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ORDINARY MEETING, MARCH 3, 1873.

MR. CHARLES BROOKE, F.R.S., VICE-PRESIDENT, IN THE CHAIR.

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

MEMBERS :—David Howard, Esq., F.C.S., Stamford Hill ; Theodore Howard, Esq., Bickley, near Chislehurst ; William Dillwoth Howard, Esq., Tottenham.

After which, the following paper was read by the Author :—

THE LAW OF CREATION; UNITY OF PLAN; VARIETY OF FORM. By the REV. G. W. WELDON, M.A. Cantab.

IF I venture to bespeak the indulgence of this meeting, I do so on the plea of the frank admission of my own comparative ignorance and felt insufficiency to deal with a subject which affords scope for inexhaustible inquiry.

2. On some points relating to natural philosophy, a man may speak without incurring the charge of presumption ; but the vain attempt sometimes made to dissect the mighty mind of God as it appears in His manifold works of wisdom from all eternity, leads to conclusions as contrary to revelation as to common sense. On such a subject, even if finite minds were competent for the task, we can only reason in so far forth as the *proven* facts of science, and the unequivocal testimony of Scripture seem as it were to lead us by the hand.

3. With regard to the immediate topic under review, allow me, by way of apology, for selecting one so comprehensive in its application, to observe that anything advanced in this paper is necessarily elementary and suggestive.

4. However feebly the subject may be handled by me, still it is hoped that the thoughts herein expressed may serve, if ever so little, to augment the brilliant and varied evidence which ever waits on the Divine workmanship “to justify the ways of God to man.” If unhappily it should fail in this respect, it possesses at least the merits of having supplied to my own mind arguments for an unclouded belief in the coincidence of a unity of design between the author of the Bible and the

Almighty Architect of the universe. The great Master-BUILDER's plan is as evident in the Works as in the Word of God. Both present as it were a family likeness, which is fitted to illustrate and be illustrated by each other. The same agency in short is at work in the kingdom of Nature as in that of Grace. There are many striking analogies between them. The same loving-kindness, surrounded by equal difficulties—the same unity of purpose, emerging from apparent confusion—the same admirable adjustment of adequate means to merciful and noble purposes.

5. But, after all, how little is man* (even the most accomplished man of science) able to comprehend of the laws of the Great Creator? How true are the words of the ancient Patriarch, who having given some sublime illustrations of creative skill and power, says, "Lo! these are parts of His ways, but who can understand the thunder of His power."

6. On entering the august Temple of Nature we are reminded at every step of the Infinite and the Unsearchable. Hence a childlike spirit of inquiry, and an unaffected acknowledgment of our own incapacity to deal with the eternal laws of the Almighty are the most suitable dispositions for creatures "who were born but yesterday and know nothing."†

7. We are at best only learners and seekers after truth rather than persons really possessed of it.‡ Science and its professors, instead of dogmatizing on insufficient or, as it often happens, inaccurate data, should remember that they are dealing with Divine attributes. In the eloquent and appropriate words of Hooker it may be said—"Dangerous it were for the feeble brain of man to wade far into the doings of the Most High, whom, although to know be life and joy to make mention of His name, yet our soundest knowledge is to know that we know Him, not as, indeed, He is, neither can know Him; and our safest eloquence concerning Him is our silence when we confess without confession that His glory is inexplicable, His greatness above our capacity and reach. He is above, and we upon earth; therefore it behoveth our words to be wary and few."§

8. No one can doubt for a moment the vast body of evidence which glares upon us from the brilliant firmament with which God has surrounded His works and His Word. Eternity will not exhaust the study of it, since it will unfold facts ever new, ever abounding in inexhaustible variety. But yet, even here

* Job xxvi. 14.

† Job viii. 9.

‡ Pythagoras.

§ Hooker's *Eccles. Pol.*, book i. 200.

below, in this the infancy of our being, there are some little portions of light which *twinkle*, as it were, from the analogy between the inspired history of religion and the Divine workmanship in our planet.

This is the subject to which, this evening, I would desire to direct your attention. The main scope of the argument lies in the compass of two words taken from one of Lord Bacon's Essays. The closing words of his *Thema Cœli* are "*Mobilem Constantiam*," which Dr. Whewell, in an article in the *Edinburgh Review* October, 1857, translates, "a constancy that includes motion." Mr Leslie Ellis,* to whose critical acumen we are indebted for rescuing from the chronic inaccuracy of successive editions of Bacon's works this word "*Mobilem*," which blundering transcribers had written "*Nobilem*," renders the words simply "variable constancy." With a view to brevity and the formation of a suggestive mnemonic, I have ventured to mould them into the modified form of—Unity in Variety.

II.—A GENERAL STATEMENT OF THE ARGUMENT.

9. The more closely we examine the Creations of God—the remains of past ages, or the living forms of our own—the more clearly we shall perceive that *the plan is Unity, and the form Variety*,—the one indicating the same Almighty mind, the other that boundless benevolence which knows no rest till in every possible combination it has produced every conceivable form of beauty, existence, and enjoyment. When we look at the works of Creation around us, or read the history of Redemption in the Bible, the first thing that strikes us is the variety of forms in the one, and the diversity of modes of worship in the other. But when we come to examine things more closely—when the eye of Science is directed to the works of the Creator, and the eye of Faith to that of the Saviour—when we strip off the superficial covering, we find that these diversities are only apparent. The groundwork is simple and uniform throughout both. The external variations are adapted to the different conditions of existence in the one instance, and to the varying circumstances of God's people in the other. And

* Ellis and Spedding's edition of Bacon's Works.

thus we arrive at the interesting and important principle of Unity of plan and purpose emerging from apparent contradiction and confusion.

On observing the framework of Creation, we are astonished at the endless diversity of forms and existences of which it is composed. No two things appear to be exactly alike—no two leaves; no two drops of water; no two flowers; no two faces of either man or beast, are in all respects coincident.

10. The productions of Nature are so dissimilar that we might almost fancy that they were created by different orders of beings. But when we view them attentively; when we become better acquainted with their structure, their functions, and their movements, it appears perfectly plain that they were all formed upon the same plan, subjected to the same laws, and have emanated from the same Almighty mind. For example: nothing can at first sight appear more dissimilar than those shining little points called "planets" which wander through the starry sky, and the huge, dark, solid, and apparently immovable mass of matter on which we reside. They are so dissimilar that for thousands of years no person suspected any resemblance between them; but it is now ascertained beyond dispute that they are constructed in the same manner, subjected to the same laws—similar in their nature, their functions, and their movements; thus proving that they have proceeded from the same Almighty hand.

11. The earth and the planets are both globular bodies. They are both illuminated by the same great light. They both turn round upon themselves, producing day and night. They are both carried round the sun; thus making years, which differ only in length. Their axes are inclined to the plane of the orbit in which they move, and consequently they have their springs, their summers, their autumns, and their winters. Some of them, we know, enjoy the same advantages from their atmosphere that we do, and, were we nearer to these bodies, we should undoubtedly perceive many other points of similarity. This tends to supply an illustration of Unity of plan and purpose, emerging, from what at first sight, appears to be irreconcilable diversity and confusion. In our own globe the case is still clearer. New countries are continually being discovered, but the old laws of Nature are always found in them. We meet new plants and animals, but always possessing the same general properties and formed upon the same general mode. We never get amongst such original or totally different modes of existence, as to indicate that we are come into the province of a different Creator, or under the direction of a different will. In fact the same order of things attends us wherever we

go. The stone falls, the sun shines, the air moves, the tides flow, the blood circulates, and in its vast and quiet solemnity the vaulted sky hangs over us. In fact wherever we stand in the glorious creation of God, we see such a general resemblance emerging from apparent diversity, and expressing such uniformity of plan, that we are compelled to acknowledge the same Divine footprints in every corner of Creation.

THE ARGUMENT FROM COMPARATIVE ANATOMY.

