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ORDINARY MEETING, FEBRUARY 7, 1876.

The Rev. PREBENDARY CURREY, D.D., IN THE CHAIR.

The Minutes of the last meeting were read and confirmed, and the following elections were announced :—

MEMBERS :—

Rev. R. W. Forrest, M.A., St. Jude's Vicarage, Kensington.

Rev. J. G. Hawes, M.A., R.D., late Fellow of St. Peter's Coll. Camb., Minehead.

ASSOCIATES :—

J. Bush, Esq., Chatham.

D. A. T. Christie, Esq., London.

C. E. B. Young, Esq., London.

Rev. H. Ryder Ware, M.A., C.C. Coll. Camb., London.

Also, the presentation of the following Works to the Library :—

“Proceedings of the Royal Society.” Part 165. *From the Society.*

“Proceedings of the Royal Institution.” Part 63. *From the Institute.*

“Light as a Motive Power.” Lieut. Armit, R.N. *From the Author.*

“Everlasting Punishment.” Rev. F. N. Oxenham, M.A. *Ditto.*

The following Paper was then read by the Author :—

HEATHEN COSMOGONIES COMPARED WITH THE HEBREW. By the Rev. BOURCHIER WREY SAVILE, Shillingford Rectory, Exeter.

1. **I**N attempting to compare the various theories entertained by ancient writers respecting the origin of men and things, with the Hebrew cosmogony, as set forth in Scripture, it may be best to allow the several authorities, from which I shall have occasion to quote, to state, as far as possible in their own words, the belief entertained by their fellow-countrymen on this important subject. But it will be impossible to consider some of the very curious and extravagant theories thus stated without observing, as the late Sir Charles Lyell truly remarked, that they do “not seem to differ essentially in principle from some cosmological notions of men of great genius and science in modern Europe.”*

2. Referring to the “cosmological notions” entertained by the ancient EGYPTIANS, as set forth in that wonderful book, *The Ritual of the Dead*, portions of which are undoubtedly as old as the time of Abraham, and therefore some centuries older than the Books of Moses, we find that they believed in the

* Lyell's *Principles of Geology*, vol. i. p. 11.

supposed intervention of a masculo-feminine principle, to which was assigned the development of the embryo world in the way of incubation. For the doctrine was that when the first chaotic mass had been produced in the form of an *egg*, by a self-dependent and eternal Being, it required the mysterious functions of this masculo-feminine demiurgus to reduce the component elements into organized forms. Thus, *e.g.*, we find such passages as these in the *Ritual*:—"I am the Great God, creating Himself. It is water, or Nu, who is the father of the Gods. Let him explain it. The Sun is the creator of his body, the engendered of the Gods who are the successors of the Sun" (ch. xvii.). Again it is written, "I am the Egg of the Great Cackler Seb. I have watched this great egg which Seb prepared for the earth. I grow, it grows in turn; I live, it lives; I breathe air, it breathes air, in Hades" (ch. liv.).*

3. The Hermetic books, according to Jamblicus, teach as follows:—"Before all things there is one God, who is the Father of Himself, self-begotten, and truly good. He is the fountain of all things, and the root of all primary intelligible existing forms. Out of this one the self-ruling God caused Himself to shine forth. He is the monad from the one; before essence, yet the first principle of essence, for from Him is being and essence; wherefore He is celebrated as the Chief of the Intelligibles. He is the first Intellect, and the first Intelligible. Besides these, other rulers are supposed to exist, such as the demiurgic Intellect, which properly presides over truth and wisdom. There is, also, another certain principle, presiding over all the elements in a state of generation, and over the powers inherent in them, four of which are male and four female; and this principle they attribute to the Sun. Hence the doctrine of the Egyptians inculcates the origin of all things

* The egg of the Cackler, *i.e.* the goose, as the emblem of Seb, is mentioned on an old coffin in the British Museum, of an unknown date. It occurs also on a statue in the Berlin Museum of the age of Thothmes III., the contemporary of Moses, which would fix its date to the sixteenth century B.C. Dr. Birch considers that the earliest appearance of Rituals is in the coffin of Queen Mentuhetp, of that dynasty, and the approximate contemporary of Abraham. The 64th chapter is supposed to be the oldest of all, as it belongs to the epoch of King Menkeres, of the 4th dynasty, *i.e.* the 22nd century B.C. There is much that is very interesting in these Rituals, which contain the esoteric explanation of the faith of the Egyptians, the Crown of Justification, and the doctrine of the Resurrection, though of course, to our ideas, held in a modified form; and it is a matter of surprise that this remarkable book has not been more regarded by Christians at the present day, as proving the measure of light and knowledge to which the ancient Egyptians had attained in their search after truth.

from one, with different gradations to the many, which are again held to be under the supreme government of the One."*

