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815TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, ON MONDAY, FEBRUARY 7TH, 1938,
AT 4.30 P.M.

SIR AMBROSE FLEMING, D.Sc., F.R.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed and the HON. SECRETARY announced the following elections as Associates :—M. G. Tallach, Esq., M.B., Ch.B., and F. T. Farmer, B.Sc., Ph.D.

The CHAIRMAN then called on Dr. Hart-Davies, M.A., D.D., to read his paper entitled "The First Two Chapters of Genesis Considered as a Basis of Science" (being the Gunning Prize Essay, 1937).

*THE FIRST TWO CHAPTERS OF GENESIS
CONSIDERED AS A BASIS OF SCIENCE*

By The Rev. D. E. HART-DAVIES, M.A., D.D.

(Being the Gunning Prize Essay, 1937.)

IN any attempt to demonstrate the scientifically accurate basis of the first two chapters of the Book of Genesis special regard must be had to three of its marked characteristics, viz., the brevity of the narrative, the simplicity of its diction, and the obviously religious purpose of the record. Precise definition and comprehensiveness of statement cannot easily be accommodated in close quarters. Simplicity of diction is about the last thing we expect to find in a strictly scientific treatise. And it should always be carefully remembered that the outstanding purpose of the Genesis record was not to reveal how the world was made, but the sublime fact that the Maker of the world willed to be regarded as a Father and Redeemer. The Creation stories of Genesis are only a preface to the great theme of the Bible, which is the record of the redemption of mankind.

Notwithstanding, however, the limits imposed by its brevity, its simplicity and its religious purpose, the scientific accuracy of

its statement becomes more apparent the more carefully the record is examined. And this I understand is the subject which this Essay is intended to illustrate.

But the first two chapters of Genesis are much more voluminous in records and references of a scientific nature than many apparently imagine. Within the prescribed limits of this essay exhaustive treatment is not possible. I intend, therefore, to confine myself to what appear to be the most prominent features of a scientific character in the Scriptural record embraced by the two chapters under review. They may be conveniently summarised as follows: (i) The Unity of the Source of the Universe; (ii) The First Fiat: Let there be Light; (iii) The Time of Creation; (iv) The Order and Progressiveness of the Process; (v) Man the Climax and Crown of Creation; (vi) The Formation of Woman out of Man; (vii) The Garden of Eden and the Cradle of the Race; (viii) The Firmament: An Alleged Mistake of Moses; (ix) Evolution or Creation: Which is Reasonable and Scientific? (x) Biblical Anticipation of Modern Discovery; (xi) Conclusion: A Basis of Science for Religion.

I.—THE UNITY OF THE SOURCE OF THE UNIVERSE.

By means of spectrum analysis a new metal was discovered in the sun before its presence had been detected in the earth. It was called helium from the Greek word for sun. That was in 1868. It was not until 1895, however, that helium was found in the earth. Of the ninety or more chemical elements now known to exist in the earth, fifty-seven have already been located in the sun. There is no substantial reason to suppose that the others are absent. Further, there are many stars whose spectra are exact counterparts of the spectrum of the sun. Modern physics, moreover, has shown that an atom is a complicated structure which closely resembles a miniature solar system. The nucleus of the atom corresponds to the sun, and the electrons which move in orbits around it correspond to the planets like Mars and Jupiter in their revolutions around their central sphere.

Now, although these facts may not absolutely prove, they certainly do suggest and point to unity in the realm of nature, whatever be the ultimate source of all that is. Whoever made the earth made also the sun; whoever originated the rise and

fall of the tides of the ocean caused also the planets to travel along certain appointed celestial paths. The same laws which govern the slide of a rain-drop down a window-pane operate in the mutual relationships and majestic movements of mighty orbs in space. There is not, and apparently cannot be, a multiplicity of origins. That fact or supposition seems, in the light of modern science, to be now self-evident and generally admitted.

One very arresting revelation of recent scientific research, when contrasted with prevailing views of a previous generation, is the conclusion drawn by Sir James Jeans that this unity of source presents a manifestation of mind. In his book, entitled *The Mysterious Universe*, he writes: "Only after much study did the great principle of causation emerge. In time it was found to dominate the whole of inanimate nature." Then followed a tendency "to interpret the whole material universe as a machine, a movement which steadily gained force until its culmination in the latter half of the nineteenth century."*

In the meantime there has been a widespread reaction from the mechanistic theory of the universe. After a carefully reasoned argument, based upon the newly acquired facts and ascertained phenomena of the early twentieth century, Jeans reaches the conclusion that "from the intrinsic evidence of his creation, the Great Architect of the universe now begins to appear as a pure mathematician."† He then goes further, and, in reference to the philosophy of a bygone age as propounded by Bishop Berkeley, he affirms: "It does not matter whether objects exist in my mind, or that of any other created spirit, or not; their objectivity arises from their subsisting 'in the mind of some Eternal Spirit'."‡

Later, he proceeds: "To-day, there is a wide measure of agreement, which on the physical side of science approaches almost to unanimity, that the stream of knowledge is heading towards a non-mechanical reality; the universe begins to look more like a great thought than like a great machine. Mind no longer appears as an accidental intruder into the realm of matter We discover that the universe shows evidence of a designing or controlling power that has something in common with our own individual minds." But he concludes with a

* Pp. 15, 16.

† P. 134.

‡ P. 137.

rather melancholy confession of the inability of science unaided to lead to a satisfactory resting-place, when he affirms that "everything that has been said, and every conclusion that has been tentatively put forward, is quite frankly speculative and uncertain."*

We thus realise afresh the limits of scientific investigation. Science can take us so far, but no farther. Jeans' confession recalls the pathetic lamentation of ancient days: "Canst thou by searching find out God?" "Oh that I knew where I might find Him!"† But at this point a forcible reminder reaches us from the *Epistle to the Hebrews*: "Through faith we understand that the worlds were framed by the Word of God, so that things which are seen were not made of things which do appear."‡

Faith can begin where reason and scientific inquiry end; especially if we can assume that there are two volumes of divine revelation—the works of God in nature and the word of God in holy Scripture. One is the complement and supplement of the other. Such faith is not divorced from reason; it is rather the handmaid of reason. Resting its ladder upon the bed-rock of ascertained scientific fact, it seeks to climb by faith to a higher and purer knowledge of the divine Source of things created. It is not a rash but a reasonable step upwards to accept the simple but sublime statement with which the Genesis record opens: "In the beginning God created the heaven and the earth."

If the question be asked, By what power did the world and all that is contained therein come into existence? the Bible answers, by the power of the living God. The creation is repeatedly attributed to the operation of one personal, intelligent, omnipotent Deity, Who sees the end from the beginning, and works out His designs according to His sovereign will. "In the beginning God!" Not less than forty-six times in thirty-four verses is the divine name or the divine activity referred to. He creates, He makes, He appoints, and He pronounces His handiwork to be good. Thus, by the use of one simple, majestic phrase, the Bible repudiates Atheism, which denies the existence of God; Materialism, which assumes the eternity of matter; Pantheism, which identifies God with the universe; Polytheism, which ascribes all nature to a plurality of divinities; and Evolutionism, which traces the development of the cosmos by an impersonal,

* Pp. 148, 149.

† Job xi, 7; xxiii, 3.

‡ xi, 3.

automatic process, operating nobody knows how, from a single cell of protoplasm mysteriously existent in the ooze of a primeval ocean. Genesis affirms that creation was not by chance, but by one God, the high and holy Architect, Whose name or nature is progressively unfolded throughout the realm of Holy Scripture.

Although it may not be included within the scope of the present inquiry it is of interest to add that what natural science suggests and Scripture reveals, both archæology and philology have in recent years abundantly confirmed. The unity of God now appears unquestionably to have formed part of a primitive revelation. It used to be too readily assumed that mankind in its religious conceptions had risen from animism to polytheism, and thence to monotheism. The process, we now discover, has been in the reverse direction.

In 1931, Professor Schmidt, of Vienna, who is regarded as the leading authority on the subject of anthropology and comparative religion, published a volume entitled *The Origin and Growth of Religion—Facts and Theories*, in which he testifies from evidence collected all over the world to a universal belief among primitive races in one supreme Being.

Moreover, Dr. Langdon, Professor of Assyriology in the University of Oxford, who has been in charge of the excavations at Kish, near to the site of ancient Babylon, writes, as a result of his archæological investigations: "In my opinion, the history of the oldest religion of man is a rapid decline from monotheism to extreme polytheism and wide-spread belief in evil spirits. It is in a very true sense the history of the fall of man."*

II.—THE FIRST FIAT: LET THERE BE LIGHT.

The cheap sneer of Voltaire, "And how did the light come before the sun was created?" cannot be repeated by his infidel successors of to-day. For modern scientific investigation is, as we shall presently discover, on the side of Genesis in its record of the first creative fiat.

Not that the mystery has been solved. Sir Ambrose Fleming has related in my hearing the opinion of a brilliant modern scientist that all we can yet say with certainty respecting the

* *Field Museum Leaflet*, 28.

nature of light is that we are completely in the dark! The corpuscular theory, which was generally held in the seventeenth century, had to give way in the nineteenth century to the undulatory theory; and this in turn is destined to be discarded or very seriously modified. For now it appears that light is both corpuscular and undulatory; that it consists of both particles and waves at the same time.

It is a rash proceeding, therefore, to criticise the statement in the third verse of the Genesis record on the assumption that the primeval light of the first day was sunlight. Of what nature it was precisely, the divine Author alone knows. Some think that it may have been akin to the Aurora Borealis or "Northern Lights," which, in all probability, are produced by magnetic disturbance; or it may have been the mysterious product of some kind of radio-activity. For all light is not of the same nature. Light may proceed from combustion or incandescence or phosphorescence. Man, apparently, cannot produce light without heat. The glow-worm and the fire-fly succeed where man has so far failed.

We may be reasonably certain, I submit, that the light which first illumined our planetary sphere was not sunlight. According to the nebular hypothesis, which used to be widely accepted by modern astronomers, the earth, together with the sun, the moon, and the other planets of our solar system, originally formed one vast indistinguishable vaporous mass. Portions broke away from the mass, whirling around the central nucleus, which ultimately became the sun. The earth passed through a prolonged cooling-down process; a skin or crust formed on its surface. During this period there was a time when the earth was itself incandescent. While the planetary condensation was proceeding, immense masses of dense vapour must have encircled the earth, excluding the view of anything beyond or above. Only on the fourth day of the Creation period did the sun and moon appear as luminaries and measurers of time, "like the two hands on the dial of a heavenly clock."

In this connection it should be remembered that earth and sun and moon are all embraced in the creation of the universe, summarily described in the first verse of the chapter, which says: "In the beginning, God created the heavens and the earth." Moreover, the verb בָּרָא (*bara*) "create" does not occur in the description of the work of the fourth day. There the word is אָסַח (*asah*) to make or appoint; as the rainbow in the days

of the judgment of the flood was made a sacrament in the sky. Thus verse 16 might quite accurately be rendered: "God appointed the two great luminaries, the greater luminary to rule the day, and the lesser luminary to rule the night."

Mr. E. W. Maunder, F.R.A.S., who was for over thirty years an astronomer in the Greenwich Observatory, writes in this connection: "It has often been the subject of comment that light is mentioned in Gen. i as having been created on the first day, but the sun not until the fourth. The order is entirely appropriate from an astronomical point of view, for we know that our sun is not the only source of light, since it is but one out of millions of stars, many of which greatly exceed it in splendour. Further, most astronomers consider that our solar system existed as a luminous nebula long ages before the sun was formed as a central condensation."*

More recently, in a book written by two devout scientists, the emphatic statement occurs: "Nor is it any great difficulty that light and darkness, and plant life, are spoken of before the sun and moon can be seen from the earth. Any student of astronomy knows that on a young planet there will be a stage when it is covered with water and cloud and that there will be a distinction between light and darkness before the clouds part sufficiently to make the sun and moon visible. If the Nebular hypothesis is to be accepted, there would be a period when the earth would have been formed, but the glowing mass in the centre of the solar system might not yet have consolidated into the sun. It is quite probable that plant life might have begun in this stage."†

III.—THE TIME OF CREATION.

In the consideration of this section of our subject it will be convenient to observe two divisions: (i) The Date of the Beginning of Creation; (ii) The Duration of the Period of Creation. These two divisions need to be carefully distinguished, as indeed they actually are in the Genesis record itself.

(i) Concerning the date of Creation, misunderstanding has frequently arisen through the fact that in certain copies of the Scriptures dates are found printed on the margins. But these

* *The Astronomy of the Bible*, p. 69.

† Colgrave and Short: *The Historic Faith in the Light of To-day*, p. 46.

form no part of the original Biblical writings. They are purely human additions. They may be of value, or they may be misleading. Archbishop Usher's chronology, *e.g.*, has no Biblical authority behind it. When the uninstructed reader sees 4000 B.C. at the top of the first chapter of Genesis, he may be pardoned if he rushes to the conclusion that the Bible affirms that the beginning of Creation occurred only some four thousand years before Christ. The Bible makes no such declaration. The only chronological statement in Genesis in this connection is that with which the record opens: "In the beginning." The only date of Creation for which the Bible is responsible is what has been well called "the dateless date." And all the researches of modern science can add little thereto.

(ii) With regard to the duration of the period of Creation, the Bible has suffered not only from the attacks of infidels without the fold but also from the strain put upon it by earnest but unwise defenders of the Faith within. Some of these maintain that the six days of Creation are of necessity to be interpreted as twenty-four-hour days measured by the ticking of a clock. Those who are out to impugn the accuracy of the Genesis record eagerly embrace this interpretation. But I personally make no such present to our opponents.

