences of form or colour, or meaningless details of structure, whereas the only evidence

* *Nature*, Aug. 5, 1886, p. 314; Aug. 12, p. 336; Aug. 19, p. 362; Sept. 2, p. 407; Sept. 9, Sept. 16, Oct. 2, &c.

we have of natural selection as an operating cause is held to be derived from the utility of the results. "Physiological Selection, or Segregation of the Fit," is proposed as the rival and competing theory. The proposal has already originated a great controversy. Darwin's theory owes a good deal of its interest and popularity to the circumstance that its factors are, for the most part, open and demonstrable, and can be traced apart altogether from the speculations that accompany them. But the new-found factor lies far out of sight, and works among elements lurking in hidden conditions of the reproductive system. We may readily acknowledge the possibility, or even the likelihood, of changes in the "germ plasma," natural or spontaneous, abnormal or derived, as in any other system of organs, but to hold that in this we have the origin of the distinction between species and species is only "an idol of the den." What, however, most concerns us here is, that in the statement of the rival theory,* the scope of natural selection is much narrowed, and the claim on its behalf as a substitute for the theory of design is much more clearly defined,—it is not a theory of the origin of species, it is only a theory of the origin of adaptations. But, in view of all that has recently been urged to this intent, I repeat that its claims are not admissible. "It fails to give a satisfactory explanation of the differences among closely-related organisms, of the gradations and succession of organisms, of the complex phenomena of organs and functions and especially of sex, of the laws and limits of variation, of the law of reversion to type, or of the numberless adaptations implied in all these."

This reference to the recent attempt, on the part of an avowed Darwinian, to show that natural selection is not trustworthy as a theory of the origin of species, may be taken both as a note on my former communication and as an introduction to our present point of view. Looking at life and its manifestations, two theories hold the field of discussion, namely, the theory of organic evolution and the theory of special creations. We can notice only their general character and bearings. As regards the first, a number, chiefly of young biologists, when dealing with this subject are in the habit of prefacing their remarks with such strong statements as (I quote),—"The principle of evolution being now universally accepted," &c., or, "No one now questions that great law of the unity and continuity of life, the law of organic evolution," &c., or "the proof of transmutation by

* "Physiological Selection." See *Nature*, as before.

genetic descent is now complete; the question of special creations is no longer an open question, it has been definitely set aside by scientific demonstration!" Our opponents do not fail either in narrow dogmatism or cool assumption. But they forget that there are workers outside whose knowledge of the facts of science is quite equal to theirs, and who yet do not see their way to such strong statements; workers, moreover, who call no man master, and who refuse to relegate all creation and every organism to a force whose very existence is purely speculative. What is the use of urging the importance of the study of natural science, because of its value in opening the mind, disciplining the faculties, cultivating powers of observation, fostering right method in dealing with all sorts of subjects, if all this is ignored or set aside in obedience to the authority of one great name? But bowing to authority has not been favourable to clearness of intellectual vision. The question has been set in the midst of much confusion of thought. A consistent theory,* evolution implies the existence of a self-originated *something* in which all force,—chemical, vital, mental, moral,—is of its essence and ever potentially inherent. It refuses to recognise living, working personality in nature. It assumes that life lurking in matter, as a quality of matter, *somehow* became active and, outside of personality, realised organisms,—the specific rank of plant and animal being the expression and representation of the progressive steps, the animal series being represented by the links between the gelatinous speck of the protozoan and the body and mind of man. All this is held to be the fruit of the action of uncreated natural law, which, unliving, gave life; mindless, gave mind; indiscriminating, gave morality. It determines the history of nations. It has been the one influential factor in begetting the idea of a God, and in supplying man with a religion! And is this all we have to offer to an age worn to weariness by its heart-hunger after truth,—the theory of an ever-active, mindless, infinite force, and the denial of the existence of a loving, infinite Fatherhood? The question is, of intention, put in this sharp form, because, though this may not have been the evolution theory of Darwin, who acknowledged a creative starting-point, it is that of Darwinism. Yet there are men who, above all things, love truth and seek it, but who nevertheless, from lack of discrimination, attach their own meaning to the theory, and use its name for views out of all sympathy with it. Thus

* "Oscar Schmidt, Haeckel, and others, think that Darwin's reference to a Creator is the weakest part of his system."—*Trans. Vict. Inst.* vol. xx., p. 46.

many are misled. They mistake the theory for the fact of progressive divine Self Manifestation, a truth to which great prominence is given in the Word of God, and of which Nature furnishes innumerable proofs in the gradual building up of the earth, and in the ever-upward steps of the introduction of plants and animals, from their first appearance in geologic time till the opening of the present epoch. But this mode of revealing is not evolution, because it ascribes nature to God; it recognises the essential difference between spirit and matter; it subordinates the Law of Continuity to creative will, and it holds that the interactions and interdependencies of being are as suggestive of Omniscience in the Providence that guides them, as creation itself is of Omnipotence in the Personality by whom it was realised. That the bracketing of these two principles as identical in their origin and applications has begotten much perplexity in the department of Christian scientific thought, is not to be doubted. That it has not been more hurtful is to be ascribed to the fact that outside of these controversies there is an immense constituency,—the constituency of intelligent common-sense,—looking thoughtfully on, whose minds, trained and disciplined among and by the responsibilities, trials, and business of everyday life, are sharp enough to know that, as in morals the true test is, "by their fruits ye shall know them," so, applying the ordinary rules of evidence to the assertions and speculations of science, the test is, by their facts ye shall value them.