4. Diodorus Siculus, a Greek historian of the first century B.C., describes the current Egyptian cosmogony of his own day as follows:—"The Egyptians suppose that at the original constitution of all things, heaven and earth possessed one uniform appearance, their respective natures being mixed up together. But after this, the material substances separating from each other, the earth took the entire constitution which it now has, and the air acquired the art of perpetual motion. In consequence of the heat acting upon this earth, it gradually received consolidation; and, subsequently, fermentation taking place on the surface, in consequence of the heat, some of the moist matter swelled up into bubbles in many places; and these moist spots became, by means of the heat, impregnated with animal life. At last these embryos, having acquired their full growth, and the membranes which enveloped them having burst, all the various forms were produced. Those which had partaken of the greatest heat soared away to the higher regions and became *birds*; those which retained the earthly constitutions were reckoned *the occupants of earth*; those which had gotten the greater abundance of moist nature fell into the sea and became *FISH*." †

5. The monuments of Egypt afford some indication of the cosmological notions entertained by the Egyptians towards the close of their history. Thus, on a monument of the time of Apries, of the 26th dynasty, the Pharaoh-hopra of Jeremiah (xliv. 30), who reigned B.C. 570, Khnum is said to be the begetter of gods, and the creator of men. In a later monument he is described as the great Potter, father of fathers, of gods and goddesses, the self-existent maker of heaven and earth, the firmament, the waters, and the hills. ‡ And in the mystic chamber of the Temple of Philæ, which belongs to the Ptolemaic epoch, there is to be seen a representation of the god Khnum turning a potter's wheel, moulding the mortal

* Jamblicus, sect. viii. c. 2, § 3.

† Diodorus Siculus, lib. i. c. 7.—Diodorus is said to have taken thirty years in epitomizing all the known libraries of Asia and Europe in order to produce the forty entire books of his own history. But he appears to have made a curious jumble, according to Justin Martyr, respecting the Egyptian lawgivers, mistaking Menes for Moses, and making the following anachronism in the order of the Egyptian lawgivers. Sesonchosis, a king of the 12th dynasty, who reigned circa 2000 B.C., is succeeded by Bocchoris, of the 24th dynasty, who in his turn is succeeded by Amasis, of the 18th dynasty, and the same who is mentioned in Scripture as the new "king over Egypt which knew not Joseph." See Justin's *Hortatory Address to the Greeks*, c. ix.

‡ Rosellini, *M. R.*, clxix.

part of Osiris, the type of mankind, out of a lump of clay, with the following inscription: "Khnum, the Creator, forming on the potter's wheel the divine members of Osiris, now is enthroned in the great hall of life." This inscription reminds us very much of what Isaiah says on the same subject: "Now, O Jehovah, thou art our father; we are the clay, and thou our potter; and we are all the work of thy hand" (lxiv. 8). Inasmuch as the Egyptians were in possession of the Septuagint at the time when this inscription was made, we might suppose the idea had been taken from the Hebrew prophet, only it appears that Khnum was known to the Egyptians in this character some centuries before the Ptolemaic period.

6. Gliddon gives another inscription to the same effect, but unfortunately without mentioning whence it is taken, or the time to which it belongs. It reads as follows:—"May thy soul attain to Khnum, the creator of all mankind." And Gliddon considers that "this alone is a proof of the primitive Egyptian creed of one God the Creator (whose divine attributes were classed in triads), of man's possession of a soul, and of his immortality; of a resurrection, and of the hope of such."*

7. Turning now to the PHŒNICIAN cosmogony as next in chronological order, for Sanconiatho its exponent is supposed to have lived about four centuries after Moses, we find him explaining it in the following way. He says, that the beginning of all things was a dark and a condensed wind, and a turbid chaos as black as Erebus. In course of time this wind became enamoured of chaos, and an intimate union took place which was called Pothos. From this union was generated *Môt*, which some call "Mud," but others, the putrefaction of a watery mixture. And from this sprang all the seed of the creation and the generation of the Universe. And there were certain animals without cessation, from which intelligent animals were produced, and these were called *Zophasemin*, *i. e.* "the overseers of the heavens"; they were formed into the shape of an *egg*; and from *Môt* came forth the sun and moon, the less and the greater stars. And when the air began to send forth light, by its fiery influence on the sea and earth, winds were produced and clouds, and very great torrents of the heavenly waters. And when they were thus separated, and carried out of their proper places, by the heat of the sun, they all again met in the air, and were dashed against each other, thunder and lightnings being the result. At the sound of the thunder the aforesaid *Zophasemin* (who would be called "astronomers" nowadays) were aroused and startled by the noise, and appeared on earth and in the sea, *male* and *female*. These things were

* Gliddon's *Ancient Egypt*, pp. 28, 29.

found written in the Cosmogony of Taautus, and were drawn from his observations and natural acuteness, or, what would be termed in our age, perhaps, the depths of his moral consciousness, by which he has penetrated all science and enlightened the world.*