12. The inspection and comparison of animated beings gives additional strength to this conclusion. Of all large terrestrial animals, however different in form, the structure is very much alike—their natural functions and passions nearly the same—their vital organs nearly the same in substance, shape, and office. Digestion, nutrition, circulation, and secretion go on in a similar manner, and the solid groundwork or skeleton is plainly made upon the same general model. For example, scarcely anything can appear more unlike than the wing of the bat, the hoof of the horse, the paddle of the whale, and the human hand. But when the integuments are stripped off, when the number and order of the solid parts are examined, when they are subjected to the view of Comparative Anatomy, they are found to consist of the bones of the human hand arranged in precisely the same order, and merely lengthened, expanded, or otherwise modified, to suit the flying, swimming, or pounding motions of the several creatures, and the elements to which they belong. And this law of Unity of plan prevails not less universally throughout the various races of extinct creatures, whose fossil remains are found embedded in the earth. The harmony of structure and design is so complete, that from the character of a single limb, or, even of a single tooth, or bone, the Comparative Anatomist is able to determine the size and proportions of the other bones—the external form and figure of the body—the food, habits, and mode of life of creatures that have long ceased to exist upon the surface of the planet. In a word—whether we discover new countries, or penetrate into distant ages—whether we examine the sparkling heavens, or the mass of matter on which we reside—in every part we find stamped upon the framework of Creation, a Unity of plan and purpose, emerging from apparent diversity and confusion—indicating the same Almighty Creator, and unconsciously illustrating the simple but comprehensive truth of UNITY IN VARIETY.

III.—THE APPLICATION OF THESE PRINCIPLES TO A PARTICULAR CASE.

THE ANALOGY BETWEEN THE INSPIRED HISTORY OF RELIGION AND THE DIVINE WORKMANSHIP IN OUR PLANET.

13. One of the leading objections to the written Revelation of God, is, the careless and confused manner in which its materials appear to be thrown together. There is, it is said by objectors, an absence of that order and regularity which we expect in a literary composition intended to instruct and improve us. We have Psalms, Proverbs, Types, Prophecies, Letters, Laws, Canticles, things mean and things excellent, written by different men of different ages and countries. All these productions are piled upon each other with little or no connection—with a total disregard of that dramatic unity which constitutes the charm of human poetry and prose. Is it possible that the Lord Almighty can be the Author of such a patchwork compilation? Is it possible that He, the God of order and of beauty, from whom we might expect simplicity and elegance in their purest forms, can be the editor of so loose and disjointed a work as this?

14. Now, the way to deal with this objection is to take some acknowledged work of the Creator, and see whether we can discover a family resemblance between its structure and that of the Bible. The crust of the earth on which we reside is, indisputably, the work of the Creator, and it is just such a mass of irregular and dislocated confusion. Its surface is broken up without the slightest regard to what we choose to call *order*. The strata of which it is composed do not lie over each other in concentric circles like the coats of an onion. They have been plainly fractured by disturbing forces, and piled upon each other like pieces of ice which had been jumbled together by a storm, and then frozen together a second time. There are cracks, and slips, and displacements. The richest jewels are embedded in the coarsest materials, and the whole surface is shattered and shoved into every conceivable angle of inclination. Let us now see what the science of the earth tells us of an arrangement, which, superficially considered, appears like that of the Bible to be unsightly disorder. "We shall form a better estimate (says Dr. Buckland) of the wisdom of the confused and complex disposition of the materials of the earth, if we consider the inconvenience that might have attended other

arrangements, smoother and more simple, than those which actually exist. Had the earth's crust presented one unvaried mass of crystal, or granite, or limestone, or had they lain over each other in regular folds like the coats of an onion, only one of these coats could have been within the reach of the inhabitants. And the varied intermixture of sand, and clay, and mould, and limestone, which constitute the soil of agriculture, and are so necessary to the beauty, fertility, and habitability of the field, would have had no place whatever upon its surface. Again, there would be no reservoirs of water admitted through the pores of the earth, sheltered and purified for the use of man. The water that fell being retained under the sun would be soon evaporated; and the rivers not being fed by springs, would rush at once into the sea, and leave their channels dry. Again, the inestimable treasures of salt, and coal, and iron, confined as they are to rocks of unusual thickness, would have been wholly inaccessible, and we should have been destitute of the essential element of industry and civilization. Yes, it is the very disordered condition of its crust which covers the earth with food and verdure, that gives us access to its hidden treasures, and renders it the convenient and delightful habitation of man and the multitude of animated beings with which it is crowded; and he must be blind, indeed, who refuses to recognize the wise foresight and benevolent intention of Him whose works are so manifold, and who, it is justly said, "in wisdom has made them all." So speaks Geology of the crust of the earth on which we live. Now, the similar structure of the Bible promotes spiritual industry, forces us into contact with every portion of its surface, and is one of the sources of that inexhaustible fulness and freshness which distinguish it from every other book. If the Bible were constructed with epic or dramatic regularity, like the poems of Homer or Milton, it would consist of a simple moral and a simple set of characters, easily found, and very soon exhausted. The parts of striking beauty and interest would be known and remembered; the rest would be neglected and forgotten. Here the Truth of God is scattered through the independent productions of men of different ages and countries, giving force to their testimony, because it shows the impossibility of collusion. It is brought into contact with every variety of character and condition; and thus, instead of a simple moral, we have lessons of instruction, wide as our nature, and numerous as our spiritual wants. Here, as elsewhere, the jewels are embedded in coarser and less valuable materials; and as we know where we may find the precious stone which is suited to the spiritual exigency of the moment, we are, therefore, habitually brought into contact with every portion of that Word which the

Lord Almighty has constructed to make us wise unto salvation. Thus the endless number of connections in which the Truth of God is placed in the Bible, and the aptness with which it never fails to meet our spiritual wants and wishes, gives to "its green pastures and its still waters" that peculiar character of life and freshness which renders it another, and yet still the same. Now, if it be so—if it be plain that God in His works does not confine Himself to what *we* call regularity; if His Word be constructed not like the clipped and bordered garden, but with something of the wild luxuriance which distinguishes the works of Nature; if its materials be thrown together with the careless grandeur in which the stars are sprinkled over the firmament, or the flowers over the enamelled field; if it does really resemble the crust of the earth, not only in the apparent disorder, but in the wise foresight, the benevolent intention, and the wonderful and magnificent result—then its peculiar structure, coupled with this result, is so far from being an objection, that it is hardly possible to conceive a more beautiful or decisive proof of its Divine origin.

THE ARCHETYPE AND ITS MODIFICATIONS.

15. It has been well observed by Professor Owen, that "of the nature of the creative acts by which the successive races of animals were called into being, we are ignorant. But this we know, that as the evidence of unity of plan testifies to the oneness of the Creator, so the modifications of the plan for different modes of existence, illustrate the beneficence of the Designer."*

16. In the natural history of the vertebrate animals there is evidence of a common typical structure. That is to say, we have a skeleton, which is, as it were, the model after which all other skeletons have been formed; some presenting a nearer, and some a more remote resemblance to the perfect type. *An original standard with many modifications is the great law of Creation.* The human face is a remarkable instance of this. Our limited faculties can hardly comprehend how, in such a narrow compass, such a variety of modifications, such diversity of lines and lineaments could possibly exist. One can hardly realize

* Orr's *Circle of the Sciences*, No. 2.

the fact, that a Cherokee Indian—a Soudan Negro—a native Australian—a Mongol Tartar, and an Anglo-Saxon can all be descended from a common parentage. And yet, when we come to examine things more closely, there is no greater difficulty in believing in the unity of the human race, than in the variations of plants and flowers, propagated from the same seed-capsule, as seen especially in the case of orchids, to which I shall refer in the sequel. We are distinctly told that, “by the Sons of Noah were the nations divided in the earth after the flood.” It would require a considerable amount of the most unimpeachable testimony to set aside this plain declaration of Scripture. As yet; nothing approaching to reliable evidence has been adduced to negative the Mosaic record.

17. The present manifold variety of the human family appears, at first sight, to present irreconcilable difficulties and confusion; yet, that confusion is merely *the unknown intermixture of laws*, and if we were in a position to understand the whole of the case, the problem that all human creatures now living have descended from a single pair, and from a common type, might not seem so difficult of solution. That the fact is so, we simply believe, not only from the declaration of Scripture, but from the analogy of Nature.