We are indebted to the Bible for the other leading theory of being,—the theory of special creations. Till a very recent date this satisfied both the leaders of science and of Christian thought. It satisfied Newton and Brewster and Clerk Maxwell, Linnæus, Cuvier and Agassiz, Butler and Paley and Chalmers. No doubt, in the latter half of the eighteenth and the early part of the nineteenth centuries, the so-called advanced (*die aufklärung*) school of theologians began to influence popular thought against this, as against most other doctrines of Holy Scripture, but their influence was not great. Now, it is noteworthy that most who dissent from the present Christian point of view seem to forget that this theory of special creations has a history. For example, no notice is taken of the fact that the great men just named not only embraced it as a working principle, but ably defended it. It was attacked on grounds precisely the same as those pleaded by recent opponents. The only difference between the transformism of Lamarck and the transmutation of recent speculatists, lies in the method by which their synthesis is

reached. The current views regarding the unbroken and unbreakable continuity of natural law are only a revival of M. Bonnet's dictum,—*non datur saltum in natura*. And as to method, it would be easy to show even Darwin's indebtedness to Lamarck's speculations touching "*medium*," "*habit*," and "*need*," for some of the strong points in his natural selection theory. While, then, even a glance at the history of thought on this question will show us that much recent speculation is no more than a re-statement of olden forms, it will also show us the ignorance of those who are fond of repeating that at no time have naturalists of repute been found identifying themselves with the theory of special creations. In my former communication a passage was quoted from the last paper which Agassiz wrote, clearly indicating his sympathy with the theory. In a previous paper he as clearly and forcibly gave full expression to this. "As I grow old in the ranks of science," he said, "I feel more and more the danger of stretching inferences from a few observations to a wide field. I see that the younger generation of naturalists are at this moment falling into the mistake of making assertions and presenting views as scientific principles which are not based on real observation. I think it time that some positive remonstrance be made against that tendency. The manner in which the evolution theory is treated would lead those who are not special zoologists to suppose that observations have been made by which it can be inferred that there is in nature such a thing as change among organised beings actually taking place. *There is no such thing on record.* It is shifting the ground from one field of observation to another to make this statement, and when the assertions go so far as to exclude from the domain of science those who will not be dragged into the mire of mere assertion, then it is time to protest." Too much prominence cannot be given to the question suggested by Agassiz. Evolutionists reiterate statements which beguile those who are not special zoologists into the impression, if not belief, that genetic changes are going on among our present fauna and flora. But recent explorations in the remains of very early periods of Egyptian history, and recent discoveries in pre-glacial and earliest post-glacial deposits, have shed a flood of light on this question. There is proof that the ibis and ostrich of to-day are as species identical with the ibis and ostrich of three thousand years ago. Mr. Carruthers, in his peculiarly able and interesting address at the opening of the Biological Section of the British Association in September last (1886), pointed out that Dr. Schweinfurth had discovered in mummy-wrappings the remains of

plants which had been gathered four thousand years ago, many of them identical with species now living in the Nile Valley. He also showed that in the earliest post-tertiary deposits remains of plants occur precisely the same as present species.

The theory of special creations may then be thus stated:—Living beings were at first formed in a mature state, and, by creative gift, like produced like through natural processes of reproduction and growth. That which was full grown ever preceded the embryo. Even now the zoologist can have no true knowledge of the embryo except in its association with the mature form, and the botanist no true knowledge of the seed apart from the plant that produced it. But we are asked: "Do you really believe that every plant and animal is a special creation, the result of a special act of Divine interposition?" The question is not fair. The doctrine of special creations implies that the multiplication and persistence of organisms are to be traced to the continued action of second causes,—the natural laws which determine reproduction and growth. And in tracing species, as such, to creative act, we refuse to make our belief responsible to science for the elucidation of all the elements which distinguish between original species and permanent varieties. Nor do we feel called upon to say more in answer to "the waste of power plea" than that to predicate waste of power on the part of an Omnipotent Creator is absurd. Scientific knowledge is the knowledge of facts observational or inferential, whether they are the facts of consciousness, or sense, or revelation, whose claims have been tested by methods other than those referred to here—methods, however, equally in the line of man's rational and spiritual nature as are those of pure science. In the method of knowing lies chiefly the certainty of the thing known. This principle has a wide sweep. It reaches to all the sources of knowledge. It is applicable in the world of mind as in the world of matter. It may find highest expression in the mental habits of men who have no knowledge of the terminology of science, and stand outside of all the advantages of its special training. But when scientific questions are raised and problems stated whose solution depends on the application of the ordinary rules of evidence, I would place more confidence in the opinions of men of practical common-sense than in those of experts.

The subjects under notice occupy at present much of the time and attention of intelligent men. As the opportunities and means of education increase, and the discoveries of science and their fruits multiply the interest will widen and deepen.

Much will depend on the point of view, both of the students of science themselves, and also of the great constituency of sympathetic onlookers. Can the mental bent of the students be indicated ? To group them as atheistic, agnostic, theistic, or Christian, might be taken as the concrete answer to this question. The differentiating process begins where observation becomes associated with philosophy, where effects are traced to causes, where phenomena suggest the idea of law, where fitnesses raise the question of intention, intention that of forethought, and forethought that of creative personality. And it is vain to hope to keep outside of all this by limiting scientific work to the bare knowledge of facts, and by attempts to separate things from the thoughts that underlie them. There is something so like human thought in the very forms of natural objects, and so like human skill in the proofs of adaptation in their constituent parts and in the inter-relations and inter-dependencies of most widely diverse species, as to awaken a kind of heart-hunger in sincere and honest observers after this *something* or *some one* to which, or to whom, all nature seems to point. Thus the vital importance of the point of view, whether of observation or of generalisation. The writer holds that the scientific interpretation of nature from the point of view of Christian thought is more in the line of true science than any other. Thus the Church is called to see that Christian thought and effort are ever kept in touch with the progress of science, welcoming its fruits, entering sympathetically into the intellectual difficulties of its workers, and ever according to them large liberty of honest speculation.

Little need be said of the atheistic standing-point. Where it is consciously held it seldom finds open expression. Men say it "in their heart." The intellectual condition underlying it finds rest in agnosticism, whose influence in the domains of natural and physical science is much more marked. Its rise and progress may be sketched in a few sentences. The discovery of fitnesses in organism, and between organisms and their environments, suggests purpose; purpose suggests personality which, in its turn, begets the desire to know something both of the purely psychical and moral attributes of personality—more light and fuller on the obligations as well as the objects of scientific research. These are not faced. Fitnesses are made barren by running them into a natural teleology from which design is excluded, on the plea that "the finite cannot comprehend the infinite." "We do not know that God is, and we do not know that He is not. We only know that if He is, He must be infinite, absolute, eternal, inconceivable, and unthinkable." The

difference between knowledge and omniscience is ignored. But, "we know in part," is as true in regard to our knowledge of the Creator as it is of our knowledge of creation. We can be in conscious fellowship with God, and influenced rationally by Him, within the range of our faculties; and to this extent a true and definite knowledge of God is within our reach. We know in part, but the part which we know is as true and real as it could be if we knew the whole.