8. Although some have pronounced Sanconiatho to be a myth who only existed in the imagination of Philo Byblius, a writer of the first century, there are reasonable grounds for believing him to be a real person, who lived about a century after the Trojan War.† For Porphyry, who was no friend to Christianity, and who flourished two centuries after Philo, appears to describe Sanconiatho as having related Jewish history with truthfulness, saying that he received his accounts from Jerubbaal, the same as Gideon (Judges vii. 1), and that he dedicated his work to Abibulus, king of Berytus. Canon Titcomb, in an admirable paper on the *Ethnic Testimonies to the Pentateuch*, read before this Institute, May 1, 1871, considers in the fragments of Sanconiatho "we have an interesting testimony to the Mosaic cosmogony." I am hardly prepared to go so far as this; but I think we may accept his teaching of the cosmological notions of the Phœnicians in very ancient times.‡

9. Although we should be inclined to take the Chaldæan cosmogony as interpreted by Zoroaster next in order, yet, as Hyde, in his *Historia Religionis Veterum Persarum*, considers the *Boun-dehesch*, or "cosmogony of the PERSIANS," of a date much earlier than the era of Zoroaster—*i.e.* the sixth century B.C., we will let it have the precedence it claims, and learn what the ancient Persians believed on this subject, which is stated as follows:—

10. The Deity Ormisda created all things at six different intervals. First, he formed the heavens; secondly, the waters;

* Eusebius, *Præp. Evan.*, lib. i. c. x. † *Id. ib.*

‡ *Journal of the Transactions of the Victoria Institute*, VI. p. 248. Canon Titcomb writes that Sanconiatho mentions "the Supreme God of the Phœnicians was *Elion*, which is the very name Moses gives in Genesis (xiv. 18) as that by which Melchisedec served Jehovah. This testimony is very remarkable." I do not understand Sanconiatho in this way. It is true that he says from Chaos sprang *Môt*, which some call *ἰλδς* or "Mud"; and also from the marriage of "Heaven" with his sister "Earth" sprang four sons, the first-mentioned being *ἰλδς*, "who is called Cronus"; but I do not see that this *Ilus* or *Cronus*, who was deified after death, was necessarily the Supreme God of the Phœnicians, or the same as the *El Elion* of Genesis xiv. 18, 19, which Moses terms "the most High God"; although it is true that Sanconiatho says "the auxiliaries of *Ilus*, who is *Cronus*, were called *Eloëim*." If this be the same person who is described by Berosus under the same name of "Cronus," it would point rather to the deified Noah, than to the Supreme Jehovah.

at the third period the earth; next in order were produced the trees and vegetables; in the fifth place were formed the birds and fishes and wild inhabitants of the woods; and in the last place he created man. This being was called "*the Man and Man-Bull*," and was not produced by the union of male and female. The man part was called *Kaiomorts*, and the man-bull part *Aboudad*. *Kaiomorts* was pure and thinking; *Aboudad* mortal and material. *Aboudad* was the author of all generations. After the creation, for some time there was a season of great happiness. The man resided in a peculiar place of high elevation, where the Creator placed him. At length, *Ahriman*, an evil spirit, corrupted the world. He rose from the regions of utter darkness, and ascended to the realms of pure light—i.e. the sun, whence he leapt upon the earth in the form of a serpent, and introduced a set of wicked beings called *Karfesters*. He bit *Aboudad*, who was immediately affected by his poison, fell sick, and died at the age of thirty years. Before *Aboudad* appeared, *Ormisda* had prepared a salutary fountain called *Binak*, which communicated its virtues to all who drank of it. Upon *Kaiomorts* appearing, *Ormisda* created a water called *Khai*, and brought it to him; from the effects of this water *Kaiomorts* had the body of a young man of fifteen years old, shining with light. *Ahriman*, in addition to that which he contrived against man, formed the design of destroying the whole universe. The heavenly angels fought with *Ahriman* and his angels for ninety days and ninety nights. They overcame them, and cast them into hell. From the midst of hell *Ahriman* went upon earth, and put everything in the world into confusion. And this enemy of all good insinuates himself everywhere, and is found everywhere, seeking what mischief he can do above or below.

11. The above analysis of the cosmological notions entertained by the ancient Persians is taken from a work entitled *Hebrew Characters Derived from Hieroglyphics*, by Dr. John Lamb, Master of Corpus Christi College, Cambridge; and it contains sufficient internal evidence that the founders of this system must have had either some knowledge of the Mosaic writings, or else some national traditions current amongst their race from the time of the dispersion to the same effect.

12. A few extracts from the Chaldæan Oracles of Zoroaster, as given in Cory's *Ancient Fragments*, will enable us to judge of the ideas which prevailed in the region of the Euphrates about the time of the return of the Jews from the Babylonish captivity, concerning God, mind, matter, and monad, &c.

13. God is He that has the head of a hawk. He is the first, indestructible, eternal, unbegotten, indivisible, dissimilar; the dispenser of all good; incorruptible; the best of the good, the

wisest of the wise; the Father of equity and justice, self-taught, physical, and perfect and wise, and the only inventor of the sacred philosophy. The Theurgists assert that He is a circulating and eternal God, infinite through his power, and of a spiral form.