For the Hebrew word for day יֹמִים (*yom*) is a very elastic term. It is used, of course, to signify a precise period of twenty-four hours' duration; as when we say that a steam-ship can now cross the Atlantic in less than five days. It is used again to signify a period of less than twenty-four hours; as when day and night are contrasted or coupled together. A notable instance of this use occurs in our Lord's saying, "Are there not twelve hours in the day?" (St. John, xi, 9.) Further, there are numerous instances both in the Old Testament and the New where the word obviously connotes a period of indefinite and sometimes prolonged duration; *e.g.*, "The Lord alone shall be exalted in that day" (Is. ii, 11); "Your Father Abraham rejoiced to see my day" (St. John viii, 56); "Behold now is the day of Salvation" (2 Cor. vi, 2).

Moreover, in the Creation story itself, the word is employed in such a way as to suggest a prolonged, indefinite period. In chapter ii, 4, it is used to sum up and embrace the entire period of the creative activity previously described in six stages. Again, in chap. ii, 2, it is affirmed that "God rested on the seventh day." Are we then to suppose that God's Sabbath rest was limited to

twenty-four hours of human reckoning? We have evidence that the Jews and the early Christian fathers were not so restricted in their interpretation of the word. Augustine, in the fourth century, used to point out that for a very considerable portion of the Creation period the sun as a time measurer was not in existence; hence it was difficult to determine the precise duration of the "day."

Dr. Rendle Short, whose opinion as a scientist and student of Scripture ranks very high in this connection, thus testifies: "Many eminent conservative Bible scholars resolve the difficulty, more satisfactorily we believe, by interpreting the "days" as periods of time of indeterminate length. It seems fair to regard them as representations of God's time, periods of rest alternating with periods of activity. The seventh day of rest still continues, in that apparently no new creation of totally distinct classes of animals and plants has taken place during the time of human history."*

I submit therefore that the "days" of these early chapters of Genesis are not man-measured but God-measured days. They should be interpreted in the light of the Apostolic declaration: "Be not ignorant of this one thing, beloved, that one day is with the Lord as a thousand years, and a thousand years as one day." (2 Pet. iii, 8.)

Frequently, however, a question arises concerning the precise interpretation of the statement which reads, according to the A.V., "And the evening and the morning were the first day." Some regard this as an indication of very limited duration. The literal rendering of the Hebrew original reads: "And there was evening and there was morning, day one." Now whatever be the precise significance of the phrase, I submit that it was never intended to suggest the length of the time occupied in creation, but rather the process, which was by an orderly, progressive movement in six distinct stages, proceeding from darkness to light, from chaos to cosmos, from evening to morning, with a definite beginning and ending to each.

Hugh Miller, the devout Scottish geologist, wisely argued in his book, *The Testimony of the Rocks*,† that in the beginning of Genesis as in the end of Revelation we have an apocalypse. In the former it is an apocalypse of the first heaven and earth; in

* *The Bible and Modern Research*, p. 39.

† Pp. 187-191.

the latter of the new heaven and earth. No human reporter was present when the world was created. The challenge which rings out in the book of Job reveals the impotence of the mind of man to account, apart from revelation, for the origin of the handiwork of God: "Where wast thou when I laid the foundations of the earth? declare, if thou hast understanding."* Hugh Miller suggests, therefore, that in Genesis we have a kind of panorama of creation—an apocalypse of its divinely-ordered development in six periods, each period being distinguished in the vision by beginning with an evening, and ending with a morning.

Godet has embraced the same idea. In his *Studies on the Old Testament* he says: "We must acknowledge in the Mosaic record a revelation, but not in the form of a dictation. It is, as we expected beforehand, knowledge given under the form of pictures, analogous to those of the prophetic visions . . . If it was the purpose of God to cause Moses to contemplate in an abridged form the principal phases through which the work of creation passed in its gradual development, would not the best way of giving him an idea of it have been to paint each period in a single picture which should represent in one grand scene the stage which the work had then reached? Each of these pictures was to the eye of Moses one *day* . . . The interval which separated this picture from that which followed it was a night . . . Thus there passed before his eyes these six pictures, representing the most characteristic phases of the entire work. He has preserved for us a memorial of these phases, but without having himself penetrated into their meanings in detail, any more than the prophets were able clearly to understand the intuitions excited in them by the Divine Spirit."†

IV.—THE ORDER AND PROGRESSIVENESS OF THE PROCESS.

An arresting feature of the Genesis record is the gradual and progressive order of development which is delineated therein. This in itself presents a formidable challenge to the unbeliever in its divine inspiration. For the order of the Creation process so exactly harmonises with the ascertained facts of science that some of the most distinguished scientists have reached the belief that the supreme Architect in the realm of nature and the

* xxxviii, 4.

† Pp. 121-2.

ultimate Author of the Genesis cosmogony are one and the same.

The record opens with a simple but profound statement in the first verse which summarily describes the creation of the whole universe: "In the beginning God created the heavens and the earth." Then follows a description of the chaotic condition of formlessness and emptiness and darkness of the earth prior to its gradual construction to become an ordered and beautiful and fruitful habitation for mankind. And this supremely important note is added: "And the spirit of God moved (or was brooding) upon the face of the waters"—a statement which recalls the credo: "I believe in the Holy Ghost, the Lord and Giver of life."

At this point one perhaps should pause briefly to mention a theory which is held by a considerable number of devout Bible students. They maintain that between the first and second verses of the Genesis record we are to understand that some gigantic catastrophe, some destructive cataclysm occurred, which brought about the chaotic condition described in the latter verse. In support of this opinion they translate וְהָאֲרֶזֶץ הָיְתָה by "And the earth became" instead of "And the earth was", as in both the authorised and revised versions. I, personally, cannot accept that interpretation. Few Hebraists, I am convinced, would be willing to translate the Hebrew in the manner suggested. My own opinion, which is the one generally held, is that the first verse is a summary statement embracing the creation of the entire universe—the heavens and the earth. In that one verse is summed up the origin of our solar system and of all the worlds in space. There follows a record which concentrates attention upon the formation of the earth to be an abode for mankind. In that record we are told how this transformation proceeded from darkness to light, from formlessness to order, from the inanimate to the animate, from chaos to the cosmos.

Dr. Rendle Short, no mean authority, comments thus upon the theory in question: "When Geology was a young science and these difficulties were perceived, a comparatively easy way of escape was propounded by conservative theologians. They introduced what may be called the catastrophe theory, which seems to have been promoted by Dr. Thomas Chalmers, in 1814. It was suggested that the proper translation of Genesis i, 2, is, 'And the earth became without form and void'; that a great

catastrophe occurred, which put an end to all forms of life known to the geologist, and left an empty world which the Almighty replenished with life in six ordinary days. We do not think the catastrophe theory is likely to commend itself to persons with a scientific education. The suggested new translation, whilst perhaps not *impossible*, is a very unnatural rendering of the Hebrew. The word translated 'replenish' in Genesis i, 28, is simply *male*, 'to fill,' and in the Hebrew has no sense of refilling. The theory creates scientific difficulties greater than those it is intended to solve."*

Now we pass to consider the gradual and progressive order of the creative work of the six days as delineated in the Genesis cosmogony. The process may be briefly indicated as follows :—

First : "And God said, Let there be light : and there was light." The darkness of the chaotic condition of the earth is dissipated by the introduction of light—from what source is not revealed. Our attention is at once arrested by the fact—no mere coincidence—that the first creative word in the Bible harmonises with the last explicit word of modern astronomical science, as expressed by Sir James Jeans : "The tendency of modern physics is to resolve the whole material universe into waves, and nothing but waves. These waves are of two kinds : bottled-up waves, which we call matter, and unbottled waves, which we call radiation or light. If annihilation of matter occurs, the process is merely that of unbottling imprisoned wave-energy and setting it free to travel through space. These concepts reduce the whole universe to a world of light, potential or existent, so that the whole story of its creation can be told with perfect accuracy and completeness in the six words : 'God said, Let there be light'."†

Second : "And God said, Let there be a firmament (or expanse) in the midst of the waters" (v. 6), to divide the waters resident in the clouds above from the waters of the oceans below. In this fiat the creation of the earth's atmosphere is indicated together with the laws which govern the suspension of the vapours therein. A phenomenon in the realm of nature most wonderful is that mysterious blending of oxygen, nitrogen, and other elementary gases which constitutes the earth's envelope of air ; a substance apparently so light that on certain days we

* *The Bible and Modern Research*, p. 38.

† *The Mysterious Universe*, pp. 77-78.

are scarcely conscious of its presence, yet so powerful as to be able to bear upon its bosom billions of tons of water evaporated from the ocean, to be conveyed across the continents and distributed in the form of rain. To quote the Astronomer Royal, Dr. H. Spencer Jones : " Water-vapour plays a part of great importance in the atmosphere. It is present only in the lower layers, clouds rarely being found at heights greater than about 6 miles. If the atmosphere contained no water-vapour, there would be neither clouds, dew, rain, hail, snow nor thunderstorms, and neither plant nor animal life would be possible."*

Third : The record proceeds to relate the separation of the land from the water and the appearance of the continents. The earth's crust is ridged up ; the waters are gathered into one place : and the beginnings of vegetation make their appearance. Thus we read : " And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear : and it was so." (v. 9.) " And God said, Let the earth put forth grass, herb yielding seed, and fruit tree bearing fruit after its kind, wherein is the seed thereof, upon the earth : and it was so." (v. 11.) In this relation we note how the appearance of grass, herb and tree corresponds to the threefold order of primeval vegetation, as represented by modern science.

Fourth : There follows the formation of the luminaries of the sun and moon, and their appointment, in relation to the earth, as measurers of time and regulators of seasons, as distributors of light and dividers of the day from the night. " And God said, Let there be lights in the firmament of the heavens to divide the day from the night ; and let them be for signs, and for seasons, and for days and years : and let them be for lights in the firmament of the heaven to give light upon the earth : and it was so." (v. 14, 15.) It should here be carefully remembered, as previously explained, that the Hebrew word *אֵלֶּם* " created " does not occur in this record of the work of the fourth day. It is the verb *אָפַק* which is here employed—a word which might be rendered " made " or " appointed "—as distinct from " created," which connotes the production of something entirely new.

Fifth : By what must surely appear to be a remarkable conjunction in a document so ancient, the creation of fishes and fowls is next related, animals so formed as to be able to inhabit the water and the air. In this creative day the gigantic Saurian

* *Worlds Without End*, p. 12, 13.

reptiles must be included ; for the complete account contained in the two verses (20 and 21, R.V.M.) must be read together : “ And God said, Let the waters swarm with swarms of living creatures, and let fowl fly above the earth on the face of the expanse of the heaven. And God created the great sea-monsters, and every living creature that moveth, which the waters brought forth abundantly, after their kinds, and every winged fowl after its kind : and God saw that it was good.”

Sixth : On the last creative day the mammals appear ; and, after a significant pause, man the climax and consummation of the whole creation. “ And God said, Let us make man in our image, after our likeness : and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.”

Thus the method in creation which Genesis reveals was gradual and progressive, from the inanimate to the animate, from the lowest forms of life to the more highly developed and complex. A fourfold division of the order would be : first, the mineral kingdom ; second, the vegetable kingdom ; third, the animal kingdom ; fourth, the human kingdom. If the narrative were only a product of human invention or speculation we should hardly expect that in the animal kingdom the order of creation would be thus delineated : first, creatures to inhabit the sea ; second, creatures to fly in the air ; and third, creatures to live on the land. Yet such is the strictly biological sequence which modern science demands.

Further, from the purely anatomical standpoint, having regard to the proportion of brain to spinal cord, the Genesis order of progression of fishes, reptiles, birds, mammals, man, is again surprisingly concordant with the accredited results of modern scientific investigation.

To sum up, we have in this first chapter of Genesis a record which is itself, because of its antiquity and its amazing accuracy, a challenge to every sincere scientific inquirer. For here is a cosmogony so detailed as to present the possibility of error in a thousand-fold degree. And, moreover, it is a document which has been in the possession of mankind for some thirty centuries at least. What changes in the realm of natural philosophy have those centuries witnessed ? Every thoughtful scientist is aware that the history of science is largely a record of the mistakes of one generation corrected by the discoveries of the

next. The late Professor Huxley used to say that the ever-recurring tragedy of science is that of a beautiful hypothesis killed by an ugly fact. And quite recently, at the British Association Meeting in 1935, Sir James Jeans is reported to have said: "The theoretical physicist must admit his own department looks like nothing so much as a building which has been brought down in ruins by a succession of earthquake shocks. The earthquake shocks were new facts of observation, and the building fell because it was not built on the solid rock of ascertained fact, but on the ever-shifting sands of conjecture and speculation."

But while science has radically changed during the past four millenniums of written history, this ancient story of creation has proved itself true to millions of mankind, rearing itself above the mists like a Matterhorn, pointing man upwards and Godwards to the only solution of the problem of origins that can satisfy the mind, comfort the heart, and inspire the soul with blessedness of hope for the future. All that we have a reasonable right to expect is a general correspondence between the Biblical cosmogony and the ascertained facts of science. And this correspondence exists to such a degree that Sir J. William Dawson, a former President of McGill University and a world-renowned geologist, did not hesitate to affirm: "We have here a consistent scheme of the development of the solar system, and especially of the earth, agreeing in the main with the results of modern astronomy and geology. It would not be easy even now to construct a statement of the development of the world in popular terms so concise and so accurate."*

V.—MAN THE CLIMAX AND CROWN OF CREATION.