There are some features of recent theism which indicate how much it is influenced by the science of the time. Seventeenth and eighteenth century deism implied that we have such a discovery of God in nature as renders any other revelation unnecessary. Its adherents openly rejected Christianity. They were, in the language of that time, "naturalists" or infidels, not atheists. Recent theism refuses to assume this attitude. Most of its adherents find in nature lavish materials to warrant the inference of creative personality, but they refuse to have any opinion of Christianity. They will not attack it; they simply ignore it. The conditions of public thought on this subject bear a striking resemblance to those that marked the first meeting between Christianity and the Alexandrian philosophy, though the circumstances of the times differ very widely. Christ's evangel began to pique the imagination, and even to touch the heart of the learned, and, as the forces of awakened thought in both departments mingled without organic union, attempts to harmonise them came in crowds, but the attempts only increased the perplexities. The lines of Christian evidence and doctrine became crossed and recrossed by philosophic speculation, until, in the long run, the speculatists themselves were bewildered. Every student of historical theology knows what the outcome was,—"apples of Sodom and clusters of Gomorrah."

Ever advancing science multiplies facts, the worthy rendering of which compels the recognition of an intelligent creator and of ceaseless creative working and guidance. But as these appear to many to raise questions which conflict with Christian impressions, and even with some of the most characteristic doctrines of Christianity, they try to relegate theism to one department and Christianity to another, different and independent. They assign to the latter a place of isolation, with a history, no doubt, but a history which either rejects or suspects the ordinary principles of historical criticism, and with doctrines for whose acceptance no logical reason can be given. But this implies a divorce between reason and faith, which is alien to the whole spirit

of Christianity, whose service is a reasonable service, and whose faith even can be justified to reason itself. It implies the triumph of an evil tendency, which is growing with the growth of science, the tendency to shunt revelation into a siding; to push the Word of God into isolation from the secular knowledge, political movements, and social life of the time. Now a good deal of this may be traced to the unwillingness of recent theists to go even one step beyond the old standing point. Their studies constrain them to run effects up to causes, and causes, in their turn, up to omnipotent and omniscient personality, where they halt. But if they would profit by nature's highest service to the doctrine of creation, they are logically bound to go farther. The science of observation falls short of its end if it pass not into the science of inference. That a right and true knowledge of the things that are made is designed to lead up to the understanding of "the invisible things, even eternal power and Godhead," we have the belief of one of the greatest thinkers of his own or of any time. And these aspects of the invisible and supernatural link themselves, one might almost say, in a rational way to doctrines which lie at the very heart of Christianity,—the leading doctrines of that gospel which is "the power of God unto salvation." The foot of the ladder of "revealing" is on the earth and in it, the top is lost to view amidst the light inaccessible around the sapphire throne. I am far from affirming that this testimony of nature must be read by all; far less that by the steps of this ladder all men must climb into Christ's Kingdom. I only affirm that theism fails in its high calling when it accepts nature's witness to the being and immanent presence of God as its *terminus ad quem;* when, in a word, it refuses to look at the evidence in proof of the existence of, to say the least, a thinkable link between Creation and the Bible, the two parts of the one revelation which God has made of himself to man. This inference as to a thinkable link between the two is so important that I would like to look at the data which warrant it from yet another point of view. Comparative zoology deals not only with recent, but with the remains of extinct forms. The latter, not less than the former, are literally crowded with materials suggestive of the leading positions of theism—order, contrivance. And not the least interesting of the facts of palæontology are those which discredit, or flatly contradict, many of the assertions of present speculative science. For example, oldest organisms are not really the simplest; the disappearance of the oldest was not merely the last step of a struggle for existence, waged throughout ages, vaster

than even imagination can grasp; it was the result of interference, sharp and sudden, with animals whose specific features were as deeply, definitely, and broadly outlined as they were at their introduction. The new types which came at remote intervals in geologic time were not the fruit of trivial or slight modifications of structure and form by the living, active influences of natural selection, for in that case the gradations would be traceable in the forms that preceded them; whereas all palæontology witnesses to the fact that their introduction was sudden, that they continued throughout long geologic ages unaltered, and that when they ceased, their remains in the uppermost strata in which they occur, differ in nothing from those in the lowest. Identical conditions may be predicated of recent forms. Simplest organisms hold the field as tenaciously as most complex ones. Species that have dropped out of present faunæ have not fallen in the struggle for existence against healthier or incidentally better equipped individuals of the same species, or against closely related species, but in the struggle against man. If the great auk has passed from among birds, and if the American buffalo is passing from among mammals, it is because man found them convenient for food, and they have no chance against the snare, and the arrow, and the knife, and the rifle, in their struggle with man.

In his survey of the two great departments, palæontology and recent forms, man sees everywhere the past shedding light on the present, and the present on the past. Early simple forms become to him the promise and the prophecy of those that are highly complex. Composite types, as where fish and reptile occur in one genus, are seen differentiating, their rank as types being determined by concentration rather than by complexity of organs, and corresponding psychical advance keeping in line with physical development, till reason-endowed man appears, the head and crown of life. Man, the interpreter of nature ("*homo minister et interpres naturæ*"), takes all the past and all the present worlds of life and vegetation into the presence of the Creator, as having found in them motives for worship, materials for praise: "O Lord, how manifold are Thy works! in wisdom hast Thou made them all. The earth is full of Thy riches. So is this great sea."

If, then, all through the great epochs of geologic time, and all through the long ages that have run since the forms that now surround man were introduced, the environments of animals have ever been adapted to their instincts and appetites, is it the least likely that man would be the single exception to this? Is it, in face of the fitnesses between

all other living forms and their surroundings, conceivable that man alone would be endowed with powers for whose exercise no provision had been made, and for whose satisfaction no objects had been provided? Is it credible that amplest means were put within reach for the gratification of his instincts and appetites, and yet that none were furnished for that of his moral faculties? There is only one sufficient answer to such questions,—an answer, however, which cannot be given without bringing into full view the steps which lead up to it. In our study of nature we meet with adaptations which imply forethought, contriving wisdom, creative personality, creative beneficence; moral elements come into play, conscience is active, there are conscious moral relations between man and the personality discovered in creation,—relations whose recognition bring with it a class of wants for which satisfaction is not to be found in nature, the scientific study of which has forced from observers the recognition of an all-pervading personality, the light of whose presence has quickened and intensified the very sense of evil and the desire after good, and the search after God, which yet nature can do nothing to gratify. God recognises the wants of "his own offspring," and provides for their gratification. Thus the crowning adaptation,—the adaptation between the Gospel and the spiritual constitution of man. Theism slopes upward into Christianity, and lays its lavish testimony to the manifold wisdom of God at the feet of Him to whom the wise men of old brought their gifts, gold, frankincense, and myrrh: "He is Lord of all." But are not Christian apologists apt to attach too great value to the mere acknowledgment of a God by some distinguished workers? What is wanted, even for their own sake, and the world's sake, and the Church's sake, is something that will put heart into their confession, set their high attainments all aglow with a light and warmth more than human, and lead to a personal consecration whose intensity and intellectual breadth would find fittest expression in the words, "for me to live is Christ." This attitude far transcends that of theism, and the worker finds himself at home with a new doctrine, that of Christ's creatorship. Nature has a Christology whose exposition and illustration depend on the same methods as those of scripture Christology. Faith leads the observer into a sphere outside of, yet concentric with, that in which the organs of sense have scope and exercise, and in which the great and pressing question of our age,—the question of the origin of all things,—finds an answer: "Through faith we understand that the worlds were framed by the word of God, so that the things