14. The Chaldæans call the God *Iao* in the Phœnician tongue, instead of the intelligible light; and He is often called *Sabaoth*, signifying that he is above the seven poles, that is, the Demiurgus. Containing all things in the one summit of his own subsistence, He himself subsists wholly beyond.

15. The mind of the Eternal Father said that all things should be cut into three, governing all things by mind. All things are governed and subsist in these three. For in the whole world shineth a *Triad*, over which a *Monad* rules.

16. Of the *soul* it is thus said:—Having mingled the vital spark from two according substances, mind and the Divine Spirit, to these were added as a third, Holy Love, the venerable charioteer uniting all things. For the Father of gods and men placed the mind in soul, but in a body He placed you. The soul does in a manner clasp God to herself; for, having nothing mortal, she is wholly inebriated from God, and glories in the harmony under which the mortal body exists. The soul perpetually runs and passes through all things in a certain space of time, which being performed, it is presently compelled to run back again through all things, unfolding the same web of generation in the world. Let the immortal depth of your soul lead you; but earnestly extend your eyes upward.

17. Of *matter*, Zoroaster is thus supposed to have taught. We learn that matter pervades the whole world, as the gods also assert. The Maker, self-operating, framed the world, and there was another mass of fire: all these things He produced self-operating. He has made the whole world of fire, and water, and earth, and all-nourishing ether. For the Father congregated the seven firmaments of the world, circumscribing the heaven with a convex figure.

18. The CHALDÆAN Cosmogony, as explained by Berosus, a priest of Babylon, and the contemporary of Alexander the Great, appears to be of a very different order from that taught by Zoroaster, and received by the Chaldæans* in the earlier

* Justin Martyr relates a curious story respecting the Chaldæans and Hebrews in his *Hortatory Address to the Greeks*. He says: "Since it has been sufficiently proved that the opinions of your philosophers are full of all ignorance and deceit, I think it right to mention what I once heard concerning your oracles. When one inquired at the shrine, What religious men had ever lived, you say that the Oracle answered thus: "Only the *Chaldæans* have obtained wisdom, and the *Hebrews*, who worship God Himself, the self-begotten King" (c. xi.).

times of their nation. The account which Berosus gives is as follows:—Formerly there existed nothing but darkness and an abyss of waters, wherein resided most hideous beings, the produce of a twofold principle. Then appeared men, some of whom had two wings; others four, with two faces. They had one body, but two heads; one that of a man, the other that of a woman.* Human beings existed, some with legs and horns of goats, others with horses' hind-quarters, &c. There were creatures in which were combined the limbs of every species of animals, of all which were preserved delineations in the temple of Belus at Babylon. The person who presided over them was a woman, named *Omoroca*, which in the Chaldæan tongue signifies *Thalath*, but in Greek *Thalassa*—i.e. “the sea,” and which might equally be interpreted “the moon.” All things being thus, Belus, who is Jupiter, came and cut the woman in sunder, and of one half of her he formed *the Earth*, and of the other half *the Heavens*. All this, Berosus teaches, was an allegorical description of nature. For the whole universe consisting of moisture, and animals being continually generated therein, the deity above-mentioned took off his own head; upon which the other gods mixed the blood, as it gushed out, with the earth; and *from thence were formed men*. On this account it is that they are rational, and partake of divine knowledge. Thus Belus divided the darkness, and separated the heavens from the earth, and reduced the universe to order. But the animals, not being able to bear the prevalence of light, died. Belus, therefore, seeing a vast space unoccupied, though by nature fruitful, commanded one of the gods to take off his head, and to mix the blood with the earth, and from thence to form the existing race of animals and men.†

19. Continuing our researches in Asia previous to investigating the Grecian mind on this subject, we find the cosmological notions entertained by the HINDOOS to be represented in their Shasters on this wise:—“All the germs of the world which subsequently came into existence were condensed in the shape of an egg, of which *Brahm* took possession in the form of *Brahma*. One thousand jugs, which equal three hundred million years, elapsed before the egg was hatched.

* In the Royal Museum at Naples are sculptures of Grecian art, representing men as described by Berosus, showing how the theory of the Chaldeans was accepted by the learned Greeks. There are certain figures represented in the sculptures, each with two heads; one evidently that of a male, the other of a female.—*Roccolta de' Monum. del R. Mus. Borbonico*. Napoli, 1842.

† Eusebius, *Chronicon*. v. 8.