18. The great Archetype of creative skill on earth is—*Man*. During the long succession of ages that preceded him, all the creatures that existed upon the globe were gradually coming nearer and nearer to the perfect type which, in the counsels of the Most High, was to wind up the series when man appeared. The four ages of Nature may be classified as follows:—

1. The Reign of Fishes.
2. The Reign of Reptiles.
3. The Reign of Mammals.
4. The Reign of Man.

19. During the first age, *Fishes* were the masters of creation. Then the air-breathing animals were very few. During the second age *Reptiles* assume the chief place and authority over the other classes. The air-breathing animals were more numerous. During the third age terrestrial animals of colossal dimensions abound, and then the *Mammals* obtain the mastery, and occupy the most prominent position. Finally, comes the chief work of the great Master-Builder, the most perfect of all created beings on this earth—for whom all the others were merely preparing the way—*MAN!* All the creatures that came before man were so many symbols, as it were, of the future model after which by anticipation they were already

formed. Man, in fact, was the consummation of the vertebrate type. "It is evident that there is a manifest progress in the succession of beings on the surface of the earth. This progress consists in an increasing similarity to the living fauna, and among the vertebrata, especially in their increasing resemblance to man. But this connection is not the consequence of a direct lineage between the fauna of different ages. There is nothing like parental descent connecting them. The fishes of the Palæozoic age are in no respect the ancestors of the reptiles of the Secondary age, nor does man descend from the mammals which preceded him in the Tertiary age. The link by which they are connected is of a higher and immaterial nature; and their connection is to be sought in the view of the Creator Himself, whose aim in forming the earth, in allowing it to undergo the successive changes which Geology has pointed out, and in creating successively all the different types of animals which have passed away, was to introduce Man upon its surface. Man is the end towards which all the animal creation has tended, from the first appearance of the first Palæozoic fishes."*

20. The succession of animals on the surface of the globe, and their distribution, opens up to us a wonderful and magnificent idea of the Divine workmanship. Thousands of years before that plan was developed, the minutest details of it were foreseen, and, in some instances, announced. He, who alone can see the end from the beginning, and in whose sight a thousand years are as one day, is alone capable of understanding or explaining the necessary relation of each part to the whole, and the special ends which they fulfil. For example—the vast stores of coal, granite, marble, salt, iron, silver, and gold, thousands of years ago were laid up in the bowels of the earth, and remained there until the proper moment had arrived for their utilization. Those inexhaustible provisions for the necessities of man, and for the development of his inventive and intellectual faculties, clearly betoken the providence of God ages before the appearance of the human race upon the earth.

21. The creation of man was not an afterthought. It was one of the facts fixed in the counsels of the Most High, from all eternity. And when the time came round in the revolution of ages, for the entrance of man upon his predestined habitation, he found that everything had been settled for him in advance. No person can look into these arrangements without seeing the clearest indications of design. "The recognition of

* Agassiz and Gould's *Comparative Anatomy*, sections 689, 690.

an ideal exemplar in the vertebrated animals proves that the knowledge of such a being as Man must have existed before Man appeared; for the Divine mind which planned the archetype also foreknew all its modifications."*

22. This working up to an exemplar by anticipation is beautifully illustrated by the whole arrangement of embryonic existence. Here we find the circulation of the blood carried on by an arrangement adapted to the peculiar circumstances of the case. At birth the pulmonic and systemic circulations begin to operate for the first time, but all the machinery for their efficient working had been carefully anticipated.

23. The first breath of atmospheric air closes, or ought to close, the foramen ovale which for ever draws an impassable boundary between the pre-existing and the present life.

24. Thus we see that the pulmonary and respiratory processes were all prepared by anticipation, and that, at a time when it would have been impossible to use them without instant destruction to life. On this smaller but exquisitely wonderful adaptation we have the same unity of plan and variety of form in the mysterious origin of animated beings as compared with the protracted preparation of the globe itself for the reception of the human race, and its tributary dependants. Everything here, as in other respects, had been pre-arranged with far-seeing accuracy, and, when the appointed hour had come, the predestined occupant of the earth found everything ready to his hand, according to the position of the creature and the exigency of the period.

But there is something more than mere adaptation. We have also intimations of such a unity of plan, on which the whole of nature is constructed, as suggests the notion of some pre-existing idea, as it were, in the mind of the Creator, of which we trace the reflection in the works of His hand. In each division of animals there exists a definite type, the essentials of which are never violated, even when it seems in a manner incompatible with the habits of particular animals—the necessary conformity being obtained in such cases not by a departure from the type, but by a comparatively slight modification of some parts of the organization, in a way quite consistent with its general character. The organic creation is obviously constructed upon a great systematic plan—not like an overgrown village in which the houses are scattered about without any order, every man having built according to his own fancy—but rather like a well-planned town, with houses in

* Professor Owen.

regular streets, in each of which a certain uniformity prevails; while the streets themselves are arranged according to that particular order which the founder of the city had previously anticipated and designed.*

THE PHILOSOPHY OF LAMARCK AND HIS DISCIPLES.

25. Wise and merciful forethought, which provides an adaptation of means to meet the wants of the creature, is a truth pencilled with light through every department of the Divine handiwork.

This universal principle, so beautifully illustrative of the ever-present superintendence of God over His works, produces an ardency of expectation in His creatures which enables us to believe everything not incredible, and to hope for everything not impossible. Therefore intelligent believers in the Divine authority of the Bible are of all men the most Catholic in their recognition of scientific progress and the least dogmatical upon the unsolved problems of creation. For they know that there are difficulties as far above reason as reason is above instinct, and also that He who in the riches of transcendent wisdom arranged the Divine history of the Bible has also arranged the constitution and the course of Nature. We may therefore look calmly on the discoveries of modern science, for it must be evident that truth can never be opposed to truth. So that the facts of Natural Philosophy, instead of being opposed to the truth of Scripture, must of necessity be proofs and illustrations of each other, and of the variegated goodness of God, and, in coming from our minds, form kindred portions of one great whole.

26. The only limit to our belief is the impossible. This is that border-land where the war of words begins. Yet even here we are not left to blind conjecture. Wanton fate does not sport with the universe as the disciples of Lamarck would lead us to suppose. From facts already known we can make progress towards facts yet unknown, but as finite creatures we are gently and mercifully reminded at almost every stage of our inquiry that the infinite and unknowable is immeasurably above our reach, and lies in the boundless horizon beyond us. For want of this modest deference to the will of

* Ogilvie on the *Principles of Organic Architecture*.

our Great Creator some men have rushed desperately to conclusions, unworthy of true science, dishonouring to our Almighty Maker, and at variance with common sense.

27. The philosopher Lamarck and his more modern disciples in the Darwinian school of thought, undertake to account for the origin of things in Nature. Setting aside the plain statements of the Bible, which represent God not only as the Great Creator, but as the eternal Distributor of all things, they tell us that the laws of Nature are in themselves executive, wholly irrespective of the Almighty, except, perhaps, in the creation of the original plasm. The Divine Being is thus excluded from His works, and this, I need hardly say, reduces Him to a kind of moral nonentity! Thus the Creator (if even acknowledged to be such) is placed in solitary grandeur, according to the philosophy of Epicurus, looking down as it were at the progressive development of His plan, from the potentially endowed plasm in the far, far distant past, till it assumes, after countless and ill-shapen transmutations, His own Divine image and likeness! This theory runs directly counter to the principle of unity of design, traceable in all the works of God. It is, in fact, the deification of Matter.

28. But let us apply the principles to a particular case. Lamarck endeavours to account for the extreme length of the neck of the giraffe, from the fact that it is a creature of circumstances. He tells us (how far back he does not say) that originally the length of its neck was not greater than that of the elephant. But the giraffe having to obtain its subsistence from the leaves of trees, high up out of ordinary reach, saw indeed the tempting morsel but knew not how to seize it. It was this that suggested to the animal a series of vigorous and well-directed jerks, until in time the vertebræ became gradually extended. Each succeeding race of giraffes left to its immediate posterity a legacy of elongation, till in the lapse of ages we find this creature of circumstances the architect of its own fortunes.

29. In like manner it is said that water-fowl originally were not endowed with web feet. They were like the common hen, but being creatures of circumstances, and having to seek their food among the reedy banks of lakes and ponds, the instinct of self-preservation evolved those necessary movements of the feet and legs, which in process of time terminated in the production of web. Now there is not a single particle of proof for all this. It is based simply on conjecture, and we are asked to accept it as the best conceived idea of the origin of the present state of things in the world around us, so far as it relates to the analogy between plan and form.

30. Not less incredible, and equally unsupported by facts, is the theory of evolution, as propounded by Mr. Darwin, but in which he was preceded by Lamarck. A little nomad becomes a monkey—a monkey develops into an ape, and the ape into a man! The wonder to my mind is why the principle should have failed to operate for so many thousands of years. Was it only a limited liability? If not, why should we not now see instances of this progressive development?

31. There are at least two facts fatal, in my opinion, to this theory. One is the Deluge, of which we have lately received proof on testimony irrespective of Scripture. The other is the fact that the world will one day be burned up by the agency of fire. This, of course, is a matter of faith, resting solely on Divine testimony.