which are seen were not made of the things which do appear." The supernatural testimony of Revelation completes that of nature to creative personality. True, the facts of Revelation are not discoverable by reason. But, while the domains of thought are enlarged, and the objects of thought multiplied, the qualities of thought are identical in both spheres. The faith which finds opportunities innumerable of exercise among the works of nature, is precisely the same power as that by which we deal with the facts of revelation. And its exercise, in the latter department, is no more inconsistent or out of harmony with reason, than its exercise is in the former, while the new standing point is in complete accord with science. In the present conditions of thought, touching the borderland between science and scripture, the importance of this cannot be over-estimated. In scientific lines, and by the method of science, the *Christian* student may reach a knowledge of God as true and trustworthy as the knowledge he may have of his fellow men,—a knowledge which enters experience and becomes truly our own, and, as our own, is felt to be both rational and logical. Natural fitnesses, either between the individual parts of organisms, or in the relations of similar or different organisms to one another, are as good towards the inference of intelligent creative personality as corresponding fitnesses in the products of human skill are towards the inference of intelligent human personality,—a personality in both cases resembling our own. We can thus acknowledge the fairness of the charge of anthropomorphism. It is made as a term of reproach, we accept it as a testimony to man's origin,—"God created man in His own image." By this, man is drawn to seek after God in His own works, and, when he finds in these proofs of thought and forethought and intention, the mental qualities which are his, as one of God's children, fit him for knowing the Father. Thus, indeed, the chief element of strength in the doctrine of final causes. [Now, when we change the point of view from theism to Christianity, *and when faith accepts the New Testament doctrine of Creatorship*, then, and not till then, in lines and by a method as trustworthy from the latter as from the former point of view, we may reach the inference that He who is King, eternal, immortal, and invisible, by whom "all things were created that are in heaven and that are in earth, visible and invisible," "by whom all things consist," and without whom "was not anything made that was made," is none else than He on whose cross was written, "This is Jesus the King of the Jews." But the steps of legitimate inference end not till we reach the words, "By

whom we have redemption and the forgiveness of sin." Now, would not much be gained were Christian apologists to insist that theism can only be of highest value as a starting point, a *terminus à quo*—a point from which to pass to the Bible views of Creator and Creation? Frankly avowing, however, that this is done to bring full in view the grand truths inseparably linked up with Christ's Creatorship, even His Incarnation, Atonement, and Resurrection.]

The CHAIRMAN (Right Honourable Lord Grimthorpe).—Our thanks are due to Professor Duns for his paper, which has been so admirably read by Mr. Cadman Jones. I need not say that the subject dealt with is a very important one. With regard to the paper itself, I hardly know what to say. To say that I agree with it in general would be to say nothing, and I am afraid I cannot say I agree with it in all its details. I agree with some of the general propositions, such as that which asserts that theism without Christianity is very imperfect, and a good deal more which I need not repeat. But the question which occurs to me on reading papers of this sort is, What good are they likely to do? What practical lesson is to be drawn from this paper, and what is to be carried away by those who have heard it? Do you believe any more or any less in either of the two propositions which Professor Duns has rightly stated as the only alternatives? I must say I was struck with this. In one part of the paper the author says:—"But we are asked, 'Do you really believe that every plant and animal is a special creation, the result of a special act of Divine interposition?'" and then he says "The question is not fair." I really do not see why it is not fair. The answer may be easy, or difficult, or there may be several answers; but the man who propounds any kind of scientific theory is bound to be prepared to answer any question which is not absurd or demonstrably unfair. A question is not made unfair by saying it is so. Dr. Whewell, one of the most distinguished men of his time, and opposed to Darwinism then, faced this very question, and said distinctly that he thought it was fair, because there were only two alternatives they must accept,—either transformation or creation. As Dr. Whewell answered the question, "transformation means what is commonly called evolution." There is another remark I would make on this paper, and that is that there is a good deal of unnecessary verbal criticism in it. What, I ask, can it signify whether

Darwin's book is properly called the *Origin of Species* or not? No doubt, if we had discussed the matter with Darwin himself, he,—the most candid of men,—might have said, "Whether it is the right term or not, what I mean is, 'the cause of the change of species or of the production of new species.'" But Darwin expressly disavowed the intention of tracing all species up to their origin; and so he said over and over again. Indeed, I cannot help thinking that a good many people do not, or will not, recollect what Darwin himself frequently said. Take the last sentence in his *Origin of Species*:—"There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms, or into one." Is anybody here prepared to deny that? People very often confound Darwin with such mischievous writers as Haeckel and Spencer, who assume everything they want, and whose logic is as illogical as possible. I am glad to see that Darwin had in his heart much the same opinion of Spencer's philosophy as I expressed in this room four years ago. He said he could not understand Spencer; which meant a great deal, from him. He suspected Spencer's "principles," by inventing a few of which he pretended to generate the world. You will see from that paper of mine what prodigious folly that leads to; and, as I have shown, Darwin did not believe in Spencer's so-called principles a bit. Haeckel and the atheists, and the persistent-force men, say the weak part of the Darwinian theory is that Darwin did not agree with them; that he recognised the necessity for a Creator. Therefore, when Professor Duns and others talk about Darwin and Darwinism, they should remember what Darwinism means. There may be people who are a great deal more Darwinian,—if one may use the term, though it is wrong,—than Darwin; or rather, who are more revolutionary or evolutionary than Darwin. People fancied that Darwin's views and theories led necessarily or logically to atheism; but Darwin said they did not; and this will be seen not only from the passage I have read to you, but from another which I take from a letter to Dr. Asa Gray, where he says:—"I am inclined to look at everything as resulting from DESIGNED LAWS, with the details, good or bad, left to the working out of what we may call chance,"—though elsewhere he explains that chance only means the necessary result of the laws in one direction or another, and he adds, "Let each man hope and believe what he can. Certainly I agree with you that my views are not at all necessarily atheistical." Nothing could be more decisive or clear than