During that period it floated like a bubble upon the mighty deep. At length it broke, and Brahma sprung to light, having a thousand heads, with an equal number of eyes and arms, to enable him to undertake *the work of creation*. Similarly with this incarnation, another monster appeared from the same egg, whose hairs were forest trees, his head the clouds, his beard the lightning, his breath the atmosphere, his voice the thunder, his eyes the sun and moon, his nails the rocks, and his bones the mountains of *the earth*. The egg being thus hatched, *Brahm*, as Creator, retired from the scene, and relapsed into his former state of somnolent blessedness. *The earth* is represented as a flat plain of circular form, measuring four hundred million miles in circumference, and resting upon an enormous snake with one hundred heads, which is itself supported by a gigantic tortoise. *Brahma* is said to die in course of time, and on his death all the worlds will suffer deluge; all the Audons will be broken up; and the Paradise of Vishnu will alone remain. At that time Vishnu, taking a leaf of the tree *Allemaron*, will place himself under the leaf in the figure of a very little child, and thus float on the sea of milk, sucking the toe of his right foot. He will remain in this posture until Brahma comes forth from his navel anew in a tamarind flower. It is thus that the ages and worlds succeed each other, and are perpetually renewed.*

20. A far superior idea of true cosmogony is found in the *Institutes of Menù*, to which Sir William Jones ascribes an antiquity of at least 880 B.C., and which seems to show that the Hindoos must have borrowed some of their notions from the Mosaic writings. Thus, in the first chapter of that work God is represented as first creating the *waters*, which are called *Nara*, because they were produced by *Nara*, or "the Spirit of God"; and because they were His first *ayana*, or place of motion, He is called *Narayena*,† or, "moving on the waters." Afterwards, the alternate destruction and renovation of the world is

* See Moor's *Hindoo Pantheon*, p. 100, &c.

† The following hymn has come into the author's possession, he cannot recollect how, when, or where; but he believes it to be a translation from the Sanskrit in honour of *Narayena*, the Holy Spirit according to Hindoo theology. He has only space for a portion of the hymn, which begins thus:—

Spirit of Spirits, who through every part
Of space expanded and of endless time,
Beyond the stretch of labouring thought sublime,
Bad'st uproar into beauteous order start,
Before Heaven was, Thou art.

thus described :—The Being whose powers are incomprehensible having created me (Menù) and this universe, again became absorbed in the Supreme Spirit, exchanging the time of work for the hour of rest. When that power awakes, then has this world its full expansion ; but when He slumbers with a tranquil spirit, then the whole system fades away. Thus that immutable power, by waking and reposing alternately, revivifies and destroys, in eternal succession, this whole assemblage of locomotive and immovable creatures.*

21. Passing from India to CHINA, some of the cosmological legends of the latter resemble, in some respects, those current amongst the Hindoos. Thus it is said that the first man was called *Puonen*, and that he was born of Chaos out of an egg. From the *shell* of this egg, in the deep gloom of night, were formed the heavens, and from the *white* of it was made the atmosphere, and from the *yolk* the earth. In point of order, the heavens were first created ; next the foundations of the earth were laid ; then the atmosphere was diffused around the habitable globe ; and, last of all, man was called into existence. Further light is thrown upon the cosmogony of the Chinese in their book *Y-king*, supposed to have been written B.C. 500. The book teaches that what they call “ the great Term,” is the great *Unity* and the great *Y* ; that *Y* has neither body nor figure ; and that all which have body and figure were made by that which has neither body nor figure. It asserts also that the great Term, or *Unity*, comprehends “ *Three*,” and describes this comprehension to be of such a nature that the one is three, and that the three are one. *Iao* is Life ; the first has produced the second ; the two have produced the third ; and the three have made all things. He, whom the Spirit perceiveth, and whom the egg cannot see, is called *Y*, whose character is explained by *Hin-chin* as follows :—“ At the first beginning Reason subsisted in the *Unity* ; that is it which made and divided the heaven and the earth, which changed and perfected all things.”†

My Soul absorbed one only Being knows,
 Of all perceptions one abundant source,
 Whence every object every moment flows ;
 Suns here derive their force ;
 Hence planets learn their course ;
 But Suns and fading worlds I view no more—
 God only I perceive, God only I adore !

* *The Institutes of Hindoo Law, or the Ordinances of Menù*, from the Sanskrit, c. i.

† *Mémoires chinois*, apud Bryant, in *Phil. Jud.*, pp. 285—287.

22. Returning now to Europe, let us consider what was the teaching of the two great nations of antiquity—the Greeks and Latins—on the subject of Cosmogony; or rather, as the former were the sole founders of the philosophical speculations on this subject, it will be sufficient if we direct our attention almost exclusively to the cosmological notions put forward by the Greeks, though these are so varied that it is difficult to compress within a reasonable space the various extraordinary and, I must add, extravagant theories propounded by these eminent philosophers of antiquity. Two Christian writers, both belonging to the second century, have alike called attention to the remarkable differences existing amongst them; and I think it may be well to give a brief sketch of what they have adduced as an argument against receiving the theories propounded by men who, though doubtless what would nowadays be called “very learned,” can scarcely be said to know their own mind on this important point.

23. Justin Martyr, in his *Hortatory Address to the Greeks*, says that Thales of Miletus, who took the lead in the study of natural philosophy, declared that *water* was the first principle of all things; Anaximander, *the Infinite*; Anaximenes, *the air*; Heraclitus and Hippasus, *fire*; Anaxagoras, *the homogeneous parts of nature*; Archelaus, an Athenian, that *the infinite air*, with its density and rarity, is the first principle of all things.* “All these,” says Justin, “forming a succession from Thales, followed the philosophy called by themselves *physical*.”