32. The difference between special creation and the theory of evolution is just this. A belief in the supernatural is essential to the narrative of Scripture; a belief in the fortuitous course of atoms operating by inherent power, and will, and wisdom, is essential to the acceptance of evolution by natural selection. The statements of the Bible are founded on the fact that God is the Almighty Sovereign of His creatures—that He can alone create, and He alone destroy—that He is the present mover as well as the original maker, and that through every corner of the universe "He giveth [that is, *is giving*] to all life, and breath, and all things." (Acts xvii. 25.)

Mr. Darwin and Lamarck withdraw the Creator from the constant superintendence of His own laws, the execution being vested in the laws themselves.

33. There can be no doubt that the love and wisdom of God are displayed by what we call laws, but to suppose that they possess intrinsic powers of action irrespective of the constant vigilance of the Lawgiver is a form of materialism unworthy even of the dim lights of Pagan philosophy. It has been eloquently observed by Professor Balfour, that "we cannot but honour the man, who, by his genius and talent, has been enabled to develop one of the great laws of Nature, and who feels, and acknowledges that he has been the humble instrument to lift the veil, to a certain extent, which conceals the working of the Almighty; but we have no sympathy with that discoverer in science, who, puffed up with intellectual superiority, puts the laws which he has elucidated *in the place of the Creator*, whose personality had ever-working Omnipresence he ignores."*

* *Manual of Botany.*

34. The destruction of a whole genus, as in the case of the Ammonite, is also a difficulty in the progressive theory. It is an undoubted fact that there was a period when the Ammonite and the Nautilus co-existed. In the earliest formations the Ammonite is found side by side with the Nautilus, up to the chalk. Not a single specimen of that genus has ever been since found in deposits which overlie the chalk. How can this total extinction be accounted for in the Darwinian and Lamarckian philosophy? It is in point of fact an unsolved problem, which no human mind can explain, or possibly in the present state understand.

We believe that all creatures on earth at the present time have never varied in their general features, and that they are to-day what they have ever been since their original creation. The first giraffe had a neck as long as those now living, and the first wild duck had its feet webbed just as those of the present day. That they were otherwise formed remains to be proved. All things continue as they have been since the creation of the world, allowance being made for such external changes as take place from climate, food, domesticity, and such-like.

THE PRINCIPAL VARIETIES OF MANKIND.

35. Such varieties as those of the Negro—the North American Indian, and the Anglo-Saxon seem difficult of explanation under ordinary circumstances. But I do not see anything more perplexing than in the facts connected with the history of orchids. From the same seed-capsule great varieties of plants are produced. It is peculiarly deserving of notice that on the very same plants, you will find two totally different sets of flowers. This is a serious difficulty on the Darwinian principle.

36. The question of colour or pigment, as in the case of the black man or the red man, is one about which physiologists as yet know little or nothing. It is well understood that very remarkable changes are effected by food. For example, if a pig fed on madder for six or seven weeks be killed at the end of that time, it will be found that his bones have become pink.

There are hundreds of questions involved in this variety of the human species with which we should be thoroughly acquainted before we presume to deny the Scriptural account of the origin of man. Nothing that I have yet read upon the

subject has in the least shaken my faith in the traditional and inspired narrative about Adam and Eve.

37. Nothing perhaps ever went nearer to disturb my mind on this subject than a month's ramble amongst the Digger Indians of California. Whatever may have been the experience of Mr. Darwin among the Fuegians, I can probably say it could not have been productive of more painful imaginings than mine among the Indians of California. A well-grown gorilla would present less repulsive features and a more pleasing, because a more consistent, bearing. Instinct unfettered makes the brute natural, whereas reason dethroned makes the man brutal. It deforms and degrades him, because it is a deviation from a natural law. Human creatures of the finest form who from to-day should begin to live, as those Indians do, on acorns and earth-worms cooked in the roughest fashion, would not long retain traces of noble mien; and in a few generations it is not too much to affirm that the race would undergo changes which, from our inexperience we can hardly conceive. That the Digger Indian should be a fellow-creature sprung from a common ancestor—a man and a brother—is certainly a humiliating fact in the history of moral and physical degradation. But it can furnish no argument against the unity of the human race. It is the penalty of deviation from the original model, and gives proof that some disturbing force has marred the great masterpiece of creative skill. It is a well-known fact that physical degradation is intimately connected with moral degeneracy.

38. This gradual departure from the standard of moral rectitude may go on increasing from age to age till man has lost almost every vestige of his high origin. It is not necessary to trace the Fuegian savage from some primordial plasm, in order to account for the low type of his moral and physical nature. In our own country we have specimens of the human brute to my mind quite as loathsome as the lowest forms of heathenism. All that I contend for is, that amid the varieties of the human species, there is a unity of plan which links men together in a common brotherhood, however distasteful it may be for us to recognize our poor relations. One temperature of blood throughout the earth, 98°—an uniform system of circulation—the same sets of muscles, veins, and arteries—the same convolutions of the brain—the same span of life—the same processes of decay, and the same sad symbol of weakness and corruption presented by the mystery of death. In many other respects the family likeness is easily traced, and the resemblance of man to man, though isolated from each other by sea and land, is only too obvious. The plan is Unity, the form is Variety.

ARGUMENT FROM BOTANY.

39. The argument of Unity amid almost endless Variety finds an appropriate and interesting illustration in the science of Botany. Here the connection between plan and form is replete with many and striking coincidences.

From the Lichen on the Alpine summits, to the despised weed of the same order on the coral reef—from the parasitic fungus, visible only by means of high microscopic power, to the enormous parasite * in the Indian Archipelago—from the sweet-scented vernal grass “in the dewy paths of meadows,” to the tree-like branching bamboo of tropical climes, there are many varieties in form but only one plan. No man, at first sight, could believe it possible that the common meadow-grass and the sugar-cane are members of the same family. And yet the fact is so. The varieties in the order of grasses (*Gramineæ*), however apparently dissimilar in form, are all alike in their general features.

40. Of the three hundred and twenty genera, including three thousand eight hundred and fifty species, whatever variety may exist as to the number and form of the different sets of bracts, and the nature of the fruit, there is only one arrangement throughout the entire family, which gives to it that unity of plan, whereby they are recognized as belonging to the same order. Wheat, oats, barley, rye, rice, maize, Guinea-corn, millet, &c. &c., which supply “green herb for the service of man,” and the rye-grass, meadow-grass, sweet vernal-grass, cocks-foot grass, Timothy-grass, and countless grasses besides, which “give food for the cattle,” are all members of one wide-spread family. They present the same peculiarities of organization and structure, however separated by continents and centuries. And, that which holds true with regard to the variety of the family of grasses, is equally true in the case of the other orders. There is the same Variety of form, the same Unity of plan.

 THE CONSTITUTION OF THE HUMAN MIND.

41. Difficult as it is to see two human faces that exactly resemble each other, it is far more difficult to find two human minds that see everything in the same light.

“Facies non omnibus una,
Nec diversa tamen”—*Ovid, Met.*, b. ii. 13.

* *Rafflesia*,

The varieties of our mental structure are boundless, and these varieties give a peculiar shape and colour to our opinions. We cannot induce men to think alike on everything. They will not consent to suppress their sentiments. That this does, indeed, arise from the nature and the free action of the human mind, is evident from the fact that it takes place in every department of knowledge. In science, in literature, in law, in morals, in medicine, in politics, even in the theory of light itself, there are little *undulations* of opinion, producing differences and debate. In the substance of these things all reflecting minds are agreed, but, in the execution and the details, there is room for a variety of opinion, and a variety of opinion takes place. There are hundreds of questions left under the guidance of general principles and regulations; and it were absurd to suppose that men of every age and caste and character should all embody those principles without variation in their colour or their form.

THE POSITIONS WHICH THE BIBLE OCCUPIES AS AN AUTHORITY ON NATURAL SCIENCE.

42. I cannot draw my subject to a close without noticing the position which the Bible occupies in the conflict of opinion between rival schools of philosophy.

There is a quiet scepticism among the disciples of one party in regard to the literal teaching of Scripture on the subject of natural science. It may be well to remember that the Bible was not written to teach us the motions of the stars, or the natural history of our planet, or the rules of criticism, or the details of history. It was written to teach us "the one thing needful." And so intent is its real author upon this its real object, that while the meanest and minutest circumstance connected with that "one thing" is fully and freely noticed—the mighty monarchs and the splendid empires of the surrounding world are passed in almost total silence by, unless when their edges happen to come in contact with the history of God's glory and man's salvation, after which they sink back into the obscurity out of which they had emerged for a moment. The main object of the Divine Author of the Bible was not to write a book on Natural Science, but to place man's peace, and hope, and holiness, in every stage of its growth, distinctly before his eyes. And this He has done in the most brilliant evidence that ever was presented to the mind of man.