this. Then he goes on to say, "I can see no reason why a man or any other animal may not have been aboriginally produced by laws which may have been expressly designed by an omniscient Creator, who foresaw every future event and consequence." You will see in various parts of Paley's *Natural Theology*,—a book which I never open without wonder at its logical and scientific power, considering how much has been learned since,—that he anticipated "the possibility of its being proved that things are produced with mechanical dispositions fixed beforehand by intelligent appointment," besides demonstrating the impossibility of their existing without it. Paley had a kind of instinct (and he was a great mathematician and natural, as well as moral, philosopher), which led him to think the time might come when it would be seen that there must be continual creation by changes going on from time to time, producing one animal of one species at one period and another at another, and all produced by mechanical laws made by the Creator whenever the world began, or rather, before it could begin. I see no difference between Paley and Darwin as to this. We know that Darwin gradually slid out of a belief in Christianity, because he would not believe in miracles,—not out of a belief in a Creator, but out of a belief in Revelation; but that has no relation to this question. Carrying on the same line of argument, I cannot help thinking that Dr. Duns has rather overlooked some necessary things in giving his catalogue of great men who are satisfied with the theory of special creation, taken in its common sense. He says, "It satisfied Newton and Brewster." How could it help satisfying them when no other theory was before the world? Darwin's theory was founded on an enormous collection of facts,—and not on facts alone, but on inferences from them. Some one must make the collection, and Darwin began it in reality during his voyage in the *Beagle*. Newton, Linnæus, and Cuvier had them not. I think Agassiz, who differed from Darwin, was by no means so great a philosopher as some who agreed with him. To talk of Butler and Chalmers is out of the question. Butler was the greatest reasoner of the day on the facts then known; while Chalmers was only a theologian and preacher, though a great one. Clerk Maxwell did not live to see a great deal that has been discovered since. This paper asserts that nothing has been discovered since Darwin confirming his views. For my part I have read enough to believe that every discovery made in the direction of Darwin is made in the direction of transformation of species under laws of

nature, which are laws of the Creator, though not in a direction pointing to a self-creation of species, or of anything at all without a primary cause. As far as I can find out, almost every discovery made in palæontology and other things has tended to fill up the gaps left in Darwin's discoveries; or rather, I should say, to reduce the size of the gaps. People are too apt to forget that a small gap requires a power to leap over it just as much as a great one, speaking philosophically and in looking for causes. Darwin not only knew there were gaps, but said so over and over again. There never was a more candid writer, and, as has often been said, he stated objections to his own theory stronger than any others that were put forward. He had faith in some of the gaps being filled up as time went on. I need hardly say I am not an evolutionist to the extent of believing that any evolutionary theory will account for everything. On the contrary, I argued in the paper I have referred to, that every change, however large or small, is a creative act, not necessarily made as an act of interference, but as the result of laws of nature going far deeper than we know anything about. I mentioned in that paper the case of "calculating boys," of whom I have known two or three in my life, and I said there was one of my own profession, a Q.C., who could work in his head in a moment questions that would take any of us at least ten minutes to solve. Now, how does that arise? How can such a thing be the result of chance? Darwin explained what he means by chance. Of course, he knew there is no such thing as chance strictly, and cannot be; that that which we call chance is the result of certain laws of nature which we partly understand and partly do not understand. I said in that same paper there is not a grain of dust that falls by what we call chance or that does not fall according to a law of nature; and that is an obvious truism. Darwin used the word "chance" as meaning the necessary result of some laws of nature. Whatever the laws of nature ordain must be accepted as a necessary and logical result of them, for we cannot conceive the Creator altering the multiplication-table or the laws of geometry; and therefore we say that, whatever logically and mathematically follows from any law of nature cannot be avoided. As Darwin said somewhere, the results may be good or bad, but if they come from a law of nature, although they may be called the results of chance, they are the results of a law of nature all the same. And so, when a new organ appears in a body in which it has never appeared before, it has been created not the less

because it is a small change than if it were a great one. The calculating boys had not calculating fathers; and nothing can of itself give a greater power than it has. An instance Darwin mentions is one of a comparatively great, though sudden, change. He says that nectarines sometimes grow spontaneously on the boughs of peach-trees. You may think that is not much; but a nectarine is not like a peach; the two are very much unlike in taste, in skin, in texture, or flesh. Something which we cannot explain, something which Darwin calls chance, brings, every now and then, a nectarine out of a peach-tree. And so, when this paper says "That which was full-grown ever preceded the embryo," that, I say, is a loose way of talking. Something that was full-grown preceded always the embryo; but what has to be accounted for, and what in reality can never be accounted for except by some creative theory, is, why the embryo ever grows up into something different from that which produced it. There is the preliminary difficulty, which the Haeckelites and Spencerites have never faced. Why did generation ever take place? I only mention these things as specimens, and I am giving them in both directions,—specimens, if you will allow me to say so, to prevent your confounding these matters with the mere physical question of the origin of species, *i.e.*, of variations, and indulging in loose reasoning. Another proof of the incompetence of the evolutionists to explain the origin of the world or its present state without a Creator,—and the more I reflect upon it the stronger it seems to me,—is that which I did my best to expound here last year in my paper on the Beauty of Nature. I cannot even see that any evolutionist has ever made a fairly honest attempt to account for it on their principles, or can honestly have persuaded himself that he has done so. Most of them are the merest evasions of difficulties which they cannot face. Darwin evidently perceived himself to be helpless about it. The little bits of beauty within a very small domain of nature, for which they have invented guesses, are worth nothing as a theory, whether those guesses are right or wrong; for a theory which only professes to account for a small, or even a large, proportion of the phenomena which it ought to account for, but not for all, is no theory worth attending to, according to all the rules of science. And so it seems to me that the real objection to Spontaneous Evolution as a theory of Cosmogony, and the true line to take about it, which would be equally true if every suspected missing link were found,

is, that it accounts neither for the origin of life, nor for any kind of generation, nor for the production or growth of animals or vegetables from seeds, nor for any offspring having more powers than their parents, nor for the beauty of nature generally, nor for the existence of any laws of nature; for the origin of which not even Mr. Spencer can find more to say than they are "unfathomable mysteries," and that the existence of matter without them is what he is pleased to call "unthinkable," whatever that may mean. It seems to me that this is far more than enough to say against any theory that professes to account for everything.