It is sometimes said that in the Genesis record there are two distinct stories of Creation. That is a statement which will not bear the test of precise examination. It is a theory hastily arrived at which proceeds from an inadequate conception of the object which the author of Genesis, whoever he was, had before him. For the Bible is concerned primarily and persistently with man's relationship to God. It is not out to teach science; it is out to show how mankind can live in fellowship with the

* *Eden Lost and Won*, p. 50.

Eternal. It is in the light of that fundamental fact that the relationship of the first two chapters of Genesis can be truly apprehended.

In chapter one all nature is in the ascendant : in chapter two man is supreme, and nature is referred to only as it touches nature's lord. The two chapters are not contradictory ; they are complementary. One prepares the way for the other. Together they illustrate the Hebrew law of recurrence. A characteristic of Hebrew narrative is repetition with addition. A fact is first recorded in barest outline ; then it appears to be repeated with some illuminating addition ; presently it will reappear with added details which complete the picture.

In the first chapter of Genesis there is delineated the story of creation as a whole ; in the second chapter is described the creation of man as the starting-point of the great Biblical theme of human history with its revelation of the need of a divine redemption.

The creation of man is recorded in brief space but in very significant terms. Three verses sum up the story—two in the first chapter and one in the second. According to the Genesis record, man is compounded of two elements—dust and Deity. His body is formed of the materials of the earth ; his soul or spirit is the product of the breath of God. Thus he has at the least a twofold nature and origin. He is connected as to his physical structure with the animals that preceded his creation ; but he is absolutely differentiated from them by reason of his spiritual nature which has its origin not from earth but from heaven.

That man is regarded in the Genesis narrative as the climax and the crown of Creation, with a nature distinct from and superior to all the creatures which preceded his appearance upon the earth, is indicated in a fourfold manner.

First, by the solemn terms which preface the record of the act of his creation and the nature assigned to him as the divine masterpiece—the “image and likeness of God.” “And God said, Let us make man in our image, after our likeness : and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth. So God created man in his own image, in the image of God created he him : male and female created he them.” (i, 26, 27.)

Second : Man's distinction from the rest of earth's creatures is

further indicated by the particular verb employed in the context : "God *created* man." (i, 27.) The verb בָּרָא (*bara*), "created," occurs only three times in the creation story. It appears first in the creation of matter (i, 1) ; second in the creation of animal life (i, 21) ; and third in the creation of man (i, 27). Man is thereby represented as a new creation. The word indicates that in him there is that which is not a mere evolution or development, but something essentially new and distinct.

Third : A further statement which emphasises man's uniqueness is conveyed in the solemn terms : "And God breathed into man's nostrils the breath of *lives* ; and man became a living soul." (ii, 7.) It is because his innermost self is the product of the inbreathing of the Spirit of God that man is distinguished from all other creatures of earth, occupying a unique position in the realm of nature. The Hebrew phrase literally rendered is "the breath of lives." It is convenient to regard man's constitution as twofold, consisting of body and soul. But, as St. Paul indicates in I Thess. v, 23, man has properly a tripartite nature, consisting of body, soul and spirit. He lives in three realms : the physical, the psychical and the spiritual. Through his body he has world-consciousness ; through his soul self-consciousness ; and through his spirit God-consciousness. In the physical realm he has the life of sensation ; in the psychical realm he has the life of intelligence ; in the spiritual realm he enters the life of Divine communion. It is surely significant that the word *bara* (created) occurs in the creation story just at the appearance of these three modes of being, the physical, the psychical and the spiritual.

With respect to the duration of time and the process of operation which resulted in the formation of man as he is, the Bible is significantly reticent. We only know in part. The question is sometimes asked, Are we to understand that the Almighty God formed man's body out of the dust "in a moment, in the twinkling of an eye," and then breathed into the material organism thus formed the "breath of lives" ? Or did He take some pre-existent animal shape which was not human to inspire it with his divine breath ? Tennyson suggested this when he wrote : "The Lord let the house of a beast to the soul of a man." All such questions are extremely speculative, and no completely satisfying answer is possible. It is, perhaps, of some significance that in chapter ii, 7, we read that the Lord God *formed* man of the dust of the ground. The word יָצַר (*yatzar*) translated

“formed” might be rendered “shaped” or “moulded.” Man’s body is said to be formed from materials which the earth already supplies. The ancient record thus states, what modern chemistry confirms, that all the elements which compose our physical structure are of the earth. At its dissolution in death the body returns whence it came—“earth to earth, ashes to ashes, dust to dust”; but the spirit returns whence *it* came—to God Who gave it.

The Genesis record, however, is obviously not concerned with man’s physiological origin; it is concerned to tell us his distinction, and his capacity for fellowship with the Divine. How precisely the Almighty God made man, nobody can say. But divine revelation asserts, what experience confirms, that He created him to be distinct, sovereignly superior, uplifted to a place of pre-eminence in the earth by reason of his kinship with his Creator.

Fourth: The differentiation of man and his absolute superiority in the realm of nature are further indicated by the divine beatitude which followed the act of creation, as recorded in the words: “And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.” (i, 28.)

Here, then, is the question: Can the above Biblical representation of man’s origin and nature be accepted as reasonably scientific, viewed in the light of the phenomena of nature and the facts of history? I submit that what the Genesis record presents, science, philosophy and history confirm. Man is unique, distinct from and immeasurably superior to all other creatures associated with him as inhabitants of earth. Universal experience of a fourfold order might be cited as evidence of the fact.

First: Man everywhere acts as from a deep-seated conviction that he is the sovereign lord in the earth. The zoological garden in every metropolis testifies to his mastery and control. The beasts are to minister to his needs. They are and were created to be his servants. This is universally assumed.

Second: The marvellous creative capacity of the human mind testifies to man’s kinship with the divine. Moderns point with pride to the locomotive engine and the steamship, to wireless telegraphy and television, to the aeroplane and the submarine, and a thousand and one other illustrations of man’s inventive genius and capacity for utilising nature’s forces—some of which,

like electricity, he only vaguely understands. The ancients, likewise, have left behind in the Pyramids of Gizeh, and the colossal temples and sculptures of Thebes, witnesses that remain as wonders of the world to the amazing potentiality of the engineering, designing, and creative capacity of the human mind.

Third: Man's universal religious instinct and yearning for contact with the unseen is ample evidence to confirm the Genesis record that he has a nature which is not wholly from the earth below. There is in him that which does not exist in any other earthly creature—a capacity for spiritual communion. "As the hart panteth after the water-brooks, so panteth my soul after Thee, O God,"* expresses the longing of the human spirit throughout the universe, however crudely manifest in regions where the light of the Gospel has not yet penetrated. Two thousand years ago, Plutarch, the Roman historian, referred to the universality of the religious instinct in the words: "If you travel through the world, well may you find cities without walls, without literature, without kings, not peopled or inhabited, moneyless and such as desire no coin, which know not what theatres or public halls of bodily exercise mean; but never was there, or ever shall be, any one city seen, without temple, church, or chapel, without some god or other; nay, methinks a man should sooner find a city in the air without any plot of ground whereon it is seated, than any commonwealth altogether void of religion."

Fourth: The consciousness of Immortality creates a gulf between man and all the inferior inhabitants of earth, which only the Genesis record can fully explain. The death of the body does not mean the end of life—so mankind has believed down the ages. For the pyramids are really only gigantic tombs erected to protect the mummies of Egyptian pharaohs, in anticipation of a resurrection from the dead and the life of the world to come.

A summary description of man's high and transcendent qualities is found in the eloquent lines of Shakespeare: "What a piece of work is man! How noble in reason; how infinite in faculty! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god!" And I submit that the Genesis record alone, in all the literature of the ages, satisfactorily accounts for that phenomenon.

* Ps. xlii, 1.

VI.—THE FORMATION OF WOMAN OUT OF MAN.

This section of our subject is by no means the least difficult. It is obvious that we are here on the edge of an ocean of mystery. For the record thus reads: "And the Lord God caused a deep sleep to fall upon the man, and he slept; and he took one of his ribs and closed up the flesh instead thereof; and the rib which the Lord God had taken from the man builded he into a woman, and brought her unto the man."*

There are three departments of this stupendous problem which need to be carefully examined. There is first of all the precise content of the Genesis record. What exactly does it say? Widespread misunderstanding requires to be removed. And secondly, there is the obvious problem of the origin of the sexes in general, and of the human sexes in particular. Thirdly, there remains the question of the *modus operandi* briefly but suggestively described.

With respect to the precise content of the Biblical statement, I suggest that the word "rib" is too specific as a rendering of the original Hebrew צֵלָה (*tsela*). The Hebrew word is never translated "rib" except here. In the Latin Vulgate it is rendered *costa*, which again may be translated "side," as evidenced by the French "côté" and the English word "coast." Further, the Hebrew word is used not less than seventeen times to describe the "side" of the tabernacle or the "side" of the ark of the covenant. In 2 Sam. xvi, 13, it occurs in the statement, "Shimei went along on the hill's side"; and in Job. xviii, 12, "Destruction shall be at his *side*." The only other occurrence of the word in the Old Testament is in the passage under review, where unfortunately the misleading rendering is "rib." The word "flank" would, I suggest, convey more clearly the idea involved. That a bare "rib" is not meant follows from the exclamation recorded in verse 23, "This is now bone of my bone, and flesh of my flesh."

Woman is one side of man. That, undoubtedly, is the idea which is intended to be conveyed. This interpretation may account for the fact, which Eusebius records, that certain Jewish rabbis had adopted the Platonic notion that man and woman were originally united in one body until the Creator separated them. Further, in the description of woman's formation,

neither the word "created" nor "formed" is used. A new verb בָּנָה (*banah*) which means "buidled" is now introduced. God, we are told, buidled up that which He took from the man in making man's counterpart and complement. The word "buidled" suggests a gradual formation by the hand of the divine Artificer.

Here is a revelation, though enshrined in a mystery, which meets a modern need. A pressing social problem to-day is that of the relationship of the sexes, and the sanctity of the marriage tie. In Genesis we are told the true relation between man and woman. They are not absolutely equal; one is but the complement of the other. One without the other is incomplete. Woman was created to be man's helpmeet. Her part is not to compete but to co-operate. In the Genesis story we read that when the woman was brought before him the man said, "This is now bone of my bones and flesh of my flesh; she shall be called אִשָּׁה (*issah*) because she was taken out of אִשׁ (*ish*)." The inseparable relation is revealed in the Hebrew as it is not in the English. Man needs woman because she has that which he lacks; the two together make a perfect unity.

No more serious social problem has arisen in our time than that which is associated with the increasing disregard of the sanctity of the marriage tie. Divorce is alarmingly on the increase. Human laws do not suffice to preserve the marital bond. Legal statutes can never prove a barrier against the lusts of the flesh. It is surely significant that Jesus Christ, the greatest social reformer whom the world has seen, in dealing with the problem of divorce, went back for His authority to this revelation in Genesis, when in answer to a question of the Pharisees He said: "Have ye not read that He which made them from the beginning made them male and female, and said, For this cause shall a man leave his father and mother and shall cleave to his wife: and the twain shall become one flesh? So that they are no more twain, but one flesh. What therefore God hath joined together, let not man put asunder." In such solemn terms did the Master describe the unity and indissolubility of the marriage bond, beginning with the Genesis narrative as the fount of Divine revelation and authority.

Second: We may clear some ground by asking Science the question, By what process in the realm of nature were the sexes differentiated? I refer to sex in general. Apparently, we are here confronted with an insoluble problem. Professor Julian

Huxley, in his *Essays of a Biologist*, writes: "The biology of sex is a vast subject . . . Of its origin we can only say that it is veiled in complete obscurity."*

The mystery of sex was deeply impressed upon my mind quite recently in a very unexpected manner. In August of this year (1936) I spent a fortnight in Prince Edward Island, in the Gulf of St. Lawrence. While there I paid a visit to the Laboratory and Testing Station, on the shore of Malpeque Bay, which has been established by the Canadian Government for the promotion of oyster culture in a district formerly renowned for the production of that particular shell-fish. There I was informed on the highest expert authority that an oyster which is male during one season may become female in the next, and *vice versa*!

The only approach towards an explanation of the Genesis statement concerning the origin of the human sexes lies, it seems to me, in certain analogies in the realm of nature. In the insect world male and female are frequently found joined together in one body; and it is well known that many minute creatures, such as the infusoria or animalcules, can sub-divide themselves by the method of "spontaneous fission", and increase thereby with marvellous rapidity.

A medical practitioner of high repute has said to me that he himself finds no insuperable difficulty in the Biblical record, especially when viewed from the standpoint of modern embryology. He proceeded to explain that every human body as it comes into the world passes through three stages. There is a stage in the development of the human embryo when it is non-sexual; there is a further stage when it becomes bi-sexual; and there is a final stage in the embryo when a sexual distinction takes place by some means absolutely unknown. Further, it is well known that in certain individuals this distinction or separation somehow fails to take place, with the result that there are human beings living on the earth to-day who are in part both male and female. Their condition may be said to represent the persistence of the second stage of embryonic development.

All this is merely suggestive; but it is not for that reason of little value. There is certainly a parallelism in nature which demonstrates that the Genesis record concerning the original distinction of the human sexes need not be regarded as unreason-

able or scientifically impossible. As to the method adopted at the first to produce such a division as that described in the Biblical text we know nothing, save that it is recorded that the operation was performed after the Lord God had caused "a deep sleep" to fall upon the man. That statement, at least, does not conflict with modern surgical experience.

VII.—THE GARDEN OF EDEN AND THE CRADLE OF THE RACE.

Half a century ago it was generally believed by historians that Egypt was the original home of civilisation. To-day, in the light of the most recent archæology, the source of culture and civilisation is traced rather to some district in Mesopotamia, where the Bible locates the cradle of the race.