43. Another mistake into which persons are sometimes apt to fall in reference to the Bible is to imagine that the expressions applied to the works of Creation are to be taken in their strictly literal meaning. Now, it should be remembered, that the language of the Bible is not the language of science, but of *common sense*. And we need not go far to account for this. For, if it were written in the technical phraseology of physical science, there would be very few comparatively to whom its language would be intelligible. Take, for instance, the descriptions of the sun, when it is said to "rise" and "set," or, as in the case of Joshua, where it is said miraculously to "stand still." These words convey to every human creature on the surface of the globe the very same idea. Whether he be a New Zealander, or an inhabitant of Labrador, or of England, or of the Caucasus, all are agreed on the fact, which appeals directly to their senses; and for all practical purposes this is quite sufficient. But if the real state of the case were scientifically put before them, it is not too much to affirm that, with few exceptions, as in the case of learned men, all the rest of the world could not possibly understand, much less believe, the facts when clothed in the garb of science. This was not the object of the Bible, and hence the sacred writers adopted the current phraseology, and in the current popular meaning, whenever they had occasion to allude to natural phenomena.

44. To make known the One and all-sufficient Atonement for the sins of a world in wickedness was the *primary* object of the Bible. Hence Natural Science does not form any direct department of Revealed Truth. Beyond certain general statements in reference to the formation of *Man* and *Matter*, we have no special information to guide us on the subject.

CONCLUDING REMARKS.

45. The application of the principle of Unity in Variety is as extensive as the creation of God. We have pointed out its existence in the constitution of the human mind—in the structure of the body—in the formation of our globe—in comparative anatomy—physiology—botany, and if the time and place permitted, we could also show the same principle existing in the various modes of Christian worship, and the different administrations of religion. The principle is as generous as it is ennobling. It shows us the ever-present working of an Infinite Mind. It exhibits the unwearied benevolence of the Great Creator, and the boundless horizon of

His immeasurable glory. The subject is worthy of a better fate than it has met with at my hands. But by way of excuse I may say in the words of Lord Bacon, "These things have I in all sincerity and simplicity set down * * * * and that without any art and insinuation * * Notwithstanding I trust that what hath been said shall find a correspondence in their minds which are not embarked in partiality, and which love the whole better than a part; wherefore I am not out of hope that it may do good; at the least I shall not repent myself of the meditation."*

The CHAIRMAN.—I am sure all will join with me in returning sincere thanks to Mr. Weldon for his very excellent paper. (Cheers.) It is now open for any present to offer remarks thereon.

Rev. G. CURREY, D.D.—I am quite sure that no one can have heard Mr. Weldon's paper without being struck with the great force and beauty of its language, and the manner in which it has commended its arguments by the skilfulness with which they have been put. (Hear, hear.) I am certain it must have given all present as much pleasure to listen to it as it has afforded me, and I beg to express my sincere thanks to the author for having set forth the truths he has put before us, in so very able and attractive a form. In offering a few remarks upon the paper, I desire, however, rather to draw attention to those points on which I think something might be supplied, than to continue to commend what is so well worthy of our commendation. In the general argument employed by the writer of the paper I, for my part, thoroughly concur. There was one point to which I would draw attention in the portion of the paper that deals with the principal varieties of mankind. It seemed to me that there was some difficulty with regard to the statement, that the objection to the notion of the present varieties of man being traceable to one pair, is answered by a method of degeneration which accounts for the alterations that have taken place as compared with the original type. The point which requires the greatest amount of attention and care in prosecuting an investigation with respect to the varieties of mankind, is, not so much the question of degeneration, as the marked and distinctive character of each variety. It is not simply that we find there are men who have fallen into a state into which we may suppose their savage or peculiar mode of life has brought them, so that they are now very far removed from the highest type seen in other places, as it is, that we are brought into contact with distinct varieties, each of them capable either of development to a higher state, or of a corresponding degradation to a lower state. It will be enough to refer to the three great distinctive varieties, as Cuvier defined them—the Caucasian, the Mongolian, and the Ethiopian or Negro. There are, as is well known, in-

* Bacon,

dividuals belonging to the Negro type, who have attained to a very considerable degree of superiority over other portions of the same race, while there are others who, on the contrary, have sunk very low. The same remark may be applied to the other races. The difficulty to my mind is that, from whatever point of view we regard them, whether as improving or the reverse, these varieties are always clearly and distinctly marked, and have been able to preserve these characteristics, and this distinctiveness, through so many successive generations. When we go into our museums and see what is depicted on the ancient monuments and sarcophagi of Egypt, we find that the same type of the negro and the same types of other peoples were in existence thousands of years ago, as those which are met with at the present day. (Hear, hear.) I have no doubt myself, and I think that the evidence from all sources proves, with sufficient clearness, that all these varieties have descended from one pair;* but the difficulty is how this marked variation has taken place, and why it is that, having taken place, it should continue with so much constancy, spread as the different varieties are all over the world, and preserving throughout so much uniformity in variety. This uniform variety of distinctive Types has been scarcely touched upon in this paper. Of course the writer could not, within the limits assigned him, have gone into all the details connected with the numerous subjects he has touched upon, but in hearing him mention the variety of forms in which the human race is found, I had rather hoped to have heard something with regard to these fixed lines of division—this definite and persistently maintained subdivision of the human species, which enables us to see this or that type prevailing uniformly, age after age, in various countries. Throughout the different varieties, and in every case where we find either higher excellence, or positive degradation, there is in each type the same uniformity, constant and unchanged. More accurate and extended observation has found other types besides those which I have already mentioned. Through many generations, many thousands of years, these types have continued; and so far as we can look back,—so far as the evidence of monuments goes,—we find no trace of the variation becoming less marked; on the contrary, it is as much marked on the very oldest monuments of Egypt as it is in the present day. Now, although I wish it to be understood that I am not in the least doubting the fact of our common derivation from a single pair, I cannot help seeing that this is an argument, so far as it goes, in favour of there having been a separate origin, in the same way as we use the argument against the Darwinian theory, that we cannot see any traces of change from the giraffe to the cow. I think the fact I have pointed out requires a good deal of consideration. One thing to which it points, is the great antiquity of man. It seems to me that when we look at the length of time during which no variation has taken place in the several types of humanity, the evidence thus furnished does

* This conclusion is also Professor Huxley's. [ED.]

open our eyes to the necessity of allowing a far longer period to have intervened since the original creation of man than is usually assigned ; at any rate, I can see no other way of accounting for the circumstance I have pointed out. We know, with regard to the chronology of the Bible, that the period which has been deduced from it is not at all probable, and it is a somewhat unfortunate circumstance that we should have been taught that which has been commonly accepted in reference to the Bible chronology, because many people have made it a matter of faith to such an extent that they seem to think we are destroying the Bible itself if we throw aside this chronology. Nevertheless, this is a conclusion to which the long-preserved variety of type among mankind seems to necessarily point—viz., that man has existed for a very much longer period of years than can be ascertained from any system of chronology with which I am acquainted. I thought it might be interesting to the meeting to open up some subject of this kind which had not been specially discussed in the paper ; and I would suggest, for the consideration of its author, the definite lines in which the variations of mankind have taken place, and been so long preserved. I may add that I did not quite understand what was said on the subject of botany. In speaking of grasses, such as wheat and the different varieties of grain, being of the same family, I did not understand whether the author used the word family in the same way as when he speaks of the different varieties of mankind being of one family, or whether he supposes that each of these varieties is what may be termed a distinct creation.

Mr. WELDON.—I meant in the ordinary sense of order.

Dr. CURREY.—But it would seem to be put in the same way, as we have different varieties of the human race, all coming from one species, so, by analogy, we might suppose that all the varieties of grasses came from one stock. This has not been really touched upon, and it is not necessary that it should be determined at all. I have, perhaps, said enough to lead to open up some points of interesting discussion ; and I would direct especial attention to that part which strikes me as being especially interesting—viz., the question as to the varieties of mankind ; the definite lines in which those variations have been maintained ; and the long period during which they have occupied precisely the same lines and no others. This seems to me to be a different kind of variety from the variety which arises from individual degeneration.