24. Then, in regular succession from another starting-point,

* Although Buddhism has been described by an acknowledged authority as “Monastic asceticism in morals, and philosophical scepticism in religion,” there is no doubt that the Buddhists recognized a supreme deity in *Vajra Satwa*, whom they termed “THE SELF-EXISTENT.” There is a curious account amongst the Buddhist traditions concerning Cosmogony, not unlike that of the Grecian philosophers. Thus the Swābhāvika doctrine is expressed as follows:—“All things come from Swabhāva in this order with their *vija mantras*: From the *vija* of the letter Y, *air*; from that of the letter R, *fire*; from that of the letter V or B, *water*; from that of the letter L, *earth*; and from that of the letter S, *Mount Sumēru*. On the top of Sumēru is a lotus of precious stones, and above the lotus a moon-crescent, upon which sits, supremely exalted, *Vajra Satwa*. And as all things, together with *Vajra Satwa*, proceed from Swabhāva, he is therefore called the SELF-EXISTENT.” (See Hodgson’s *Quotations in proof of his sketch of Buddhism*, p. 296.) Possibly some modern advocates of Buddhism may attempt to explain that all these things are poetic vagaries, as Empedocles endeavoured to do with reference to the gods of the Greeks, asserting that “Zeus is *fire*, Hera the *earth*, Aidoneus *air*, Nestis *water*; and that these are only elements—none of them are to be considered gods; for their constitution and origin are separated into parts from matter by God.” (See Athenagoras’s *Plea for the Christians*, c. xxii.)

Pythagoras calls *numbers*, with their proportions and harmonies, the first principles; Epicurus, bodies perceptible by reason, admitting no vacuity, unbegotten, indestructible, which can neither be broken, nor admit of any formation of their parts, nor alteration, and are therefore perceptible by reason. All this, divested of scientific entanglements, appears to mean the *atomic philosophy*, which is coming into vogue again with the learned of the present day. Empedocles maintained that there were four elements—fire, air, water, and earth, and two elementary powers—love and hate, of which the former is a power of union, the latter of separation. Justin makes the following sensible remark:—"See the confusion of those who are considered to have been wise men, and the teachers of religion; all of them employing persuasive arguments for the establishment of their own errors, and attempting to prove their own peculiar dogma the most valuable. How can the Greeks fancy they can learn true religion from these philosophers, who are neither able so to convince themselves as to prevent sectarian wrangling with one another, and not to appear definitely opposed to one another's opinions."

25. On the differences between Plato and Aristotle, Justin observes that the former says, "with the air of one that hath descended from above, and has accurately ascertained all that is in Heaven, that *the Most High God exists in a fiery substance*," which opinion the latter clearly and manifestly overthrows, declaring that "God does not exist in a fiery substance; but inventing, as a fifth substance, some kind of ethereal and unchangeable body, says that God exists in that."

26. Again, while Plato says there are three first principles of all things—*God, Matter, and Form*, Aristotle omits all mention of the last, and says there are only two. So, while Plato says that the Highest God and the ideas exist in the first place of the highest heavens, Aristotle declares that, next to the Supreme Deity, there are no ideas, but only certain gods, who can be perceived by the mind. Likewise, respecting the soul, while Plato says it consists of three parts, including the faculties of reason, affection, and appetite, Aristotle declares the soul is not so comprehensive, but only includes *reason*. Plato loudly maintains that the soul is immortal and always in motion; Aristotle, on the other hand, considers it mortal and immovable, since it must itself precede all motion.*

27. Hermias, a Christian philosopher of the second century,

* Justin's *Address to the Greeks*, c. v.—vi.

interprets the doctrines held by the Greeks respecting the soul in a very similar way. For some of them taught that the soul is *fire*, like Democritus; *air*, like the Stoics: some say it is *the mind*; others, *motion*; some, an *exhalation*; others, an *influence flowing from the stars*: some say *number in motion*, as Pythagoras; others, *generative water*, as Hippo: some say, *an element*; others, *breath*: some say, *harmony*, as Dinarchus; and others, *blood*, as Critias. Thus the ancients say contrary things, as Hermias truly observes, adding, "How many sophists are there who carry on strife rather than seek the truth."

28. Very amusing is the way in which he further brings out the contradictory teaching of the Gentile philosophers, which appears to resemble in more ways than one the singular dogmas propounded by many amongst ourselves in the present day. Thus, while one calls *pleasure the good* of the soul; another terms the same *its evil*; while a third steps in and declares it to be a *middle state* between good and evil. Hence Hermias says of the variety of opinions on this subject:—"I confess I am harassed by the ebbing and flowing of the subject. At one time I am *immortal*, and rejoice; at another time I become *mortal*, and weep. Anew, I am dissolved into *atoms*. I become *water*, and then *air*, and then *fire*; and after a little, neither air, nor fire. At one time I am a *beast*, at another a *fish*. Thus, I have dolphins for my brothers; but, when I look on myself, I am frightened at my body, and I know not how I shall call it, man or dog, or wolf, or bull, or bird, or snake, or serpent, or chimæra; for I am changed by the philosophers into all the beasts of the land, of the sea, having wings, of many forms, wild or tame, dumb or vocal, brute or reasoning; I swim, I fly, I rise aloft, I crawl, I run, I sit. But here comes Empedocles, and he makes me *the stump of a tree*."*