According to the Genesis record, the original home of mankind was a garden eastward in Eden (ii, 8). "Eastward in Eden" does not mean in the eastern portion of Eden, but that Eden itself was to the east of the territory known to the Israelites. Its actual locality can, of course, only be vaguely determined. For we are dealing with a condition of things prior to the great catastrophe of the Flood (the historicity of which can no longer be questioned), which probably so altered the confirmation of the ground as to make precise identification impossible. Four rivers—themselves connected with one main stream—are indicated as boundaries of the district. Their names are Pison, Gihon, Tigris and Euphrates. The last two can be certainly identified. The characteristic products of the region, other than fruits and vegetable foods in abundance, were gold and pearls and precious stones.

Three eminent scholars, Rawlinson, Delitzsch, and Sayce, are at one in suggesting that the site is to be sought in Babylonia. Delitzsch placed Eden just above the site of ancient Babylon, where the Tigris and Euphrates approach to within a short distance of one another. On the other hand, some would identify the district with Armenia. The name of Eden used to be interpreted as being equivalent to Paradise—a place of pleasantness. But Eden was not Paradise. It is a mistake to speak of the Garden of Eden; the Bible refers only to a Garden *in* Eden. Eden was a district, and the "Garden" was a reserved enclosure therein. The Hebrew word *Gan*, translated "garden," means primarily a fenced-in portion. Modern Assyriology further

indicates that the Sumerian *Eden* or *Edin* means an elevated plateau or steppe; and it is thought that all the indications taken together point to a district in the mountainous plateaux of Central Asia, probably the land which is now called Armenia, where the Tigris and Euphrates, together with two other important rivers, find their source. Quatrefages, the distinguished French anthropologist, has affirmed that the study of peoples and languages has led scientists of authority, after due deliberation, "to place the cradle of the human race in Asia, not far from the central mass of that continent, and in the neighbourhood of the region where all the principal rivers which plough their way to the north, to the south, and to the east, take their rise." That statement should suffice to authenticate the Genesis record.

Man's innocence, immortality, and intimacy of communion with his Creator are conditioned by obedience to divine law explicitly expressed. There are trees in the garden of which man may freely eat; but there is one—the tree of the knowledge of good and evil—of which he must not partake; for to quote the command recorded, "In the day that thou eatest thereof thou shalt surely die." (ii, 17.)

Science makes no serious attempt to explore such a region as this. What interpretation, for example, can be suggested concerning the trees of the garden?

A helpful principle to recollect in Biblical interpretation is that a problem at the commencement of a revelation can often be best solved in the light of the truth which appears at its consummation. The Tree of Life in the Book of Revelation is described as bearing not "twelve manner of fruits," as the A.V. translates, but "twelve crops of fruit," as the R.V. renders. Thus it is a tree upon which abundant nourishment for the redeemed children of God will always be found—a guarantee of their immortality. Can we interpret such a source of Life everlasting as literally a kind of fruit tree? If not, then a literal interpretation need not be required concerning the Tree of Life, or the Tree of Knowledge of Good and Evil, in the garden in Eden. If the trees are symbolical in the N.T. Apocalypse, it is not difficult to believe that they were symbolical in this O.T. apocalypse in Genesis. Let it suffice to say that by partaking of one, perennial life was assured, while by abstaining from the other, purity of life was preserved, without dogmatising concerning the precise character of each.

Was man originally a savage? To that question the Genesis record certainly seems to return a negative answer. For we read that "the man gave names to all cattle, and to every beast of the field." (ii, 20.) To give names indicative of nature is what is now generally described as scientific classification, demanding a considerable degree of knowledge and intelligence. According to Genesis, then, man was not originally a savage, beast-like creature, roaming in the jungle, seeking his food by stealth and ferocity, as many apparently are pleased to imagine; but a being pure and innocent, placed in a rich environment, provided with a task suited to his condition. "To dress it and to keep it" describes the duty and responsibility placed upon man in the garden. There is undoubtedly a reference here to the arts of agriculture. According to Sir Ambrose Fleming, in a book recently published, "there is no evidence that Neanderthal or Palæolithic man had any knowledge of these arts."*

But this statement of the veteran scientist introduces two problems both closely associated with the Bible record. I refer to the alleged extreme antiquity of mankind, and to the undoubted remains of tools of a primitive kind which go back to a far distant past. To attempt a fully reasoned reconciliation in this sphere of our inquiry would demand much more space than the prescribed limits of this essay permit. But at least I can suggest a profitable line of investigation.

The genealogical tables of the fifth and eleventh chapters of Genesis are admittedly difficult of interpretation, as they were undoubtedly compiled upon principles only vaguely understood by us; and in all probability there are big gaps and omissions which make precise calculation impossible. The story of the Garden of Eden may be thousands of years older than Archbishop Usher's estimate.

But the supremely important consideration lies in the question, What is a man? Can we be certain merely by measuring the parts of a bony skeleton, which has been preserved from ancient days, that it represents man (*Homo sapiens*) as we know him? Dr. Rendle Short asks: "Are we quite sure that the geologists' flintmaker of Palæolithic times was a man in the Genesis sense?" And he proceeds to suggest, "There might conceivably have been pre-Adamite creatures with the body and mind of a man, but not the spirit and the capacity for God and eternity. If so,

* *The Origin of Mankind*, p. 138.

certain obscure references in Genesis become clearer. The old problem as to where Cain got his wife might be solved, also the strange reference to the sons of God marrying the daughters of men. (Gen. vi, 2.)"*

This line of inquiry concerning the existence of a pre-Adamite race of beings, not truly human, has been carefully pursued recently by Sir Ambrose Fleming. In his book referred to above he writes: "Let it be accepted, then, as a most probable or even certain deduction that a race of beings with faculties entitling them to be called 'Men', superior to the animal races, existed on this globe in and during a Palæolithic period. We have evidence in the remains so far found of Neanderthal Man that a race of such beings did exist; . . . But this race with its low mentality and psychical nature were unable of their own initiative to make any progress . . . We have seen that the appearance of animal forms on this earth took place by stages passing by degrees from the simplest forms of invertebrata to vertebrate types of fish, reptile, bird and mammal. If the method of Divine Creation is to proceed by stages from the simple to the complex, might it not apply also to the human as well as to the animal and vegetable kingdom, and that an initial stage in this work of the creation of man might have been a being, human in the sense of not being a product of the animal races, or generated from them by merely some automatic process, but with psychic powers superior to any animal?" And thus he concludes: "It is evident, then, that the Adamite was a new type of man made especially in the likeness of God, that is endowed with a spiritual nature having creative or constructive initiative power, and power of choice or free will, and greatly advanced intelligence and powers of language, as compared with any previous 'man'; able therefore to examine and understand and enjoy something of the work of his Creator, and able to hold communion with Him."†

Whether the suggestions of these two eminent scientists, who are both Christian believers, will be acceptable to the majority of my readers, it is difficult to say. They are assuredly worthy of careful consideration in the light of the fact that the Bible nowhere attempts to give us a complete record of Creation, or even a complete account of the origin of mankind. What it does profess to give is a sufficiently complete account of the

* *Ibid.*, pp. 56-7.

† Pp. 131-134.

story of the divine redemption of man made in the image of God. The limitations of the Biblical records must never be forgotten.

What is indisputable, however, is that the Genesis representation of man's original state is confirmed by universal tradition. Practically all the nations of mankind point to a golden age in the past. Greek and Roman literature is pervaded with the idea that there has been not an ascent, but rather a descent from a primitive condition of goodness, and happiness, and concord with the divine. Sir William Ramsay, after many years devoted to the study of classical antiquity, testified to the profound impression made upon him that the history of the Mediterranean world was mainly a sad story of degeneration and decay.

With all the available evidence before us the conviction grows that the great civilisations of the ancient world fail to present traces of an earlier period of barbarism, but rather the reverse. "In Egypt," wrote Rawlinson, "it is notorious that there is no indication of any early period of savagery or barbarism. All the authorities agree that, however far we go back, we find in Egypt no rude or uncivilised time out of which civilisation is developed." And, with reference to Babylon, he adds: "In Babylon there is more indication of early rudeness. But, on the other hand, there are not wanting signs of an advanced state of certain arts, even in the earliest times, which denote a high degree of civilisation and contrast most curiously with the indications of rudeness here spoken of."*

Since Rawlinson's time, moreover, the weight of testimony to the high culture of ancient days has greatly increased. Recent archæological discoveries have gone to show that cities such as Kish were founded in the central Mesopotamian Valley before 4000 B.C., and that pictographic writing, revealing a considerable degree of culture already attained, belongs closely to that period. Sir Leonard Woolley, in reference to his work on the site of Ur of the Chaldees, states definitely that "already, in 3500 B.C., the Sumerians had evolved a culture which was not only materially rich but as fully advanced as anything that was destined to replace it in Mesopotamia during some thousands of years."

Likewise, Dr. Stephen Langdon, Professor of Assyriology at the University of Oxford, in two letters to *The Times* in January and February, 1927, under the heading, "Wheat in

* *Origin of Nations*, pp. 13-14.

3500 B.C., a Discovery at Kish," described what he found in a fine red and black jar in a Sumerian house. "It proves," he wrote, "that wheat was one of the oldest cereals grown by early man, and can be dated at about 3500 B.C. from the pottery and pictographic tablets." Small quantities of this wheat were submitted to different expert authorities with the result that it now appears that "the most ancient Sumerians had succeeded in growing the finest kind of bread-making wheat and were far in advance of the agriculturists of pre-dynastic Egypt."

These testimonies serve to illustrate the weighty opinion of the eminent archæologist, Professor Sayce, which has been endorsed by a leading Canadian scientist, Dr. W. Bell Dawson, F.R.S.C., in the words: "Neither in Egypt nor in Babylonia has any beginning of civilisation been found. As far back as archæology can take us, man is already civilised, building cities and temples, carving hard stone into artistic form, and even employing a system of picture writing; and of Egypt it may be said, the older the country the more perfect it is found to be. The fact is a very remarkable one, in view of modern theories of development, and of the evolution of civilisation out of barbarism. Whatever may be the reason, such theories are not borne out by the discoveries of archæology. Instead of the progress we should expect, we find retrogression and decay; where we look for the rude beginnings of art, we find an advanced society and artistic perfection. Is it possible that the Biblical view is right after all, and that civilised man has been civilised from the outset?"*

VIII.—THE FIRMAMENT: AN ALLEGED MISTAKE OF MOSES.

A generation ago there were certain supposed inaccuracies in the Genesis record which formed a kind of perennial stock-in-trade for the critic and the sceptic. Three of these in particular were the creation of light before the appearance of the sun, the brief duration of the six-day period of creativity, and the formation of the firmament. With the first two of these I have already dealt. It now remains to examine the last of these alleged inaccuracies, based upon the statement in verses 6-7 of the first chapter which reads: "And God said, Let there be a firmament in the midst of the waters, and let it divide the waters

* *The Bible Confirmed by Science*, p. 141.

from the waters. And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament : and it was so."

The Biblical narrative, so the critics declare, represents the sky as a hard, metallic vault, in which the sun, moon and stars are fixed like electric globes attached to a ceiling. One might have thought that this assumption would immediately be dissipated by the statement which occurs later in the record, in verse 20, "Let fowl fly above the earth in the open *firmament* of heaven."

But, as a matter of fact, the idea expressed by the English word "firmament," from the Latin *firmamentum*, which does denote something strong and solid, is not found in the original Hebrew. The word there is רָקִיעַ (*raqia*), which means that which is stretched-out, attenuated, or extended. The verbal form of the root was used to describe the beating-out of gold into thin wires or threads fine enough to be sewn into the priestly garments.* The extremely thin gold-leaf which remains after the goldsmith has finished his task represents the *raqia* of the piece of pure metal with which he began. The noun, therefore, denotes extension. Hence, the R.V. rendering is "expanse," which is correct. The Hebrew is a strictly accurate term. The word "firmament" is a mistranslation due to the false astronomy of Alexandria in the third century B.C. The Greeks believed that the sky was a solid crystalline sphere. Hence the *raqia* of the Hebrew was rendered in the Greek Septuagint version by the word στερέωμα (*stereoma*), which was again translated in the Latin Vulgate by *firmamentum*, from which the A.V. word "firmament" was derived. Thus, what has been frequently exhibited as a blunder in the Biblical narrative proves to be the product of a mistake in the realm of science.

In verse 14, which reads, "And God said, Let there be lights in the *firmament* of the heaven," the Hebrew word is extended to embrace the whole region of the sky—that which we commonly call the ether—a substance, if we may so term it, which refuses to be precisely defined. Our own comprehensive use of the word "heaven" corresponds ; as when we speak of the birds of heaven, or the clouds of heaven, or the stars of heaven.

The Genesis description, therefore, is not inaccurate but marvellously precise. The Hebrew word *raqia* is an apt term

* e.g., Ex. xxxix, 3.

to describe either the ether, or that atmospheric expanse around our globe which so wonderfully separates the water vapour in the clouds above from the liquid water in the oceans below. This verbal exactitude in so ancient a document deserves respectful recognition.

IX.—EVOLUTION OR CREATION : WHICH IS REASONABLE AND SCIENTIFIC ?

This section of the subject has been dealt with so comprehensively in papers read before the Victoria Institute in recent years* that it would seem to be superfluous for me to do more than summarise the arguments advanced, especially as this essay is now approaching its prescribed limit. My endeavour is to demonstrate that the Genesis record of Creation is more worthy of credence than the modern theory of Evolution so widely presented as a substitute.