Rev. C. A. Row.—There have been few papers read in this room to which I have felt able to give a more cordial approval than to the one we have heard to-night. In fact, there is only one sentence in it with which I dissent as conveying what I conceive to be an untrue statement of fact ; and that is the passage respecting the testimony to the historical character of the Deluge, supposed to be derived from the recently-discovered stone inscription. After reading the accounts of that discovery as they have been published in the newspapers, I cannot see that it affords *historical* testimony to the occurrence of the flood. To me it seems to prove that

there was, at the time the inscription was written, a universal tradition that a deluge had taken place ; but when you come to read the inscription carefully, you will find that the story of the deluge is placed among the category of myths. The point therefore is, that the whole account, so far as its historical value is concerned, is based upon the testimony afforded by a number of myths. All that the inscription shows is, that there was a story prevalent at the time it was recorded, which bears a certain analogy to the narrative in the Scripture. This is the only portion of the paper to which I take exception. I should however say, that if there be any other failing in the paper it is its excessive brevity. I am afraid the author must have been induced to make the paper so short, by the strong clamour which usually prevails against long sermons and lengthy papers. One point that has produced a feeling of regret in my mind is, that the author did not carry out, at greater length, the analogies which exist between the gradual development of creation and revelation. I think that if this were done, carefully and well, by some man of enlarged mind, it might be made a point of Christian evidence, as important as any that can be obtained. The principle is here affirmed clearly enough, and it is a matter of regret to me, that the author has not enlarged his paper to double its present length, and pointed out the various analogies which exist in the Bible, and which, to my mind, contain the fullest proof that the Author of the one order of things, is the Author of the other. (Hear.) I shall not attempt to repair this omission, because I am well assured that no one could do this properly in an extemporaneous address. It could only be done pen in hand, for on such a subject it is important that nothing should be said that has not been fully considered. I will, however, draw attention to a few points, without endeavouring to treat them definitely, or distinctly. The paper draws attention to the fact that there is an enormous variety in creation—that creation is, to use a very expressive phrase, “many-sided”; and in the same manner the Bible is many-sided, and I should have been very glad to have seen this many-sidedness of the one, paralleled directly by the many-sidedness of the other, in which case the paper would have possessed the highest value. Let us take an example or two of this many-sidedness. I will refer to § 18 of the paper, where the writer treats of the fourfold reign of fishes, reptiles, mammals, and man. This is the order of creation. Let us see whether there is any similar order in the Bible. I assert that there is. In the Bible you have various forms of revelation, passing through a succession of phases beginning with the Patriarchal dispensation, going on to the Mosaic and Prophetic dispensations, and finally culminating in the Gospels. Here, at any rate, you have an analogy between the mode of working of God in creation, and of God in revelation. Let us take, again, another remarkable circumstance alluded to in the paper—viz., the great variety of view which the human mind takes of various subjects. We see precisely the same fact in nature and revelation, from one end to the other. Take what must strike every reader of the New Testament. Fully admitting that there is a oneness

of type running through revelation, yet it so falls on men of diverse characters, that we do not all of us see it alike. We have in the New Testament itself three or four most striking instances of this. There can be no doubt that the Christianity which is taught by St. Paul, St. James, St. John, and St. Peter, possesses the same spirit which runs through their teaching; nevertheless, it would be vain to deny that there is a great variety contained in that unity. It is impossible to avoid seeing that some of these writers seem to view Christianity from a somewhat different point of view. This paper brings before us the many-sidedness of creation and revelation, and the folly of taking very narrow views of divine revelation—of supposing that our own limited ideas afford the only adequate mode of considering revelation. As Dr. Currey has well and ably pointed out, in respect to the general varieties of mankind, we may see that Christianity, speaking from a historical point of view, is applied in many forms, and thus is suited to every variety of the human mind. Admitting that the human mind appears in an immense variety of aspects, and starts with different modes of conception, it seems plain that Christianity has been modified—and in saying this I desire to include the whole Bible—so as to adapt it to all the various phases of the human mind. Let us take, for example, Germanic Christianity, and by this I mean that type of Christianity which the great German writers have accepted; and we see one grand type of Christianity. Another type of Christianity is that which has been accepted by the Greek writers, and it is of a very different kind from that I have just mentioned. There is another type of Christianity which has been accepted by the Celtic writers, and this is very different from either of the other two. I do not know whether I might not greatly enlarge upon this topic; but at any rate, what I have said will serve to draw attention to this great fact, that as creation is many-sided, and may be viewed in so many different aspects, and under so many different characters, so, in the same way, Christianity and revelation are also many-sided, and as wide as man himself. Therefore, it seems to me that it has been a great mistake to look upon this subject from too limited a point of view. We have been too apt to set up our own creed as the only right view of things, and to put down everybody else's creed as wrong; and in doing this, I think we have been guilty of overlooking the wide foundation of natural and revealed religion. There are one or two passages in the paper to which I will draw attention as containing points on which I most entirely agree with the author. In § 32 he says, "The statements of the Bible are founded on the fact that God is the Almighty Sovereign of His creatures; that He can alone create, and He alone destroy." This is a great and profound truth, and one which we are often tempted to ignore. We are, I think, too often in the habit of laying it down that many of the peculiar structures of the animal creation have resulted, not from the act of the Divine Being, but from the fall of man. It seems to me that this is a very dangerous assumption. I fully admit that there are certain forms of animal life, the peculiarities of which one cannot but wonder at exceedingly, and which, looking at them in the

abstract, one would not have referred to the Creator, but which we might be disposed to trace to an entirely opposite source ; and in precisely the same way, we find in the Word of God things which, if also viewed in the abstract, we should not have thought could have proceeded from the Almighty mind. In fact, it seems to me, that as far as creation is concerned, it is very much a question as to what mode the Creator has adopted in His creative acts. We know that even in these days the Creator may, in some degree, be said to be creating, as, for example, when He heals a wound. If any of us had a leg cut off, we know that the wound would heal ; the flesh and skin would grow over the place of amputation, and in process of time the part would be well and sound. How, it may be asked, does the Creator act in this? Why, by an instrumentality no one would ever have expected. The only power He uses is that which is afforded by an artery or a number of arteries—at least, this is the only visible power at work, and by its means He effects the wonders we so frequently witness. So, in the same manner, He may apply a mode of evolution as the mode of His creation, as He does in creating each individual man and woman. The only thing we have to do, is to believe that the Creator is not separate from the law ; but is operating in 'it, and ceaselessly engaged in the work of creation by His boundless power and His mighty providence. (Hear.) But when we are told that creatures develop themselves by a process of self-evolution, we are asked to believe what seems to be the most extraordinary fallacy that ever could have been conceived by the mind of man. It is certainly a great tax on our credulity when we are asked to accept the theory that the giraffe, by a series of self-evolutions, governed by a particular set of laws, which exist, and are entirely apart from the power of the Lawgiver, has been enabled to elongate his neck to the extent he has attained, and, to my mind, the proposition is so irrational that I think it impossible seriously to entertain it. And yet I cannot see but that the great and Almighty Creator may act by any law He pleases, and in such a manner that we may have no conception as to what is the law by which He does the work of creation. I regard the paper we have heard to-night as a valuable one, inasmuch as it has drawn our attention to these enlarged views of Christian revelation, and to its many-sidedness. The more we study, the more we shall find that as it is in the Christian revelation, so is it also in the natural creation of Almighty God, and *vice versa*. If we can show that the one is the counterpart of the other, I hold that we shall have got rid of every possible objection which can be made against revelation, leaving to those who consider the subject, the simple alternative of atheism or Christianity.

Mr. J. E. HOWARD.—I must express my great admiration of the paper which has been read to-night ; and in saying this, I know that I am giving utterance to a sentiment that prevails throughout this meeting. With regard to what has been said as to the varieties of the human species, as shown by the oldest records on certain monuments, I think that the argument adduced in support of the extreme antiquity which has been claimed

for man, ought not to be allowed to go unchallenged, as though that argument had necessarily been proved. The question of the different races of mankind is one which I think might very appropriately occupy the attention of such a society as this. It is one which has been exceedingly well discussed in France, where much and patient research has led to certain conclusions with regard to the differences between species and races; and if you will permit me, I will put before you what has been said by one of the leading French naturalists—M. Quatrefages. He states:—

“The species is the collective amount of individuals more or less resembling each other, which are descended, or can be looked upon as descended, from one primitive pair by an uninterrupted and natural succession of families.

“The variety is an individual, or a collection of individuals belonging to the same sexual generation, which is distinguished from other representatives of the same species by one or more exceptional characteristics.

“The race is the totality of individuals belonging to a single species having received, and transmitting by way of generation, the characters of a primitive variety.