Rev. J. C. WALKER.—It is a very curious fact in nature that an animal if produced by one that has been frightened takes the colour of the animal that gave the fright.

The CHAIRMAN.—The question is,—Why do changes of this kind take place—when they do, which is very seldom? And why does any change take place? Variation only comes because a law of nature has been ordained which makes it come when it is needed?

Rev. J. C. WALKER.—Animals become quite different on different soils.

The CHAIRMAN.—Yes, and why do they? It is all very well to say they adapt themselves to circumstances, climate, and soil, but how do they so adapt themselves? You cannot account for that. Professor Duns' friends seem to think that his first paper was not theistic enough. I can hardly understand that; and when he says he cannot accept natural selection as a substitute for the well-known theistical argument, how much does he mean? The only theistical argument of rational men now is that everything must have proceeded somehow from the Creator. What has natural selection to do with that? Paley anticipated that it would be proved some day that the Creator produced all things in nature by a provision that they should change according to circumstances, and be able to adapt themselves to variations of soil and climate, and so forth. Dr. Duns says:—"The whole subject admits of full discussion as a scientific subject, and not a theological doctrine." What does that mean? Of course, it is true in a sense, but it contradicts what he said before. He previously said that he reads this paper because some people found fault with his former one as not being sufficiently theistic, and then he says, "The whole subject admits of full discussion as a scientific subject and not a theological doctrine." The question of transformation as a mere question of fact, does not admit of discussion as a theological question. Darwin says you

can discuss the transmutation of species without the slightest reference to theology. Huxley says, in one of his dexterous phrases which imply more than he ventures to express, "Materialism is a very good working theory." Yes, I reply, it is; and so is gravity a good working theory; but you are here to tell us, not why gravity comes out well as a working theory when it is set to work, but who set it to work? That is the point. But we are told that theism alone is not sufficient without Christianity, and that we are not to rejoice too much over "the mere acknowledgment of a God by some distinguished workers." Of course; but sufficient for what? I ask what has Christianity to do with the theory of the transmutation of species? Christianity, depend upon it, never will be proved by anything except that which proved it originally, and forced it on a hostile world, viz., evidence of its miracles. I read this afternoon a curious illustration of the danger of putting Christianity on new grounds. Professor St. George Mivart, a distinguished scientist, is a Roman Catholic, and he says he rests everything on the authority of the Church, *i.e.*, his Church; for we Protestants certainly do not. He says distinctly:—"I admit that I do not believe the things that are stated in the Old Testament, or even in the New, as visible manifestations; but I accept them on the authority of the Church": which is very like saying, "I say that I believe on the authority of the Church things that in fact I do not believe at all." He has been attacked for that by a very astute antagonist, Sir James Stephen; and if you wish to see a theory completely smashed and stamped upon you will read his article in the *Nineteenth Century*. I am sorry to say that Sir James Stephen does not hold our opinions on theology, and I only bring this forward as showing the danger of preferring to rest Christianity on other grounds than those which established it, and were always appealed to by its Author and His followers. The other day I was talking about this, and some one said, "You don't mean to say you rest Christianity on miracles." I said, "What else do you rest it on? How did it ever get into the world without?" and my interrogator was floored. It is, *a fortiori*, dangerous to mix up Christianity with science. They have nothing to do with each other. They are each the work of God, and are therefore equally true; but if you attach Christianity to a particular scientific theory, you run this risk, that your particular scientific theory may get knocked on the head, and then your opponent tells you, "You chose to rest your Christianity on your scientific theory. I have refuted your

scientific theory: where is your Christianity?" That is the danger of such a mode of reasoning, It is with this, as with all things relating to the Bible and theology; and I say that if people run away from or give up the original grounds on which both were established they are sure to fall. On this point I venture to refer you to my little tract or book on *Huxley and Hume on Miracles* (S.P.C.K.), which has never been answered, so far as I know. For all these reasons, I say that, although I agree with the spirit of a good deal contained in Dr. Duns' paper, I cannot honestly say that I think it the best mode of writing for the purpose.

The HON. SECRETARY (Captain F. PETRIE, F.G.S.).—The following communications have been received in regard to Professor Duns' paper.

The Reverend Canon Saumarez Smith, B.D., Principal of St. Aidan's College, Birkenhead, writes:—

"The Professor's paper is a very useful and suggestive one. His object seems to be to *Christianize*, if I may so say, the study of Natural Science. In place of the late Mr. Darwin's assertion that 'Science has nothing to do with Christ, except so far as the habit of scientific research makes a man cautious in admitting evidence,' the writer of this paper in effect asserts that students ought not to be content with even the *theistic* inference from Nature, but, finding in Theism a testimony to 'creative personality,' should not shrink from further research into what that recognition involves. The Bible, with its proffered Revelations, should not be 'shunted into a siding,' as if it were a useless or dangerous block in the way of science. It should rather be used as another engine for real and rational progress in knowledge. Charles Darwin was an instance of a man who vacillated between an indefinite kind of theistic sentiment and an agnosticism which resulted from the refusal to entertain, or 'think deeply' on, religious subjects: for, as he acknowledges, he had 'never systematically thought much on religion in relation to science, or morals in relation to society.' In other words, he was a *mere* naturalist, and not a moralist."

"It is relevant to note that the theory of 'natural selection' is specially stated by Mr. Darwin to have driven him from the theistic inference to which 'the old argument of design from Nature' leads.

"The ambiguity of the terms 'Evolution,' or 'Darwinism,' leads, as Professor Duns points out, to great confusion in argument. An 'evolution' which is regarded as a portion of the divinely-ordered

processes whereby the Primal Providence of God acts in nature, is a very different conception from the 'Evolution' which is viewed as an operative, blind Force, that, without God, somehow, in an endless succession of ages, unrolls, from nothing at all, everything that exists, whether in the material or moral spheres of fact and observation.