But what is meant by the term Evolution ? For the word is used with a variety of connotations, some of which are misleading. In the *Daily Telegraph* of 15th January, 1935, the writer of the leading article, commenting upon Sir Ambrose Fleming's vigorous challenge to the upholders of the unproved theory of man's evolution from the ape, wrote as follows : " He takes evolution to involve rejection of the idea of creation by Divine will and power. That has certainly been the contention of many raucous apostles of Darwinism. But it is quite illogical . . . Any rational belief in evolution demands the admission that under it, just as much as under the Mosaic cosmogony, organisms and electrons and the spirit may owe their existence to a Creator."

To realise the confusion of thought possible in this area, it is only necessary to compare that statement with the pronouncement of a distinguished naturalist, Professor D. S. M. Watson, which he made at the Meeting of the British Association in the year 1929, in these words : " Evolution was a theory universally accepted, not because it could be proved but because the only alternative, Special Creation, was clearly incredible."

Now that dictum has this value that it clarifies the issue. Dr. Watson sets Creation and Evolution at opposite poles ; so that if you accept one you *ipso facto* reject the other. Attempts are sometimes made to construct a kind of *via media* called

* Vide a list of these on p. 28, vol. lxxvii, *Journal of Transactions*.

Creative Evolution; which recalls the saying of that most brilliant scientist Clerk Maxwell, "I have looked into most philosophical systems and have seen that none will work without a god."

But for the present purpose we can accept Prof. Watson's alternative. My own response would be this. To declare that Special Creation is clearly incredible is just a piece of special pleading, which can never be conceded. On the contrary, it is far easier to believe that this wonderful cosmical order of things, which stirs the mind of man to wonder and admire, is the product of the thinking, planning, purposive Mind of an Almighty God than that it is the product of a series of accidental variations working impersonally, automatically, unguided from within, but how originated or maintained nobody knows.

When we descend from the contemplation of the universe as a whole to concentrate upon examination of some one particular part we realise how incredible is the theory of an evolution which is automatically directed. Who formed the eye? What made the ear? Darwin himself confessed that when he studied the marvellous construction of the eye he felt a cold shiver down his spine. "How the eye, with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection" caused him to wonder. But to such questions believers in a divine creation have a ready reply. The eye and the ear are the work of an all-seeing and all-hearing and all-powerful Deity. For it is written: "He that planted the ear, shall he not hear? He that formed the eye, shall he not see?" (Ps. xciv, 9.)

But recent scientific discovery is compelling many to retrace their steps in the direction of Creation. Now that the Nebular hypothesis of Laplace is being discarded, what theory concerning the origin of our solar system remains, if belief in a divine creation be rejected? Briefly this: The whole of our solar system was once just a vast spherical mass of matter. But a wandering star of great magnitude chanced to pass near it, with the result that a large lump or tidal wave was created in the solar mass. Then by gravitational attraction a long finger-like projection of matter broke off into various portions, which ultimately were formed into the planets, Earth, Venus, Jupiter and the rest. Could such an *accident* occur? Or is it easier

to believe that our system of a central sun, with moon, earth and planets revolving in precise orbits, has resulted from the operation of the directing intelligence of an Omnipotent Creator, by some manner and means altogether beyond our comprehension ?

An astronomer, speaking as representing his fellows, says : " To an astronomer the most remarkable and interesting thing about the part of the physical universe with which he has become acquainted is not its vast extent in space, nor the number and great masses of its stars, nor the violent forces that operate in the stars, nor the long periods of astronomical time, but that which holds him awestruck is the perfect orderliness of the universe and the majestic succession of the celestial phenomena. From the tiny satellites in the solar system to the globular clusters, the galaxy, and exterior galaxies there is no chaos, there is nothing capricious. The orderliness of the universe is the supreme discovery in science."*

Order, Design, Beauty, are manifest throughout the realm of nature. In human, terrestrial affairs order, design and beauty are not self-manufactured. Their existence demands intelligence. Can we really believe that they are automatically produced by chance, in the universal cosmos, without Intelligent Direction ?

Passing from the infinitely great we recognise that the Genesis record has received additional confirmation, in recent years, in the realm of the infinitely small. An arresting statement in that record reads : " The earth brought forth grass, herb yielding seed after its kind, and tree bearing fruit wherein is the seed thereof after its kind." (i, 12, R.V.)

According to Genesis, reproduction proceeds according to kind. The theory of Evolution, on the other hand, demands a perpetual process of reproduction *not* according to kind, but with continual variation, resulting in the transmutation of species in an ascending scale from the lowest forms of life to man the highest.

It is necessary to be on guard when we try to define a species. What, however, appears increasingly evident is that Nature has erected fences around certain orders of living organisms. Variation within the fence is possible ; but transmutation by gradual variation of the order of life within one fence to correspond to the living organism in the next fence has not yet been achieved.

* F. R. Moulton, *The Nature of the World and of Man*, p. 30.

Darwin himself confessed that he had never known one instance of transmutation of species to occur.* And as recently as May, 1933, Professor Fleischmann, in a paper read before the Victoria Institute, said, "No one can demonstrate that the limits of a species have ever been crossed."

Mendelism, which some affirm gave the death-blow to Darwinism, demonstrates that considerable variation can be produced, but always within the type. De Vries, the Dutch botanist, declares, "The constancy of Species is a demonstrated fact: their transmutability is still a matter of theory."†

The examination of what are called chromosomes in the cells of living organisms seems to indicate why it may not be possible for transmutation of species to take place. The chromosomes are rod-like bodies contained in the nucleus of the cell which determine the nature of the living organism to which they properly belong. A definite number of chromosomes can be found in each individual of a particular species. They are composed of bead-like elements called *genes*, strung as it were on a string. Thus the determinative principle of a living organism is deeply embedded within its structure. Hence there are many thoughtful students of science to-day who refuse to accept that theory of evolution which assumes the transmutation of species, until it can be verified that the chromosomes in the cell of one living organism can be gradually changed into the chromosomes which are characteristic of another entirely different organism.

Mr. Douglas Dewar, accordingly, writing as a zoologist, says: "By combining to make various molecules, the elements carbon, hydrogen, oxygen and nitrogen form a vast number of different compounds, but these all contain only the above elements, and no amount of reshuffling of these will give rise to a compound that contains any element other than the above four. We should expect to find the same results from the rearrangement of the parts of chromosomes and genes, and this is precisely what we do find. If a species be defined as a freely interbreeding community, no new animal species has yet been bred by any experimenter . . . There appears to exist no mechanism whereby a new type of organism can arise from an existing one."‡

When we consider the origin of the human species we recognise the superlative value of the Biblical revelation. According to

* *Life and Letters*. vol. iii, p. 25.

† *The Mutation Theory*, p. 205.

‡ *Man: A Special Creation*, pp. 108-9.

Genesis, there is an unbridgeable gulf between man and the rest of the animal creation. The reasons I have already stated.* During the past half-century, however, persistent attempts have been made to demonstrate man's descent from the ape or from a common ape-like stock. With what result? Professor Virchow of Vienna, the renowned anthropologist, said not long before his death: "Twenty years ago it was hoped that the idea of Descent in its extreme form would be victorious. There was a great expectation that man's descent from the ape or some other animal would be demonstrated. In vain have the links which would bind man with the apes been sought. Not a single one has been recorded." That such gaps actually exist Sir Arthur Keith admits when he says: "The fossil forms which represent this stage in the evolution of anthropoid and of man have not been found; their existence is inferred."

It was in reference to the lack of substantial evidence for the theory of man's kinship with the apes that Sir Ambrose Fleming made the spirited protest, which occasioned such widespread comment in January, 1935. To quote from his book, *The Origin of Mankind*, he said: "It is entirely misleading and unspeakably pernicious to put forward in popular magazines or other publications read by children pictures of gorillas or chimpanzees labelled "Man's cousin" or "Man's nearest relative," or to publish perfectly imaginary and grotesque pictures of a supposed "Java man" with brutish face as an ancestor of modern man, as is occasionally done . . . Neither is it justifiable for preachers in the pulpit to tell their congregations that there is general agreement amongst scientific men as to the evolutionary origin of man from an animal ancestor."

In support of his contention he adds: "Mr. H. F. Osborn, the learned Director of the Natural History Museum of New York, U.S.A., not long ago contributed an article to an American review entitled *Human Biology*, under the title 'Is the Ape-Man a Myth?' and he answers the question in the affirmative." Further, he quotes the opinion of Dr. Albert Fleischmann, Professor of Zoology in the University of Erlangen, that "Darwin's scheme remains to this day foreign to scientifically established Zoology, since actual changes of species by such means are still unknown."†

In his Presidential address to the Victoria Institute, the subject

* *Vide* pp. 43-47.

† Pp. 75, 82.

of which was "Modern Anthropology versus Biblical statements on Human Origin," Sir Ambrose issued a challenge, which was widely reported, in the question: "If, then, there is such a sharply-marked difference between the animal mind and the human mind, the problem the evolutionist has to face is to explain how it comes to pass that if man and the anthropoid apes have a common ancestor, all the above astonishing powers and faculties should be present in ever-advancing degree in man, and totally absent in the collateral animal the ape."

The response was illuminating since it illustrated the lack of substantial evidence on the other side. Two notable replies were reported. One was from Sir Arthur Keith. In an interview with the correspondent of the *Daily Telegraph* he said, "I do not know. Why is a Sir Isaac Newton born in one family and an idiot in another? What light has Sir Ambrose to throw on that?" As a biologist Sir Arthur should know that there is no true analogy between aberrations within a particular species and the marked differences which characterise two entirely different species.

The other reply was from Sir Grafton Elliot Smith, Professor of Anatomy at University College, London. He said: "When Sir Ambrose comes out with all his dogmatic statements it is difficult to answer them straight away, but he is evidently quite unaware of what has happened in recent years. . . . Some of my own assistants at University College Hospital carried out vitally important experiments to determine visual discrimination of the baboon. They were able to show that the baboon has powers of visual discrimination of exceptional precision. The creature could pick out colours that a good many shop people could not distinguish—subtle shades of grey not appreciated by ordinary salesmen. It is difficult to say where these experiments might have stopped, but the baboon eventually killed itself by twisting a chain round its neck!"

It is now plainly evident that evolution can only be presented as a philosophical theory: it is not an accredited scientific fact. Sir J. Arthur Thomson has declared that "the naturalists of to-day are not so intellectually comfortable as their fathers were in declaring a result to be 'the outcome of evolution'." And Professor Bateson, in the Darwin centenary volume, wrote that "no one can survey the work of recent years without perceiving that evolutionary orthodoxy developed too fast, and that a great deal has got to come down."

The final question then is this: Which is more reasonable and more truly scientific, Chance or Design: Evolution or Creation? This is not a case of science versus religion. On the contrary, Lord Kelvin, a master mind in the realm of science, once said in words which may now be regarded as prophetic: "I feel profoundly convinced that the argument from design has been greatly too much lost sight of in recent zoological speculations. Overpoweringly strong proofs of intelligent and benevolent design lie around us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us through nature the influence of a free will, and teaching us that all living things depend on one everlasting Creator and Ruler."

X.—BIBLICAL ANTICIPATION OF MODERN DISCOVERY.

The creation of light before the appearance of the sun; the beginnings of vegetation in the absence of sun-light; the fixity of species; the biological order of creation in the vegetable and animal kingdoms; these are some of the details in the Genesis cosmogony which not only reveal the scientific exactitude of the record but illustrate how it has anticipated the findings of modern discovery.

The Greeks, who may be said to represent the flower of the culture of the ancient world, believed both in the spontaneous generation of life and in the eternity of matter—two beliefs directly opposed to the Biblical revelation. Aristotle taught that fleas and worms, mice and frogs were engendered spontaneously from the moist earth. Virgil believed that bees were produced by the putrefaction of the entrails of a young bull. And such false notions have long persisted. A celebrated French physician in the reign of Louis XIV, Van Helmont, taught that herbs could be transformed into scorpions. Even in our own generation eminent scientists have been keen to embrace the idea of spontaneous generation, some declaring it to be "a philosophical necessity" of the doctrine of evolution. T. H. Huxley, misled by Haeckel, at one time was prone to believe that life was spontaneously generated in a slimy substance which he termed *Bathybios*, supposed to exist at the bottom of the ocean. Others claimed to have developed life from non-living matter; but Pasteur exposed the falsity of their experiments.

“There is no circumstance,” said he, “known to us to-day which justifies us in affirming that microscopic organisms have come into the world without germs, without parents like themselves. Those who make this assertion have been the playthings of illusions or ill-made experiments invalidated by errors which they have not been able to appreciate or to avoid.”*

The Greeks, likewise, believed that matter was eternal. The cosmos was produced by a fortuitous concourse of atoms, but the atoms apparently had never a beginning. How vastly different from the concepts of modern physics! We are being told that “electricity is now known to be molecular in structure.” And, moreover, Jeans, Eddington and others are demonstrating that the universe is growing old, and cannot last for ever. “Energy,” says Jeans, “cannot run downhill for ever, and like the clock-weight, it must touch bottom at last.” The obvious inference, of course, is that at some time in the remote past the clock-weight must have been wound up; that there has been a creation.

How marvellous is the Genesis record! How did the writer escape the pitfalls of the scientists and philosophers who have investigated and theorised down the centuries from his time to ours? In the Mosaic cosmogony there is nothing absurd or grotesque, like the representation of the earth resting on the shoulders of an Atlas, or supported by an elephant resting on the back of a tortoise!