“Thus the species is the point of departure. In the midst of the individuals which compose the species appears the variety, and when the characters of the variety become hereditary they form a race. These are the relations which for all naturalists reign between these three terms, and which it is necessary to have constantly before the mind in the study of the questions which occupy us.”

From hence it follows that the notion of resemblance, which is very much attenuated in the species, becomes of absolute importance in the race. The union of individuals of different species is very rarely productive. It is quite otherwise with the union of individuals of the same species, but of different races. Here, however opposed the morphological characters may be, the union is easy, and always fruitful, and they transmit to their descendants the reproductive faculties which they themselves possess. These facts are admitted by Darwin, although opposed to his doctrines. It would, of course, follow that the human species is but one, because all the races are thus fruitful; and it would also follow that varieties having sprung up, perhaps suddenly, may become distinct races. This is proved most completely as regards both plants and animals. The question of time is not a matter to be considered as regards the formation of a variety: it may occur suddenly, and may then be transmitted so as to form a race; and races so produced, according to the view of M. Quatrefages, may go on propagating themselves. I do not wish to take up the time of the meeting on a point going beyond the question that has brought us together, but I have thought it right to direct attention to an argument which certainly ought not to pass without challenge—namely, that the different races of mankind necessarily prove anything as to the length of time man has occupied a place on the globe.

Rev. JOSIAH MILLER.—I should like to offer a few remarks in addition to those to which I have already listened with so much pleasure. It struck me in hearing the paper which has been read to us, that, although it is an

excellent and valuable contribution to the subjects discussed by this Society, it is capable of advantageous development in several respects. In § 10 reference is made to the seeming dissimilarity of the stellar bodies, especially in the case of the planets, which, it is stated, are found on investigation to be very similar. The writer might here have referred to the recent discoveries in connection with the spectral analysis;* and I suggest that it would have been well worth the while of an Institution like this, to have heard, and quite in harmony with the well-known attainments of the writer of the paper, if he had made some reference to this subject. (Hear.) This wonderful discovery, so lately made, has enabled us to know that the planets are similar in their character to the earth on which we dwell, and that there is some reason to believe that even the so-called fixed stars, which are suns themselves, are also composed of the same elements. Again, in § 14 a further reference is made to an interesting analogy between the constituent parts of the earth, and the various things found in the Bible, against which it is charged, that they are thrown together confusedly and without discrimination, and that therefore the Bible cannot be the work of the divine Creator. It is said by the writer of the paper that we find the various strata of the earth, although seemingly thrown together without order, yet, by means of this apparent disorder, bringing up to the surface where needed the various elements required for the comfort and sustenance of man. No doubt this is in itself a very

* Mr. R. A. Proctor, F.R.S., has since written in regard to a recent discovery as follows:—"News has been received about the constitution of the atmosphere of Uranus, and news so strange (apart from the strangeness of the mere fact that any information could be gained at all respecting a vaporous envelope so far away) as to lead us to speculate somewhat curiously respecting the conditions under which the Uranians, if there are any, have their being. Admitting that the line seen by Dr. Huggins is really due to hydrogen—a fact of which he himself has very little doubt—we certainly have a strange discovery to deal with. If it be remembered that oxygen, the main supporter of such life as we are familiar with, cannot be mixed with hydrogen without the certainty that the first spark will cause an explosion (in which the whole of one or other of the gasses will combine with a due portion of the other to produce water), it is difficult to resist the conclusion that oxygen must be absent from the atmosphere of Uranus. If hydrogen could be added in such quantities to our atmosphere as to be recognizable from a distant planet by spectroscopic analysis, then no terrestrial fires could be lighted, for a spark would produce a catastrophe in which all living things upon the earth, if not the solid earth itself, would be destroyed. A single flash of lightning would be competent to leave the earth but a huge cinder, even if its whole frame were not rent into a million fragments by the explosion which would ensue. Under what strange conditions, then, must life exist in Uranus, if there be indeed life upon that distant orb. Either our life-sustaining element, oxygen, is wanting, or, if it exists in sufficient quantities (according to our notions) for the support of life, then there can be no fire natural or artificial, on that giant planet. It seems more reasonable to conclude that, as had been suspected for other reasons, the planet is not at present in a condition which renders it a suitable abode for living creatures." [Ed.]

important argument drawn from analogy ; but I think it would have been well if there had also been reference to the fact, that just as each book of Scripture has its definite object, so also had each stratum of the earth its particular use, which affords an explanation of the reason existing for the variety observable. The Book of Deuteronomy, in the Old Testament, had its definite object, as also have the Epistles of St. Paul, each, in its own way, fulfilling its destined purpose ; just as recent discoveries have shown that there have been important eras in the history of geology, in which each stratum, or series of laminae, have had their due relation to the work of the Creator. I would therefore suggest, that in this way the point which has been so well taken up by the writer of the paper might have been illustrated with advantage.

Mr. J. P. HARRISON.—I will just offer a remark or two as to what has been said about different races of man, and as to the negro being pictured on the monuments of Egypt so soon after the Flood. There seems, to my mind, no reason to suppose that there may not have been a black man in the ark, because it is quite possible that the black race may have been developed before the Deluge. It should be remembered that we have the four races of mankind distinctly marked as they are, and corresponding with the four patriarchs of the ark—namely, Noah and his three sons. If these all went in different directions, to different parts of the world, the races would be thus kept separate, and the peculiar features of each portion of the family would become developed and spread, while, by intermarriages between the different races, varieties would be very quickly produced.

Captain M. S. NOLLOTH, R.N.—I should like, Sir, to make a brief observation in reference to what has been said about the varieties and origin of the human species. I believe it is admitted that in both America and Australia, a small but perceptible alteration is observable in the appearance of the race during the brief periods of our connection with those countries respectively. The peoples have become taller and thinner, and in minor respects different from their European ancestors ; and the Australians are said to be approaching more nearly in each generation to the Anglo-American type. I venture to think it somewhat strange that the darkest-skinned Hindoo should, in the long frame-work, be more like the white Caucasian than the Mongolians, many of whom are as white as ourselves, while their—the Mongolians'—frame approaches in several respects to that of the Negro, as do their facial features, in certain particulars, to that of the latter. I think that, with many persons the difficulty of believing in a common origin lies more in difference of mere colour of skin, than in that of osteological features. But I do not profess to be learned in these matters.

Mr. WELDON.—I have to thank those that have spoken, for the gentle manner in which they have applied their criticisms to my paper. I must say that I expected to have been much more "cut up" than I have been, and I am glad to find that you have so generally agreed with the drift of my observations, relative to the origin of species. I regard it as one of

the advantages of reading a paper before an audience in whom unity in variety exists, that the arguments may be criticised with any amount of keenness, provided the criticism be based on sufficient data. (Hear, hear.) I have also noticed from time to time, that in papers read to mixed audiences, as critic after critic rises up, the authors of the papers have very little to reply to, because the several critics answer each other as the discussion goes on. In the present instance I am much obliged to Mr. Howard and Mr. Harrison, who have already anticipated my remarks in reply to Dr. Currey, who spoke first of all with regard to species. Perhaps I may be allowed to say here, with regard to the paper before me, that I mention in the prefatory portion of it that I was dealing with the subject only in an elementary and suggestive manner; and I am glad to find that, to some extent, my suggestions have been taken up. I also feel that if I had written a much longer paper, it would not be so satisfactory as it now is to go away with the knowledge that I have been criticised for not being long enough, inasmuch as this is a fault which, generally speaking, we clergy are not often found guilty of. With regard to the allusion which has been made to distinct varieties, which have been clearly marked, and preserved through successive generations, we must remember that in past times the means of locomotion were very little known, and that those who happened to find themselves on islands, or in situations where they were separated by great convulsions of nature from the rest of the world, could hardly be expected to undergo any change of type. People so circumstanced must for ever preserve the same types which were originally found to prevail in the different islands and continents upon which they have lived, separated from other tribes by the impassable obstacle of the ocean. The question has been asked to-night, "How is it that these different types remain so constant, and so uniformly maintain the same characteristics?" My reply is that they continue constant because they have nothing to interfere with their remaining so; but the moment you introduce other races, as has been observed by one gentleman who has addressed us, you find from that period an alteration of the type—a change in the external form of skull takes place at once. (Hear, hear.) While travelling through the forests in the interior of the Sierra Nevada I came across two Englishmen, who, seeing me wandering through that unfrequented part of the world, almost took me for an improved order of gorilla. They asked me to their huts, and introduced me to their wives, and in both cases the wives or squaws were original, thoroughbred, out-and-out specimens of the Indian Digger race. It was a treat to witness the pride of those two men as they showed their little children. One of them had two children, five and seven years of age respectively, both of whom he brought forward, and he would not allow me to leave the hut till he had shown all their points. He said, "I intend bringing these two little boys to London to show what an improvement may be made in the race." And certainly, when I compared the type of the humble and modest squaw, who seemed to have anticipated the use of veils, with the beautiful children of whom she