"The Bible cannot fairly be ignored (though it ought to be criticised and tested) in relation to questions of natural science, wherever such questions are concerned with theories of origin. For this collection of ancient books, with a remarkably persistent consistency of statement, which runs through long and diverse periods, refers the origin of the universe to a Self-existent Being, who is 'the Former of all things,' and concerns Himself with the moral, as well as with the material, environment of mankind. This Bible teaches us that a theory of special creation (or creations) stands at the head of all attainable knowledge. Parallel with the statement of the theory in the paper that 'that which was full grown preceded the embryo,' the sublime and vast idea is present to the mind of the Christian student that *God precedes all*, and that from the Divine 'Fulness' goes forth a creative 'Word,' and a fertilising 'Life,' whereby the universe is constituted, ruled, and preserved. This, though a necessarily mysterious theory, is surely a more reasonable and satisfactory one than the unproved and unverified theory of a mere natural 'evolution.'

"Has the theory of special creations been disproved, or discredited? The great advance in knowledge of natural phenomena, and in consequent materials for inferential or speculative conclusions as to laws of Nature, or genetic processes in diversified vehicles of life, may lead men to alter and modify older definitions or dogmas; but it has done nothing to shake the fundamental position that in the beginning God created the heavens and the earth. This being so, 'the Bible views of Creator and creation' ought not only not to be scouted as unscientific, but ought to lead the students of Nature to prosecute the study of the Bible, and to endeavour to find the real connexion existing between the material and moral spheres of research; spheres which, although in many points distinct, are yet also in many points in contact, and may not be continuously treated as dissociated from each other.

"The scientist has no right to say, 'I have no need of Revelation,' any more than the Christian philosopher or theologian has a right to say, 'I have nothing to do with science.'

'The genuine seeker after truth should not 'be content to *remain* an agnostic,' or wish to become what Mr. Darwin has said he himself became—'colour-blind' to religious conceptions. And the Christian student of science gains by the *Christology* of the Bible an insight into the sublimest views both of Nature and of the faculties and destiny of man."

Mr. HASTINGS C. DENT, C.E., F.L.S., writes :—

"Professor Duns' paper is a very valuable one indeed, and the author deserves not only our best thanks, but also our support by the hearty expression of our ideas as to matters of detail, for which there is a vast scope by corroborative evidence. Our watchword should be 'Union is strength,' and I fear this is perhaps scarcely enough considered by many who are endeavouring to express—according to their convictions—the true unity of the book of Revelation and the book of Nature. While I thoroughly agree with the author '*that* theism alone is of highest value . . . . which is in conscious sympathy with Christianity,' I must confess that in our conflict with agnosticism and atheism it seems to me that we lay ourselves open to be assailed on matters entirely beside the point we are arguing if we take our standpoint on Christianity as an axiom. Christianity is a purely metaphysical and religious question, and therefore I humbly submit that we should not bring the subject of our Holy Faith into the discussion. The great difference is this: that, while our belief as to the origin of things which are seen can be worked out reasonably on scientific lines to support our faith in God as the *Creator*, and *not* the *Evolver*; our faith in the transcendental mysteries of the Incarnation of our Blessed Redeemer and His Atonement cannot be thus laid down for logical acceptance by the unbeliever. But I agree so thoroughly with the author's words (p. 120) :—'The Church is called to see that Christian thought and effort are ever kept in touch with the progress of science, welcoming its fruits, entering sympathetically into the intellectual difficulties of its workers, and even according to them large liberty of honest speculation.' It is to this facet of the crystal of truth I feel drawn to direct my few remarks. I would not welcome as comrades in the fight any who do not uphold the Bible; but to assert to our opponents that our standpoint is the Catholic or Christian Faith is rather different. The bigotry and intolerance of some ecclesiastics have led some men, who are working in the domain of the physical and natural sciences, to

throw over as insupportable the bonds by which their predecessors had been held, or in which they had themselves been educated. The result has been equally disastrous both to the interests of Christianity and of science. I have referred to this in my book *A Year in Brazil*, in a chapter on the Theory of Evolution, where I say:—'Whereinsoever scientific men have attempted to disprove certain spiritual truths as doctrines, such as the efficacy of prayer, the possibility of miracles, &c., they have dealt with things outside their province. Mathematics, physics, biology, do not afford an explanation of the spiritual world. The finite mind cannot comprehend the Infinite, but it may apprehend it by accepting revealed truth. On the other hand, whereinsoever ecclesiastical dogmatism has decreed certain explanations of phenomena or conditions of the natural world, which explanations have been proved to be contrary to fact by scientific discoveries, therein such dogmas are manifestly erroneous, and are the results of human interpretations of the text of Scripture; which writings were inspired, not to teach man what he might find out for himself, not to instruct in natural science, but to reveal how the creature may approach the Creator. In each case, therefore, the apologists of party have argued from the known to the unknown, and the result has been a confusion of ideas—generally, if not invariably, the result of a warped and bigoted intellect. Life is too short, its duties are too momentous, for us to spend our few days in speculation. One thing is evident, man *has* a body, and *is* a spirit which will live for ever. Revelation tells him how to prepare for that future life. Meanwhile, there are thousands who, knowing, believing in, and loving this grand truth, can afford a few hours occasionally . . . to devote to the study of nature. If they approach it with the feelings of the psalmist: "Lord, how manifold are Thy works! in wisdom Thou hast made them all;" to them the study is not only of the deepest interest in itself, but, by increasing their knowledge and appreciation of the wonderfully intricate works of the Great Creator, it assures them that if He can so carefully arrange the complicated adjustments which are necessary for the well-being of the whole organic world, and can watch over all the smallest organisms that He has created, so much the more they who are formed in His image, after His likeness, are His special care. Thus . . . they may through nature be led up to nature's God, and acknowledge that He, the Omniscient, the Omnipresent, the Omnipotent, "hath done all things well."'

"In conclusion, with regard to the interpretations offered by certain

writers on the first chapter of Genesis, I would quote the words of the Duke of Argyll:—'the first chapter of Genesis stands alone among the traditions of mankind in the wonderful simplicity and grandeur of its words. Specially remarkable—miraculous it seems to me—is that character of reserve which leaves open to reason all that reason may be able to attain. The meaning of these words seems always to be a meaning ahead of science; not because it anticipates the results of science.'"

The meeting was then adjourned.

THE AUTHOR'S REPLY.