29. Hermias, after going over much the same ground which we have seen in Justin's account of the Grecian philosophy, playfully describes the Pythagorean doctrines in the following lively way:—"Lo, from the old school Pythagoras and his disciples, grave and silent men, mention amongst other doctrines this great and ineffable one. HE HATH SAID, the principle of all things is unity, but from its forms and numbers are produced the elements, and the number and form and measure of each of these is thus somehow declared. *Fire* is completed out of twenty-four right-angled triangles, being contained by four equilateral ones. Each equilateral one is composed of six triangles; whence also they liken it to a pyramid. But *air* is

* Hermias's *Derision of Gentile Philosophers*, §§. 1, 2.

completed by forty-eight triangles, being contained by eight equilateral ones. But it is likened to an octahedron, which is contained by eight equilateral triangles, each of which is divided into six right-angled ones, so that they are forty-eight in all. But *water* being contained by one hundred and twenty, is likened also to a figure of twenty sides, which consists of twenty-six equal and equilateral triangles. The *air* is composed of twelve equilateral pentagons, and is similar to a figure having twelve sides. Earth consists of forty-eight triangles, and is like a cube; for the cube is contained by six squares, each of which extends to four triangles; so that all together are twenty-four. Thus Pythagoras measures the world. But Epicurus says to me, 'You have only measured one world; there are an endless number of worlds.' Well might Hermias be frightened at the prospect before him. So he hastens his brief treatise to a conclusion with the following sensible reflection:—"All things appear to be mixed up with the darkness of error, unprofitable fancies, and most lamentable ignorance; utterly useless, unless, indeed, I intend to number the very *atoms* also out of which such great worlds are made. Thus, I have analyzed some of the doctrines of these Gentile philosophers, and have pointed out that the differences amongst them are unlimited; for their end is useless, not being confirmed by one clear fact, nor supported by one sound argument."*

30. Justin has a singular passage on the subject of the Greeks having learnt some things from Scripture, which I cannot forbear quoting. "I think," he says, "when you read even carelessly the history of Diodorus, you cannot fail to see that Orpheus,† Homer, Solon, Pythagoras, and Plato, when they had been in Egypt, and had taken advantage of the history of Moses, afterwards published doctrines concerning the gods quite contrary to those which they had formerly promulgated in error."‡

31. Let us see how this is borne out by the "Orphic Frag-

* Hermias's *Derision*, &c., §§ 8, 9, 10.

† It is curious to see how Homer appears to refer to the Orphic cosmogony, which, according to Orpheus, is thus explained. *Water* was the beginning of all things; from *water mud* was formed, and from both was produced *an animal*, a dragon with the head of a lion growing on it; and between the two heads there was the face of a god named Heracles and Kronos. This Heracles generated an egg of enormous size, which burst in two on becoming full, the upper half becoming *Heaven*, and the lower part *Earth*. The goddess Earth had a body, and by marrying Heaven gave birth to children both male and female. (See Athenagoras's *Plea for the Christians*, ch. xviii.)

‡ Justin's *Address*, c. xiv.

ments" * which have been handed down to us. Aristotle gives the following as the conception of Orpheus respecting the Supreme Being:—

Jove is the First. Jove the Thunderer is the last.

Jove is the head. Jove is the middle. By him were all things made.

Jove is male. Immortal Jove is female.

Jove is the foundation of the earth, and of the starry heavens.

Jove is the king. He is the author of universal life.

All things are united in the vast body of Jove.†

32. Proclus quotes another fragment, which seems to contain a mixture of the mundane egg theory and a conception of Deity somewhat resembling the four-faced figure described by the Prophet Ezekiel, as he writes:—"Orpheus has the following theological speculation in allusion to Phanes. The first God bears within himself the heads of these animals, many and single—an ox, a serpent, and a lion; and these sprang from the primeval egg, in which the animal is seminally contained."

* It is impossible to assign any date to the extant writings ascribed to Orpheus, such as the *Theogony*, the series of *Hymns* attributed to him, the treatise termed *Lithira*, and the epic poem *Argonautica*. By some he is supposed to have lived before the Trojan war; and Clement, Bishop of Alexandria, in the second century, asserts that many fragments of his works are to be found interwoven with the Homeric poems. Some fragments of the hymns ascribed to him are thought to indicate an acquaintance with the doctrine of the Trinity under the names of Phanes, Uranus, and Cronus; but this is rather doubtful, as they are found for the most part in writers of a very late period, and there is reason to question their genuineness.