might well be proud, I could not help seeing that the introduction of another race had considerably altered, even in the very first generation, the appearance of the skull and all the other characteristics which are considered as having been for ages constant and unvarying. (Hear, hear.) There is another fact which I wish to point out, and that is that the Anglo-Saxon race generally runs itself pure; that is to say, that as the Anglo-Saxon race becomes associated with the various races of the earth, the progressive development theory is sure to end in very greatly improving the races with whom the Anglo-Saxon element comes in contact. I wish you to remember, therefore, that the absence of the means of locomotion, and the lack of intermarriages, have a great deal to do with accounting for the marked and constant appearances preserved throughout successive generations of the same types. Another point to which attention has been called is that of the argument derived from botany. What I meant by referring to the orders of grasses was this: I cannot help thinking that if you were to take up a single piece of meadow grass, and show the stalk of it to some ignorant and well-meaning peasant, telling him that it was of exactly the same family as the sugar-cane, he would look at it with very wondering eyes, and you could scarcely expect that he would give credence to the statement. I intended by the analogy I thus employed, to say that there does not appear to be a greater difference among the varieties of the human race, than what we see among the different varieties of the same order of grasses, and my object was merely to show the unity of plan which is everywhere apparent in almost endless varieties of forms. With regard to what has been suggested as to Scriptural testimony, possibly I may be open to correction there; but I was under the impression, from what I had read in the *Times* with regard to the recent discovery, that there was an undesigned coincidence in the new testimony in support of the statement that there had at one time been a great cataclysm or deluge, and that whatever there might be in the various traditional descriptions of this great event, which tended to support the Biblical narrative, all helped towards establishing its truth. (Hear, hear.) We know how frequently it happens that things, which in themselves are mere nothings, when taken in the aggregate, become very important, and in the same way I say that things which are found outside Scripture, although only regarded as mere myths, are often truths which have been perverted, as we know must be the case where they can only be preserved by oral tradition.

Mr. Row.—Pardon me; I think you have misunderstood. I did not say that the myths themselves might not be evidence, but that in the particular case of the stone which has been recently deciphered, the story was by the inscription itself shown to have been classed among a set of myths.

Mr. WELDON.—I am a great believer in the mythological histories of the old Greeks and Romans, as proving how a great variety of truths may in the progress of time have lost the original impress of truth, as is always the tendency of history handed down by means of oral tradition only. With regard to the brevity of my paper, noticed also by Mr. Row, I must confess

that that was a designed coincidence. I felt that, as this was the first time I had come among you, it would be rather presuming on my part if I were to take up too great a portion of your time. Moreover, there is some degree of satisfaction in knowing that one fault alleged against the paper was that it was too short. I may also say, at this point, that I have extended my analogy considerably further than has appeared in the paper; and if I had had time, I would have pointed out that there is an analogy between the four ages of nature, which I have classified as the reigns of fishes, reptiles, mammals, and man, and the successive dispensations, as mentioned in the Bible. There you will see the Patriarchal dispensation, the Levitical, the Prophetical, and the dispensation of the New Testament. I look on old Judaism, with its types and symbols, as containing so many petrifications, as it were, which it is most useful for us to refer to, and which help many a time to throw light on what we see in the New Testament. But I did not think it necessary for me, in such a paper as I have read, to go into these details. With reference to what has been said about the Germanic, the Greek, and the Celtic forms of Christianity, I wish to make one observation by way of caution, and it is this: The law of variety has its limits, and this is most beautifully shown in the case of orchids, to which reference is made in the paper. Do your best, and you cannot propagate them beyond a certain limit, and this is one of the strongest and most fatal facts that can be used in opposition to the Darwinian theory. And so it is with regard to the various forms of Christianity. I maintain that by analogy, every form of Christianity retaining the simple truths of the Bible is a form of Christianity which is in itself pure, and good, and excellent; but this observation is to be limited in proportion as there is introduced upon those Bible truths, anything which verges upon mere tradition. I might have alluded to the Greek Church; but I did not like to enter into these things in my paper, because I did not know but that, although there might be unity here in general, there might be great variety in details. (Laughter.) But I cannot help saying, however much I may differ from some of my friends on this point, that I am somewhat catholic and liberal in my views, which I may explain by the expression of St. Paul, that there are differences of denominations, but the same Lord. (Hear, hear.) Every one of us, as a basis of unity, may acknowledge the same Lord, but there may be many differences as to other matters. With regard to what Mr. Row has said, about the danger of assuming that many of the peculiar structures of the animal creation have resulted, not from the act of the Divine being, but from the fall of man; I think that there is no creature which has been placed upon this earth that does not show, in some way or other, the wisdom of the Great Designer; but how far we are to trace back the various evils to be noticed in connection with God's creatures, to their Almighty Maker, is quite another question. (Hear, hear.) This point arises in connection with the venom of the serpent, the trickery of the fox, and many other well-known instances; but this sort of inquiry might lead us too far back out of the original line of argument, because we can never forget that there is a

spirit of evil, as well as a spirit of good, and how far that spirit of evil has been suffered to prevail, and for what end, is not for us to determine, and pronounce with any degree of certainty. With reference to the subject of the spectral analysis, I may state that I did not wish to introduce that topic, for I find that in several of the papers or discussions in connection with this Institute, that peculiar analysis has its place. I might also have introduced the authority of the Duke of Argyll, if I had not likewise seen him quoted before in previous papers; but you will observe that I do say, in § 10 of my paper, that the planets which are apparently so dissimilar, are constructed in the same manner; and the information on which this is affirmed has been obtained, among other sources, from the spectral analysis. With respect to what has been said as to the illustrations to be drawn from the Bible, I would desire very briefly to observe, that as each stratum of the earth's surface is essential for the uniform production of those things which are requisite to our existence, so I hold that you cannot eliminate a single book from the Bible without interfering with the beautiful uniformity of design that pervades the whole of the Word of God. Every stratum of the earth has its particular adaptation, each helping to produce the general result; and in the same way, whatever casket you unfold in the Word of God, from Genesis to Revelation, you will be sure to find some precious jewel regarding Jesus Christ, which, whether it be put before us in the shape of prophecy, parable, symbol, or type, is illustrative of the great truth to be afterwards disclosed when in the fulness of time the occasion arrives. (Hear, hear.) With reference to what has been adduced in relation to the character of the Egyptian monuments, I think it would not be wise for us to trust to the colouring which has been employed on the various vases and tombs that have been discovered in Egypt. I hardly think that the Egyptians knew much about the art of colouring, and I do not regard the fact that some of the figures were delineated in black pigments as a very strong argument that they were intended to be represented as black. And then, with regard to the question how far the sun has an effect upon human beings, so as to produce a remarkable colour which is capable of being inherited, is a matter that has been very little touched upon as yet. I know that in the case of tribes of the Mexicans, originally descended from Europeans, you would suppose that they were approaching half-way to what is termed the black colour, simply from the constant exposure to the sun, as well as from peculiarities of food, and so forth. In my opinion, we have a great deal yet to learn with regard to this question of colour and pigment; and the subject is, I confess, one upon which I am too ignorant to know how it could be properly treated. With regard to the general effect of the paper, I have simply to say that I should be very happy to receive from any one here, any suggestion which he would like to see developed in some other form; but I must add that it is very necessary that papers, such as are read at these meetings, should not contain too much; and it is, I think, rather a good fault if, when we go away from an entertainment,

whether of a festive or a literary character, we are still desirous of a little more.

Mr. Row.—I should be glad if the author of the paper would state his authority for the extraordinary fact that the bones of a pig will change colour if the animal be fed upon madder, and if he will also state how long it will take to produce this result?

Mr. WELDON.—The fact is well known, and I believe it will take only about six weeks, or even three, to change the colour of the bones. The simplest way of proving this, however, is to try the experiment. However, as I have stated, the fact is generally known; and as another example I may mention the case of bees, whose honey has often been found to take a variety of colour from the nature of the food they obtain during the summer months.

The Meeting was then adjourned.