The Genesis relation has stood for over three millenniums. It was written a thousand years before Herodotus “the father of history” was born. What changes in the realm of science have meanwhile been recorded! This monument of eternal truth—that there has been a divine creation in the beginning, that life has proceeded from life and is not spontaneously generated, that man has a nature partly from above and partly from below—has remained erect above the changing mists of human philosophy—a miracle in the realm of literature, and a perpetual challenge to scepticism and unbelief.

XI.—CONCLUSION: A BASIS OF SCIENCE FOR RELIGION.

If I might venture to expand the title of this essay, I would say that in Genesis we have a sure basis of science *for religion*,

* Quoted by Price, *A History of Some Scientific Blunders*, p. 64.

Bearing in mind the simplicity of its diction and the brevity of its narration, all we have a reasonable right to expect is a general correspondence between its content and the accredited results of modern science. He would be a bold man who would dare to deny that such a correspondence exists. The discoveries of the past quarter of a century have undoubtedly tended to confirm the declaration of the renowned geologist, Sir J. William Dawson: "The order of that vision of the creative work with which the Bible begins its history is so closely in harmony with the results worked out by geological investigations that the correspondences have excited marked attention and have been justly regarded as establishing the common authorship of nature and revelation."

To that might be added the testimony of Cuvier, Dana, Guyot, Stokes and other masters in the realm of science. W. E. Gladstone took double first-class honours in the University of Oxford. Through many arduous years he occupied the responsible position of Prime Minister. He was a voluminous reader and a profound thinker. In the maturity of his powers he wrote a book called *The Impregnable Rock of Holy Scripture*, in which he referred to the Genesis cosmogony in these terms: "For myself, I cannot but remain impressed with the profound and marvellous wisdom, that has guided the human instrument, whether it were pen or tongue, which was first commissioned from on high, to hand onwards for our admiration and instruction this wonderful, this unparalleled relation . . . an inestimable treasure."*

In the welter of nineteenth-century agnosticism Gladstone found there a foundation of "impregnable rock" upon which to rest his ladder of faith by which to rise to the highest exercise of which the human soul is capable—fellowship and communion with God. And for that purpose alone was the Genesis revelation divinely given.

DISCUSSION.

The PRESIDENT (SIR AMBROSE FLEMING) (in the Chair) said: I feel sure that all present will desire to express to Dr. Hart-Davies our cordial thanks and appreciation of his kindness in coming to us once more with one of his very interesting and informing papers.

His address comes indeed at the present time very appropriately and on a subject of vast importance. Some of those present have

* P. 77.

no doubt seen the remarkable document called The Report of the Commission on Christian Doctrine appointed by the Archbishops of Canterbury and York in 1922. At any rate probably most here to-day have seen the copious correspondence in The *Daily Telegraph* called forth by it. This report is signed by twenty eminent men, bishops and laymen, and professes to give an epitome of opinions that are held, or may be held, by members of the Church of England concerning the verities which constitute the Christian faith. This is not the time to enter into any criticism of the Report as a whole, but one statement in it merits our attention because it deals with the subject of the paper of Dr. Hart-Davies under discussion. After an assertion that the Universe depends on the Creative Will of God, the report says (p. 45): "It is to be recognised that the Christian doctrine of Creation as thus generally stated leaves abundant room for a variety of theories as to the evolution of the world. . . . No objection to a theory of evolution can be drawn from the two Creation narratives in Genesis i and ii since it is generally agreed among educated Christians that these are mythological in origin and that their value for us is symbolic rather than historical."

This is a most astonishing statement to be issued by those who at their ordination have confessed their unfeigned belief in all the canon of Scripture and especially have expressed their readiness to banish and drive away all erroneous and strange doctrines contrary to God's word.

It amounts to saying that we may dismiss the plain statements in Genesis i, 27 that God created man in His own image, or that in Genesis ii, 7 that the Lord God formed man of the dust of the ground and breathed into his nostrils the breath of life as literally true and replace them by the Darwinian or any other theory that man has been evolved from the animal races by natural processes of development.

It is to be hoped that the members of this Commission would not deny to the Members and Associates of the Victoria Institute the right to be called "educated Christians"; yet in the last ten years we have had many papers here from competent authors which have carried conviction to our members that spontaneous evolution of either animal or man is an improved theory.

It is a most astonishing thing that the eminent signatories to this Report have not found time in the fifteen years they have been sitting together to read up at least a little of the abundant anti-evolution literature.

It is not merely a question of religious faith. Eminent naturalists such as Sir J. W. Dawson and his son, Dr. Bell Dawson, Sir Charles Bell, St. George Mivant, Professors Vialaton, Fleischmann, Geddes, D'Arcy Thompson, W. Bateson, McCready-Price, L. S. Berg, Mr. Etheridge, and many others have dissented from the Darwinian theory on scientific grounds only and no other theory has been stated in such detail as to secure wide support.

Darwin himself did not believe in his complete demonstration of it. In his *Life and Letters*, published by his son, Francis Darwin, Vol. III, p. 25, is a letter of C. Darwin replying to a request of Mr. G. Bentham for proof of it. He says: "In fact the belief in Natural Selection must at present be grounded entirely on general considerations; when we descend to details we cannot prove that a single species has changed."

A. R. Wallace, a contemporary of Darwin, denied that evolution could account for man's mental, ethical or spiritual qualities, and T. H. Huxley gave a reluctant consent. Hence to offer to the public any choice of evolutionary theories of man's origin in place of the definite statements of Divine Creation is to offer them a stone in place of bread.

The instantaneous creation of Man or of Woman is not to be dismissed as "incredible" or "impossible" in view of many acts of immediate Creation in the miracles of Christ. But if the former are held in doubt it weakens faith in the latter. Accordingly the treatment of the subject of miracles in the Report "is sicklied o'er with the pale cast of thought," and the Virgin Birth, the bodily Resurrection, and the Ascension of our Lord are all mentioned as if belief in their literal truth could be suspended. St. Luke tells us in the preface to his Gospel that his object was "that thou mightest know the certainty of those things wherein thou hast been instructed." There is much, however, in this Report which seems to encourage uncertainty.

At the present time the effort seems to be to couple the words Evolution and Creation together in such phrases as "Evolution is a method of Divine Creation."

But this involves hypothesis. We do not know whether the acts of Creation in Genesis i and ii were instantaneous or gradual. Nor is any definition given in the above statement as to the nature of such assumed evolution. These narratives were not intended, as Dr. Hart-Davies has said, to give us detailed information as to Creative acts. Indeed, we might not be able to understand them if given. They give us absolute truth on certain great facts of man's creation and fall and the promise of a redemption by the seed of the woman and the coming of a second Adam, who is the Image of the Invisible God, who would triumph where the first had failed.

I will ask you therefore to signify your agreement with the vote of thanks to Dr. Hart-Davies I have now the pleasure to propose. I can then declare the subject open for discussion and will ask those who desire to speak to come up to the table and give their names in writing to Colonel Skinner.

Mr. SIDNEY COLLETT said: Mr. Chairman, it seems almost ungracious to criticise such a paper as we have just listened to. But I humbly suggest that our learned lecturer and many other scientists fall into two errors over this first chapter of Genesis. First, they speak of the six "days" mentioned in that chapter as the Days of "Creation." Secondly, they say those "days" were not natural days of twenty-four hours such as we know them, but that they represented long periods of time.

Now, not only are those "days" never called Days of "Creation" in Scripture; but, on the contrary, the very first verse of Genesis i tells us plainly that the "Creation" of the heavens and the earth took place "in the beginning"—a timeless date which no man can measure. And there our scientists may have as many millions of years as they like. But that word "created" is never used again in the whole of that chapter in relation to the earth: it is only used in relation to animal life, v. 21, and man, v. 27, which of course God did then "create."

Verse 2, however, which describes the earth as being "without form," etc.—"waste"—is the real word, see R.V.—clearly indicates that some great catastrophe must have occurred after the original "creation" mentioned in verse 1, for the two following reasons:—

First, the Holy Scripture in Isaiah xlv, 18, distinctly declares that "He (God) created it (the earth) *not* 'waste.'" R.V. the exact word that is used in Genesis i, ii. Indeed the earth must surely have been most beautiful when God first created it.

Second, that the word "was" in verse 2 should be rendered "had become" or "became." It is precisely the same word in the original as that used in Genesis xix, 26, where we read that Lot's wife "became" a pillar of salt. She was not originally a pillar of salt, but became such after the catastrophe that occurred owing to her disobedience in "looking back." So with the earth. It was not created without form or waste, but "became" so afterwards.

Hence, the rest of the chapter deals not with "creation," but with what may be described as the reconstitution of the earth from that condition of waste, to make it suitable for the dwelling-place of man.

All this seems to be made quite clear in verse 9, where it does not say that God "created" the waters—they were already "created," but merely that "God gathered the waters together into seas, and the dry land (or earth) appeared." The earth, like the waters, had already been "created" as stated in verse 1. So with the sun. Genesis i, 17, tells us that on the fourth day God "set" the sun in its relation to the earth. He did not then "create" it; it was there already. But on the fourth day He "made" it (Genesis i, 16) in a fit condition to give light and heat to this earth.

A careful observance of the way in which the Holy Spirit uses the words "created" and "made" throws much light upon this question. To "create" is to make something out of nothing; but a thing is "made" out of some existing material.

Now, the "period theory" held by the learned lecturer lands us into very troubled waters. I have collected a list of the calculations of eleven of the most eminent scientists as to the length of the period supposed to be covered by the six days mentioned in Genesis i, and I find that no two of them agree! Professor Ramsey, who gives the longest time, makes it 10,000 million years! And Professor Tait, who gives the shortest time, makes it 10 million years!—a somewhat staggering difference of more than 9,900 million years! While the latest figures are those of Professor Sollas and Sir George Darwin, who calculate those six "days" to have lasted about 60 million years, making 10 million years for each "day."

Now, I wish to call special attention to the following: There are six things said about those days of Genesis i. There was "evening and morning"; there was "day and night"; there was "darkness and light"; and I ask what meaning could such words have unless they referred to ordinary days such as we know them. Moreover, we read: "God divided the light from the darkness"; and "God called the Light, day, and the Darkness called He, night." (Genesis i, 4 and 5.)

Is it conceivable that the Holy Spirit would use words and expressions in the Bible describing, in the most minute detail, the constitution of ordinary days and nights exactly as we know them, while all the time meaning something entirely different, viz., vast periods, lasting many millions of years? Moreover, as I have shown, according to the period theory, each day, lasting 10 million years, one half of which God called "Day," must have had 5 million years of unbroken light, and the other half which God called "Night," must have had 5 million years of unbroken darkness!

Seeing that we read of trees and herbs on the third day, fish and fowl on the fifth day, and animals and man on the sixth day, I ask how could life of any kind exist under such conditions? But after all, does not the Bible explain itself in this matter? In Genesis ii, 3, we read of the work which God "created" and "made," or literally "created to make." Does this not clearly imply that the Almighty foresaw that, after His original "Creation," as recorded in Genesis i, 1, which must have been perfect, a great disaster would occur, which would bring the earth into a state of "waste," as mentioned in Genesis i, 2, necessitating its being reconstituted or "made" fit for the dwelling-place of man?

This I believe is the true interpretation of Genesis i.

I therefore agree with G. H. Pember when he says: "*It is clear that we must understand the six days to be periods of twenty-four hours.*"

Mr. H. W. BRYNING said: Dr. Hart-Davies is to be congratulated on his able and interesting paper. But I submit that his exposition of the ordinance, "Let there be light," as the first creative fiat, teaches that light itself was created.

Light, as an emanation from the sun (or central incandescent mass), existed when the earth was enveloped in the thick darkness

referred to in Job xxxviii, 9—where Job is put a pertinent question connected with the making of the earth. The question (in verse 4) is, “Where wast thou when I laid the foundations of the earth?” and the descriptive reference reads: “When I made the clouds the garment thereof, and thick darkness a *swaddling*-band for it.” The italics are given here to stress the expression “swaddling,” which obviously indicates the period when the earth was very young, and compares it to the infant stage in man.

I quote the testimony of Job, as it is a Divine exposition of the stage in the making of the earth when it was figuratively born and literally brought from darkness into light. For it is written, “And the Spirit of God moved upon the face of the waters. And God said, Let there be light.” (Note the conjunctions here, as well as those all through the narrative of the Creation, which should point to the unity of the whole as a single and singular work, in the preparation of a world for the sons of God.)

To my mind the second and third verses of chapter i are as inseparable as chapters i and ii. Because the words quoted above indicate that a cataclysm was ordained to prepare the way for the passage of light to the *face of the waters*. Hence the fiat, “Let there be light.”

On page 34, Dr. Hart-Davies refers to the stage when a planet is covered with water and cloud, and there is a distinction between light and darkness, before the clouds part to make the sun and moon visible from the earth. But his conclusions regarding the state of the glowing mass which is now the sun, are unsupported by the text and are incompatible with the Nebular hypothesis. For the text states that the sun was the greater of the two great “lights,” the other being the moon. So that both were fully formed as orbs. This agrees with the Nebular hypothesis, while the activity of solar radiations are obvious in the earliest geological formations.

It is therefore evident that the light of the first three “days” was diffused sunlight, which has continued ever since to distinguish day from night, and enabled plants to grow during the third “day” of Creation before the advent of direct sunshine. Nature demonstrates the possibility of germination in the absence of sunshine in many places upon the earth to-day, notably Cherrapungi and

the dense tropical forests, where there is always vegetation among the mists and shadows.

Dr. Hart-Davies holds the common belief that the first verse of Genesis relates to a remoter beginning than the genesis of the earth which is clearly indicated in the juxtaposition of the words " heaven " and " earth " in the text. I venture to say here that this belief is not in keeping with the purpose of the revelation, which is clearly an introduction to the Creator of this world, and the narrative which details the order in which every thing, visible and invisible, was made by Him.