My reply deals only with the leading review and criticism of my paper. To discuss fully the topics, relevant and irrelevant, referred to would demand more space than the paper itself. But I wish to be brief:—(1) "What practical lesson is to be drawn from the paper?" One lesson is, that something to the point can be said in favour of the doctrine of special creations, in the face of attempts to discredit it by such assumptions as the critic condemns in Haeckel and Spencer, "who assume," he says, "everything they want, and whose logic is as illogical as possible." (2) "The question is not fair." "I really do not see why it is not fair." The two sentences which follow show well enough why it is not fair. It is "demonstrably unfair," because it is put with the view of committing the writer to the demonstrably unscientific opinion that numberless so-called permanent varieties, which go by the name of species, are the fruit of special creative acts. It is "demonstrably unfair," because those who put it, if we may credit them with ordinary intelligence, must know that the advocates of the doctrine of special creations ascribe to organisms great plasticity, even while they refuse to attribute change to mere mechanical cause. (3) "Every change, however large or small, is a creative act, not necessarily made as an interference, but as the result of laws of nature going far deeper than we know anything about." Clearly we attach different meanings to the terms "creative acts." But to confound the action of divinely-guided second causes with the act of special creations, seems to me to lead to the threshold at least of a department more congenial to "loose reasoning" than to scientific discussion. Final causes are not miracles. (4) "How could it help satisfying them when no other theory was before the world?" The querist ignores the whole history of thought on the subject—the Darwinism before Darwin—a copious literature which will force all who have a competent knowledge of it to refuse to Darwinism the interest of a new thing under the sun. I affirm that there are very few, if any, vital points in that system which may not be found in French literature of specu-

lative science, towards the end of the eighteenth and the beginning of the present century. Does the critic believe that either Newton or Brewster was ignorant of the *De Rerum Natura* of Lucretius? As to both, there is the fullest proof to the contrary. Then, as to most of the other names mentioned, is it the least likely that they were not familiar with the speculative views of Lamarck? But more, one of the most interesting of Chalmers's early papers was a review of the *Système de la Nature* of M. Mirabaud (Baron d'Holbach). "Chalmers was only a theologian and a preacher." The author of this remark has forgotten the St. Andrew's University mathematical and chemical lectures. (5) "What can it signify whether Darwin's book is properly called the Origin of Species or not?" Turn to the numbers of *Nature* referred to in my paper, and it will be abundantly evident that loyal and intelligent Darwinians would be slow to regard as "unnecessary verbal criticism" my allusion to the new factor alleged :—

> To regulate the changes
> Between Man and Tunicate,
> In the Evolution process
> And the Powers that on it wait!

(6) "As far as I can find out, almost every discovery made in palæontology and other things has tended to fill up the gaps left in Darwin's discoveries."* No weight can be attached to such assertions in the absence of illustrative instances. The author hopes he is acquainted with "almost every discovery in palæontology"; he cannot add "And other things," nor would he like to name all the "gaps" referred to. He is, however, sure that recent discoveries in palæontology do not warrant this statement. But as to, at least, another great gap recently made in Darwin's argument from palæon-

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* A Member writes :—"Probably Lord Grimthorpe did not intend to refer to the origin of man when giving this opinion, as the evidence furnished in the new works of Sir J. W. Dawson, K.C.M.G., F.R.S., Professor W. Kitchin Parker, F.R.S., Professor Hartmann, and others is against any gaps between man and the lower animals having been bridged."—See also the *Journal of the Victoria Institute*, vol. xx. p. 87, *et seq.*—ED.

tology he takes the liberty in this connexion to refer to a paper *On some Darwinistic Heresies*, by Prof. Carl Vogt (*The Annals and Mag. of Nat. His.*, vol. xix., No. 109, Jan. 1887), a most suggestive paper from an unexpected quarter. (7) "The only theistical argument of rational men (!) now is that everything must have proceeded somehow from a Creator. What has natural selection to do with that?" It has to do with it simply because it is asserted to be the "somehow." But those who propose it go a little farther than the critic, and say that the Creator is unknowable. "I think," said Darwin, "that generally (and more and more as I grow older), but not always, an Agnostic would be the more correct description of my state of mind." "I for one must be content to remain an Agnostic" (*Life*, vol. i. pp. 304, 313). (8) "That which we call chance is the result of certain laws of Nature which we partly understand and partly do not understand." What has this vague remark to do with my last paper? I do not think the word "chance" occurs in it. But as it is made much of in the criticism, it may be well to notice the office assigned to it. "I am inclined," said Darwin, "to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance. Not that this notion *at all* satisfies me. I feel most deeply that the whole subject is too profound for the human intellect" (*Life*, vol. iii. 312). The details of designed laws left to the working out of chance! Take an illustration: Man is the outcome of cycles of evolution by natural law! But what of sex? Oh, it is a mere "detail" worked out by "chance." Does my critic think this mechanical hap-hazard quite as much in the lines of common sense, and, as such, of true science, as the alternative explanation,—"He which made them at the beginning made them male and female"? But more, what becomes of the doctrine of special providence? What of the words, "My Father worketh hitherto and I work"? Is there no certain, no sure, knowledge anywhere on these great and vital questions? It will not do to refuse to look at the answer which Revelation gives to them, or to put the Word of God out of court in their trial.

I confess it would have been a disappointment had the other criticisms been in the lines of that which has been noticed. I am,

however, much gratified by the able and judicious critical remarks of the gentlemen whose contributions to the discussion were read by the Honorary Secretary.

NOTE

With regard to the question of nectarines growing on peach-trees referred to in this discussion and in Darwin's *Variation of Animals and Plants* under domestication, vol. i., pp. 357-365:—Being aware that Messrs. T. Rivers & Son, of Sawbridgeworth, were the greatest nectarine and peach growers in the United Kingdom, and that they would be able to speak from experience,—the firm having cultivated the fruit for over a hundred years,—the point was submitted to it. Mr. T. Francis Rivers has most courteously replied as follows:—"The nectarine is merely a form or variety of the peach, and there is no more special difference than between a rough and smooth terrier. I have heard it asserted that a peach-branch had produced nectarines, but this assertion has never been to my knowledge on actual observation, but has been merely hearsay. I have had thousands of trees under my notice and have never seen the fact; it may have happened, but I believe the cause of the variations may be very easily solved, that is, that a bud of a nectarine had been inserted in the peach-branch and forgotten. The variation from seed is frequent, and indiscriminate peaches from seed produce nectarines, and *vice versâ*. I send an example by this post. The peach and nectarine are raised from stones of the Advain nectarine, a very early sort. One can see that the peach is late and the nectarine hard. I have raised hundreds of seedlings with the same result.—Aug. 22, 1888." *

* To those who examined the specimens sent, the skin of the peach appeared less woolly than usual, and with a slight blush of the nectarine in one part.—ED.