In his introduction to this essay, the learned doctor remarks that there are three marked characteristics in the narratives of the first two chapters of Genesis, viz., brevity, simplicity, and religious purpose. Taking these into consideration, it may be perceived that there is no warrant for the assumption of any other beginning than that of the genesis of the solar system, within which man is shown the genesis of the sun and moon and the earth, while the purpose of his existence upon the latter is told in the second chapter of Genesis.

The heaven and the earth which God created in the beginning is appropriately described as the Nebular Theory, which is the most valuable contribution ever made by science in support of the Bible as a basis of science and religion. Why does modern science reject it for the Planetesimal Theory ?

The Nebular Theory is justified by the Genesis record and a warrant for this conclusion may be read in the significant statement at the foot of verse 16, where the two great lights are brought into the narrative of the fourth " day." Thus we learn that the other lights are for signs and for seasons, and for days and years are grouped under the simple but very illuminating remark,

HE MADE THE STARS ALSO.

Dr. J. BARCROFT ANDERSON said : It is not clear to my mind that this book (of which Moses is stated to have been the amanuensis in II Chronicles, xxxiv, 14) was given, or intended to be given, to the world.

It is now a treasured source of information to the Ecclesia of God. To such as are of that ecclesia I desire to say a few words.

“Who the Son is, knoweth none save the Father,” are words our Lord uttered on earth. (Luke x, 22.) John knew that he was Son of God (builder-up of God). But who the Son of God was, he did not know. After His resurrection our Lord opened the understanding of His disciples. Then John knew that He Who expired upon the Cross was the same Who in six days made the heaven and the earth, the sea and all that in them is. (John i, 3.) Knew that it was He whom Isaiah beheld in the Temple when Isaiah said: “Mine eyes have seen Jehovah of Hosts.” (John xii, 41.) After the resurrection Paul knew that the Creator of all things had nearly (paraplesios—Heb. ii, 14) partaken of blood and flesh, in order that by the death He might destroy him that had the power of the death.” It was then he knew that He Who expired on the Cross, as stated in Colossians i, 15, was “Image of the God, the Invisible, First Formed of all formation, because by Him were formed all things.”

We are now considering in these two chapters the words of Him, Who afterwards taking-hold-upon-for-Himself of a seed of Abraham (Heb. ii, 16), expired from it upon the Cross. Words He dictated to Moses in the Wilderness. They contain fourteen quotations of words He actually spoke on earth, before Adam was. A language exclusively divine. That language from which all others at Babel generated and degenerated. Nor can I detect that this language was altered as spoken through the latest of His Hebrew prophets, or by the angel in the last chapters of Daniel.

But by the human translations of God’s Word written, we have all been misled. Some of the consequent misbeliefs were not serious. The garden God planted was BY, not IN, Eden. Eden means “Inlet” עֵדֶן—ODN. It was the Persian Gulf, out of which went a river to water the garden, and having watered the garden, it spread out to be four heads. (Gen. ii, 10.)

The mistranslation of Genesis ii, 4 was caused by accepting as authoritative the letter E which the scribe inserted בְּהִבְרָאם—BEBRAM. But he made his inserted letter smaller than any other letter in the book, and left a marginal note to indicate what he had done. Yet even with this added letter the verse should read: “These origins—the Heaven and the Earth by their being brought into physical existence. By day shaping them, Jehovah Elohim, earth and heaven, and every bush of the field before it was existing by earth,

and every herb of the field before it grew." Before I studied this verse I thought some of our Lord's work was done by night. I have taken the word עֲשׂוּת—OSUT as Davidson takes it in Ezekiel xiii, 18, active participle, feminine plural.

As a result of the stimulus Dr. Hart-Davies' paper has given to my study of the question, I have come round to the conviction that in Scripture the word DAY is always used as in chapter one, verse five, as the equivalent of LIGHT, meaning a period of light following darkness. In John vi, 40, we read: "every one who perceiveth The Son, and placing his trust in Him, should have life eternal, and I will raise him up with the last day." That day is last, because it endeth not. (Rev. xxii, 5.)

The length of the fifth and sixth days must have been determined by the rotation of the earth, for the sun was then in the sky. And if in the earlier days it was the earth which divided between the light and the darkness, then also its rotation decided their duration.

After twelve years' research into the subject I have been unable to find any proof, or attempted proof, that has been put forward to prove the physical matter of this earth to have been existing for as long as eight of our days prior to Adam's creation. There have been mountains of insinuation, but proof none.

Isaiah xlv, 18, appears to have always been mistranslated by placing a stop after "He established it" and by transposing the words "not in vain" and "He created it."

The lecturer has referred to things which are outside the scope of these two chapters. The presence of fleas on earth is explicable by a more exact translation of Genesis iii, 17 and 18. The presence of saurian reptiles by Genesis vi, 12. And of anthropoids, by crossing, such as that referred to in Jude, verse 7. None of these forms of animal life can we understand to have been pronounced GOOD, as were those detailed in verses 22 and 26 of chapter one.

Mr. G. BREWER said: I am sure we must all feel very much indebted to Dr. Hart-Davies for his interesting and instructive paper, with his support to the scientific and historical accuracy of the first two chapters of Genesis; and to such an excellent paper, one naturally hesitates to sound any discordant note. But lacking

the advantage of a scientific education, I find a difficulty in accepting his view that the first verse of the first chapter is a summary of the events recorded in the subsequent verses of that chapter.

Verse 2 states : And the earth was without form and void (*tohu* and *bohu*). Dr. Young in his literal translation renders this passage "hath existed waste and void." The same words in the original are used in Jer. iv, 23, "I beheld the earth, and lo, it was without form and void." The word "*tohu*" is rendered in Isaiah xxiv, 10, xxxiv, 11, and xli, 29, as "confusion" and in Deut. xxxii, 10, as "waste." In Isaiah xlv, 18, we read "He created it not in vain" (*tohu*). If therefore God created the earth perfect, how did it come to be waste and confusion, except as the result of severe judgment ? The 28th chapter of Ezekiel would appear to supply the reason in the fall of Satan. Job ix, 4-7, probably refers to this overthrow and the resulting darkness, when he speaks of God removing the mountains in His anger, shaking the earth in its place, speaking to the sun that it rise not, and sealing up the stars.

This catastrophe would confirm the truth of the suggestion on page 39 of the paper, that there might conceivably have been a race of pre-Adamite creatures. These being involved in the rebellion of Satan, would have perished in his overthrow.

With regard to the suggestion on pages 35-38 that the six days represent vast periods of time, each divided into two long intervals, one all darkness and the other all light, the question arises, what became of the grass, plants and trees created on the third day, when the evening, or darkness of the fourth day, set in ? To have passed through such a period of darkness would have destroyed completely the vegetable creation. Yet we find that it not only survived but was on the sixth day appointed to be the food of man and animals. After the fourth day, when the sun and moon were visible, we read that they were appointed to divide the day from the night ; and to be for signs, and for seasons, and *for days* and years. Thus, I see no reason why we should suppose *these days* to have been longer than the present day of 24 hours.

On page 52, paragraph 3, the suggestion is made that the trees of the garden were symbolical. That truths are here symbolized will, I think, be generally admitted ; but as the fruit of these trees, with the exception of the Tree of the Knowledge of Good and Evil,

were given to man for food, it is difficult to see how they could be merely symbolical.

Mr. W. H. DRURY YULE wrote: This is a paper marked by considerable scholarship and breadth of understanding, but I am somewhat dismayed to find that it does not apparently deal with the subject mentioned in the title, but rather its reverse aspect. Instead of considering the first two chapters of Genesis as a "basis of science," it expounds their "scientific accuracy" (para. 2), an operation which involves the interposition of an external standard—the very negation of a satisfactory "basis of science." Only in one short and not very enlightening section (X) does the writer really deal with his subject.

There are many points in this paper that call for criticism or comment, but I can only refer here to a few of them briefly.

The remark that "all light is not of the same nature" is not clear; surely there is no fundamental difference save that of wavelength. The arguments regarding "sunlight" are a little incongruous when אור is used of lamps (Jer. xxv, 10), the "sneezings" of leviathan (Job xl, 18), and of a person's face (Job xxix, 24)!

In the paragraph dealing with יום, it is remarkable that for a word occurring nearly 2,300 times in the O.T., and in a wide variety of contexts, recourse has to be had to examples from modern life and the N.T. (where the words used are *Greek*, not Hebrew).

I am glad that attention has been drawn to the slender basis on which the "catastrophe" theory rests. This theory does violence both to the Hebrew (if some such sense as "became" were really intended, we should at least expect the *niphil* form of the verb) and to all that we know from scientific researches, nor has it any clear support elsewhere in the Scriptures, except by a strange manipulation of the Greek *καταβολῆς κόσμου* in the N.T.

Does not the key to these opening verses lie in the various verbs that are used in the original? The author of this paper has evidently appreciated the distinction between ברא and עשה, but he would have done well to have carried the principle of discrimination further. I feel sure that much real light would result from a careful study of the diverse Hebrew terms employed in this chapter.

The argument from "breath of *lives*" (ii, 7) is rather far-fetched. The learned writer must surely know that the Hebrew noun "life" is never singular! The selfsame expression is applied to fowls and creeping things at i, 10. It should also be noted that vi, 17 and vii, 22 imply that others than man possess "spirit."

In connection with the remarks on ii, 23, it seems to me that the narrative implies a feeling that אִשָּׁה is derived from אִישׁ by a formative akin to הֶ-*locale*, giving the primary meaning of "towards-man"—a very natural affinity for one "taken from" man.

The explanation given of the differentiation of the sexes is interesting, but it must be remembered that analogy is the least certain or valid of arguments; nor must it be overlooked that sex is a chromosomic function, determined at the moment of conception, and that all available evidence points to the respective sexual glands being mutually inhibitory in their influence, so that a bisexual individual would be functionally asexual, and would probably also be an emasculated travesty of mankind. I believe that I am correct in saying that insects, which Dr. Hart-Davies instances, have no endocrine system controlling bodily development as have mammals, but that "sex" is present in each individual cell of the body, so that "mixed sex" in such cases is not surprising. This is a field where we must tread warily, and refuse to form premature conclusions.

With reference to Eden and the "home of civilisation," no mention is made of the recent reaction by the Smith-Perry school of ethnologists in favour of an Egyptian origin, nor to Dr. Yahuda's researches. The statement that "the Bible refers only to a garden *in* Eden" is singularly original. How would the author of this paper venture to translate גִּיְעָרַן at Gen. ii, 15; iii, 23, 24; Ezek. xxxvi, 35; and Joel ii, 3? I deplore the growing tendency among expositors, of which this is but a glaring example, to set one passage against the plain statements of many; the Scriptures can be made to mean or say anything by this method of exegesis. A question that all Bible students should ask themselves is whether עֵדֶן is necessarily to be understood as a place-name. The meaning of the word is "luxury" or "delight," and the Septuagintal translators have rendered it by τρυφή in Ezek. and Joel, and by παρὰδεισος in Isaiah. I feel that there is much to be gained

by understanding it as a reference to the *nature* of the "garden eastward." The supposed connections with an Assyrian *edinu* are not at all convincing. (This does not, of course, apply to the occurrences at II Kings xix, 12, Isa. xxxvii, 12 and Ezek. xxvii, 23, where the Masoretes have in any case pointed the word slightly differently.)

To say that Adam gave "names indicative of nature" is surely a gratuitous assumption, and even so, do not savages call things by names?

It is worthy of note, in support of the archæological evidence advanced, that according to the most reliable authorities, civilised man as we understand him is (so far) unknown prior to about 5000 B.C., after which he tends to fill the picture.

With regard to chromosomes and the "transmutation of species," it ought to be noted that protracted experiments with *Drosophila* indicate that chromosomic changes *do* take place, and are sudden and spontaneous, the survival of the resultant mutations being conditioned by the circumstances in which they arise—usually unfavourable under natural conditions.

In conclusion, might it be suggested that those who seek to expound the Scriptures should first address themselves to the all-important task of discovering exactly what those Scriptures themselves actually say, rather than overlaying them with a mass of subjective, and often speculative, scholarship.

WRITTEN COMMUNICATIONS.

Lt.-Col. L. M. DAVIES, M.A., F.G.S., F.R.S.E., F.R.A.I., wrote:—I hold that the first two chapters of Genesis cannot be taken apart from the third when studying nature as we find it to-day. The first two chapters describe the production of an ideal world which no human being but Adam and Eve ever saw—one in which all creatures were vegetarians (i, 29–30), death with suffering and strife did not exist, and God could call everything "very good." The third chapter introduces the Curse and all those aborted and offensive structures, typified by serpents in the animal world and thorns and thistles in the vegetable, which characterise the inter-necine strife of nature to-day.

As to present conditions, Scripture says that "the whole creation groaneth and travaileth in pain together" (Rom. viii, 22), and bids us look forward to days when "the wolf shall dwell with the lamb, and the lion shall eat straw like the ox" (Is. xv, 6-7). In other words, the Curse will be removed and life will return to conditions like those that existed before the Fall. So far as I can see, Scripture indicates that a stupendous reorganisation of nature took place at the Curse; as great a work as anything which God did during the Six Days, since animal and vegetable structures were modified to antagonise each other in countless ways not originally intended or finally approved.

If we refuse to believe this, we should equally refuse to believe the prophecies about the Millennium, and should also deny that millions of long dead Christians will really rise from their graves at the Second Advent; for the latter not only involves quite as great a work of God, but implies that the death of the body results from the Curse and held no place in Creation prior to the events described in the third chapter of Genesis.

I mistrust all attempts to treat the Six Days of Genesis i as geological epochs instead of as literal days. All such attempts arise from, and aim at supporting, the idea that the fossiliferous rocks were laid down *during the Six Days*; and I find fatal objections to this idea in the fact that those rocks are packed with evidences of death, disease, fear, pain, abortions and internecine strife, just as these same Scripturally-deprecated things characterise nature to-day. How could God have called such things "very good" during creation Days, if He regards them as abominable now?

As a geologist and as a Christian I see only one way of reconciling Scripture with the testimony of the rocks, and that is by taking the Six Days of Genesis i as *literal* days, during which a previously ruined world was restored and provided with an (unfortunately only temporarily) ideal population. If this view makes large demands upon our faith, it is at least free from contradictions, and leaves us our Bibles intact. We can believe that Scripture means what it says; we can logically deny that God approves of suffering and internecine strife in nature; and we can reasonably expect both the physical resurrection and the millennial conditions of which the Bible speaks.

It signifies nothing that the word "day" was sometimes used in a broad sense. We have to consider the sense intended in Genesis i; and that is settled from the very beginning by the fact that the first "Day" is specifically defined as being a period of *light* separated from darkness called "Night" (Gen. i, 5). Thus "day and night are contrasted," just as our author himself says (p. 35) is done when the word "day" is meant to be taken literally! Indeed, since all commentators—including our author—agree that *this first light was literal*, the "Day" which it constituted must also have been literal. Light did not simply appear *during* the First Day but WAS the First Day; and since the following Days are treated as resembling it, with similar evening and morning to each, it is clear that each was a period of literal light alternating with literal darkness. It will not help our author to deny that they were ordinary days and suppose that they were colossal epochs of light separated by equally colossal epochs of darkness; and I would remind him that the existing Sabbath is blessed because God rested upon IT, not upon something represented by it.

The author talks (p. 36) about days being "measured by the ticking of a clock." As it happens, clocks are adjusted to days, not days to clocks; and creation Days, like all others, are defined by alternating light and darkness. These alternations are the only criteria known to science, and their appearance—so significantly insisted upon in Genesis i—is not to be brushed aside.

The author's mental confusion on this point is obvious. He asks us to regard these as "not man-measured, but God-measured days" (p. 37); as if man, and not God, made days what they are! He says that they "should be interpreted" in the light of the statement that a thousand years are as one day to the Lord; and apparently does not realise that a hundred thousand times a thousand years would not suffice if these really were geological epochs. In one breath he tries to dispose of the references to evening and morning as indicating nothing but "orderly, progressive movement," and in the next breath he adopts Hugh Miller's suggestion that they indicate that Moses actually saw six visions "beginning with an evening, and ending with a morning" (p. 37). He sees nothing incongruous in the argument that because the last book of the Bible professedly describes visions, the first book must open with a vision described

as cold history. To such passes does unsound exegesis lead its advocates.

As to the second verse of Genesis, I have obtained ample admissions—some unwilling—from Hebrew scholars to the effect that its opening words are best rendered “and the earth BECAME *tohu va bohu*.” We also have Isaiah’s assurance (xlv, 18) that God did NOT create (*bara*) the earth *tohu*. Indeed the word *tohu* seems always to indicate something obnoxious—and usually accursed—in Scripture; so its appearance in Gen. i, 2 is incompatible with the idea of a newly created world. Even a critic like Skinner, after studying Jeremiah’s vision of a *tohu va bohu* earth (iv, 23–26), says that the “safest” exegesis would take Gen. i, 2 to indicate not a state of primeval chaos, but “a darkened and devastated earth from which life and order have fled” (*Crit. & Exeget. Comm. on Gen.*, p. 16–17). He also reminds us that the very idea of “chaos” comes from Pagan, not Jewish, sources.

The earth was not “formless” in the second verse of Genesis, as Dr. Hart-Davies asserts (p. 39). It is a striking fact that the story of the Six Days mentions no work whatever upon the solid earth, which is treated throughout as existing in an already finished condition and requiring only to have its surface cleared and populated.

I also deny that any true parallel can be drawn between the events of the Fifth and Sixth Days and the geological record. Our author seems to take the land animals of the Sixth Day to be mammals—I suppose he means placental mammals, for others go back far into the Mesozoic. But the Bible makes no limitation since it includes “everything that creepeth upon the earth”; and terrestrial creepers go back to the Palæozoic. Land reptiles were contemporary with the marine reptiles to which the author refers, just as land mammals are contemporary with marine mammals to-day. It is an unquestionable fact that land forms appear in the rocks long before any birds. Indeed, the very fact that Genesis talks of “every winged fowl” being created before anything whatever on land, shows that its account is no epitome of the geological record.

Much more could be said to similar effect, which space forbids my mentioning here. I will only remark that attempts (p. 39) to disparage the “catastrophe” theory (of a disaster between the first two verses of Genesis) as recently propounded to escape the geolo-

gical difficulty, are unfortunate, since the "period" theory (that the Days of Genesis each consisted of myriads of real days) was propounded at much the same time to escape the same difficulty. Indeed, the former is really much the senior theory of the two, since the existence at least of a measureless GAP between the first and second verses of Genesis was pointed out by early Church fathers many centuries before geology began to exist as a science. All that Chalmers did was to show that the geological epochs might go into that gap, as the significant opening words of Gen. i, 2 suggest, I think that I, as a geologist, am sufficiently "scientifically educated" to judge of the respective difficulties of the "catastrophe" and "period" theories; and I unhesitatingly regard the former as the easier one to defend ON ALL ACCOUNTS.

Lt.-Col. A. G. SHORTT, late R.A., wrote: In criticising this paper, I propose to confine myself to two points among many.

The mere quoting of authors which appeals to the lecturer is not proof. It gives a one-sided attitude to the question, for there are plenty of other authors who take a different view. The quotation from Quatrefages, on p. 52, and the comment which follows is a case in point.

It is not easy to grasp the meaning of the title, for these chapters can never be the *basis* of science. Science and religion work from opposite ends, and all that can be urged is that Genesis is or is not contrary to the laws of Nature.

But even so, it surely is necessary, before anything else, to find out what these chapters do mean, or in other words, what portion of them is reality and what portion symbolism, for it is the reality that matters in this connection.

Dr. Hart-Davies has not attempted to separate the two. He does suggest that the Tree of Life is symbolic, but the grounds given for this would equally apply to the formation of Eve.

He does not question the meaning of "the earth" as applying to the whole world. And yet, it was not so applied, even in Genesis, as in Gen. xix, 31 ("there is not a man in the earth"), and "the earth," which was covered by Noah's flood, was certainly local, *vide* Joshua xxiv, 2, 3, 14, 15 ("the other side of the flood").

No doubt it was believed that God made "everything," and "the earth" in i, 1 would imply the world as such. But they did not in the least know what was the extent of the world in those days.

May I add a reminder that the Persians, in the Zendavesta, made the Creation to be six unequal periods, totalling 370 days.

Mr. THOMAS FITZGERALD wrote: While there is much of real value in Dr. Hart-Davies' essay, the method adopted in his treatment of the subject is open to criticism. From the title of the paper it might be expected that his first consideration would be to carefully examine and expound the first two chapters of Genesis, and then explore and point out how those chapters may be considered as a basis of science. Instead of that, the order has been reversed, and the writer has started off with an attempt "to demonstrate the scientifically accurate basis" of Gen. i and ii, using the discoveries of science as a basis for a right understanding of those chapters.

The writer of the essay, *Mosaic Cosmogony*, in *Essays and Reviews*, wrote that he was urged to put pen to paper because he believed "that if the value of the Bible as a book of religious instruction is to be maintained, it must be not by striving to prove it scientifically exact, at the expense of every sound "principle of interpretation, and in defiance of common sense, but by frank recognition of the erroneous views of nature which it contains."*

This view has long been held, and is more widely held to-day than ever. It constitutes a challenge which must be met, and the only way to meet it is first to ascertain the true meaning of the words used by Moses in his narrative. Surely it may be claimed that Moses, as a historian, would write so as to be understood, and that he himself possessed an intelligent understanding of the meaning of the words he used.

We may learn even from our opponents on this point, for Sir Robert Anderson quotes the dictum of the late Professor Huxley, "that it is vain to discuss a supposed coincidence between Genesis and science unless we have first settled, on the one hand, what Genesis says, and on the other hand, what science says."† We are still a

* *Essays and Reviews*. Second Ed., p. 211.

† *The Bible and Modern Criticism*, p. 120.

long way from settling what science has to say, while it is now taken for granted by very many that what Genesis says is quite understood, and can no longer be accepted as a "strictly scientific" account of the origin of the universe.

I hold tenaciously to the view that "The duty of the biblical student, as such, is to give the meaning of the original narrative in its plainest terms, *quite irrespective of what scientific consequences may ensue*,"* and as to creating "scientific difficulties greater than those it is intended to solve," I must confess that I am not much disturbed about "scientific difficulties." As a biblical student, I am profoundly concerned about the Scriptural difficulties raised by the interpretation of the "days" of Gen. i and ii, as signifying vast, indeterminate periods of time.

The author, on page thirty-nine, says that he cannot accept the interpretation (? translation) of those who hold that the Hebrew words of Gen. i, 2 should be translated, "and the earth became," instead of "and the earth was." He states that "Few Hebraists, I am convinced, would be willing to translate the Hebrew in the manner suggested," and in support he quotes from *The Bible and Modern Research*.

That quotation is regrettable, because it perpetuates a charge which has again and again been refuted. To repeat it at this time of day either indicates ignorance of the literature on the subject or a biased mind which ignores what has been written by learned men in the past.

Not "when geology was a young science," but *centuries* before geology or biology were thought of, learned men translated Gen. i, 2, in the English words, "And the earth became without form and void." Not Dr. Chalmers in 1814, but the learned Dathe in 1781, gave the translation, "In the beginning God created the heaven and the earth. But afterwards the earth became waste and desolate," and he expressly distinguishes the condition of the earth in verse two, from that referred to in verse one. Dr. Pusey, Regius Professor of Hebrew, Oxford, says: "The belief that creation, at least, dated backward for countless ages, was current in the Church some 1,400 years before geology."†

* *V.I. Trans.*, vol. ix, p. 149.

† *Daniel the Prophet*. By Rev. E. B. Pusey, D.D., Pref., p. xvii.

The charge that such a translation was "a comparatively easy way of escape" from the difficulties geological researches had raised against its being accepted, should be abandoned for all time, for there is ample evidence that this translation was anticipated by some of the early Fathers, and therefore could not possibly have been suggested by geology.

Dr. Eadie stated long ago that "The length of time that may have elapsed between the events recorded in the first verse (of the first chapter of Genesis) and the condition of the globe, as described in the second verse, is absolutely indefinite. How long it was we know not; and ample space is therefore given to all the requisitions of geology. The second verse describes the condition of our globe when God began to fit it up for the abode of man. The first day's work does not begin till the third verse. . . . This is no new theory. It was held by Justin Martyr, Basil, Origen, Theodoret and Augustine—men who came to such a conclusion without any bias, and who certainly were not driven to it by any geological difficulties."

The names of several scholars of high repute can be cited in support of the translation which Dr. Hart-Davies finds it impossible to accept. The whole question has been very thoroughly argued in the works of John Harris, D.D., *The Pre-Adamite Earth*, and *Man Primeval*. *The Principles of Geology*, by the Rev. David King, LL.D. (Second Ed.—Revised and Enlarged). *The Bible and Modern Thought*, by the Rev. T. R. Birks, M.A. *Neology Not True*, by the Rev. Chas. Hebert, M.A. (Second Ed.). *Daniel the Prophet*, by the Rev. E. B. Pusey, D.D., Regius Professor of Hebrew, Oxford; and Jamieson, Fausset and Brown's Commentary (Genesis). There is also a valuable paper on the subject by the Rev. A. I. McCaul, M.A., Lecturer in Hebrew at King's College, London, published in the *V.I. Trans.*, vol. ix. On page 167 of that volume, the Rev. A. I. McCaul states his belief "that the more physical science advances, the more will the literal sense and accuracy of the Mosaic account be indicated."

AUTHOR'S REPLY.

Dr. HART-DAVIES said: It is physically impossible to read even half of the Prize-Essay, consisting of some 15,000 words, in the space allotted; and it is equally impossible, in the few minutes set apart for reply, to attempt to answer the various criticisms presented. I

must confine myself mostly to two of these. One has reference to the length of the creative days. I personally do not object to those who interpret these as consisting of twenty-four hours, as we reckon time ; but I am convinced that they have no manner of right to force that interpretation upon others as the only one permissible. All the real evidence in my judgment goes against that interpretation. The same remark applies to those who, out of their own imagination demand that we shall assume, what the Bible nowhere affirms, that there was a gigantic cataclysm between the first and the second verses of the first chapter. The oft-quoted buttress text in Isaiah xlv, 18, just provides, in my opinion, an illustration of wresting the Scriptures apart. The whole statement in that verse should be quoted in full to obtain its real significance.

I am persuaded, however, that these are very minor points in comparison with the grand revelation contained in the first two chapters of Genesis. Taken as a whole it presents a stupendous problem to the scoffer and sceptic. Having in mind the many centuries that have elapsed since it first appeared before the eyes of men, remembering also how precisely it has anticipated the exact findings of modern science, we have every right to affirm that it could only have been produced by the finger of God ; that such a composition bears upon its surface the marks of a divine inspiration ; that it could only have emanated when at some far distant period holy men of old were moved to write as prompted by the inspiration of the Holy Ghost.