† It is an undoubted fact that the great dramatists of the Greeks, who might be supposed to indulge in poetical license more than the philosophers, have expressed themselves respecting the Godhead far more in accordance with Revelation than the other learned writers of their nation. Take for example the nature of the Creator as so finely expressed by Sophocles in the following lines:—

There is one God, in truth there is but One,
 Who made the heavens and the broad earth beneath,
 The glancing waves of ocean, and the winds;
 But many of us mortals err in heart,
 And set up for a solace in our woes,
 Images of the gods in stone and brass,
 Or figures carved in gold or ivory;
 And, furnishing for these, our handiworks,
 Both sacrifice and rite magnificent,
We think that thus we do a pious work.

Sophoc. Fragm.

Even in the present day, these words of the heathen poet are not without their application, in the case of some who appear to underrate the claims of Christian philosophy.

33. Concerning the formation of man, both John Malala and Suidas relate the following:—"Orpheus has asserted that 'man was formed by God out of the earth, and endued with a reasonable soul,' in the same way as Moses has revealed."

34. Aristophanes, in his comedy of *The Birds*, thus records the Cosmogony of Orpheus, and, though undoubtedly satirical, it must afford some satisfaction to certain speculators in the present day respecting the origin of men and things.

First was Chaos and Night, and black Erebus and vast Tartarus ;
 And there was neither Earth, nor Air, nor Heaven : but in the boundless
 bosom of Erebus
 Night, with her black wings, first produced an aërial egg,
 From which at the completed time sprang forth all-delightful Love,
 Glittering with golden wings upon his back, like the swift whirlwinds ;
 But embracing the dark-winged Chaos in the vast Tartarus,
 He begat our race THE BIRDS, and first brought us to light.
 The race of the Immortals was not, till Love mingled all things together,
 But when the elements were mixed one with another, Heaven was produced
 and Ocean,
 And Earth, and the imperishable race of all the blessed gods !

35. The cosmogony of the Greeks, as found in the Pythagorean* Fragments, is thus explained by Timæus the Locrian:—"The causes of all things are two—*Intellect* and *Necessity*. Of these the first is of the nature of good, and is called God,—the principle of such things as are most excellent. Before Heaven was made, there existed in reality *Idea* and *Matter*, and *God the Creator of the better nature* ; and since order is more worthy than disorder, God in His goodness, seeing that *Matter* was continually changing, resolved to reduce it to order. Therefore He made this world out of all the *Matter*, and constituted it the boundary of Nature, comprising all things within itself, one only-begotten, perfect with a soul and intellect ; for such is

* What are called the "Pythagorean Fragments" are not the writings of Pythagoras himself, but the doctrines believed to have been held by him, as reported by Timæus the Locrian, Plato, and others. Although there is an extant work written in the Doric dialect bearing the name of Timæus, who is said to have been a teacher of Plato, its genuineness is doubtful, and is in all probability nothing more than an abridgment of Plato's Dialogue in the *Timæus*. There is no doubt, however, that the Greek philosophers had far better conceptions of Deity and matter than what certain dogmas to be found in their writings seem to convey, or than what many sceptics of the present age appear to have. Thus Athenagoras, a Christian philosopher of the second century, points out that "Philolaus, when he says all things are included in God as in a stronghold, teaches that *He is one*, and that *He is superior to matter*. And Plato says, 'To find out the Maker and Father of this universe is difficult, and when found it is impossible to declare Him to all,' *conceiving of one uncreated and Eternal God.*" (*Plea for the Christians*, ch. vi.)

superior to one without either. He gave it also a spherical body, for such of all other forms is the most perfect. Since, therefore, it was His pleasure to render His production most perfect, *He constituted it a god*; begotten indeed, but indestructible by any other cause than by the God who made it, in case it should be His pleasure to dissolve it.

36. Although it is doubtful whether Pythagoras ever wrote any account of his doctrines, it is tolerably certain that Philolaus, his distinguished disciple, who flourished in the time of Socrates, and therefore within a century of his master, has left sufficient in his work on the Pythagorean philosophy to enable us to discover that he undertook, by means of a single primordial principle, the vague problem of the origin and constitution of the universe as a whole; and likewise that he held and taught very distinctly the doctrine of transmigration of souls, which has been set forth so fully in the *Timæus* of Plato, as the chief motive of good believed by the learned Greeks.

37. This doctrine was viewed apparently in the light of a process of purification. Souls under the dominion of sensuality passed into the bodies of animals, or, if incurable, were thrust down to Tartarus, in order to undergo expiation, or to meet with condign punishment. The pure were exalted to higher modes of life, and at last attained to incorporeal existence. In reference to the fruits of such a creed, it is interesting to see that wherever we have notices of distinguished Pythagoreans, we usually meet with characters of uprightness and self-restraint. Pythagoras himself is said to have once been Euphorbus, one of the bravest of the Trojans, who was slain by Menelaus; and that in proof of his assertion he took down at first sight the shield of Euphorbus from the temple of Hera or Juno, in which it had been placed by the victor six centuries before.*

38. Plato's embodiment of the *transmutation theory*, which appears to resemble some of the extraordinary theories propounded in modern times, is to be found chiefly in the *Phædo* and the *Timæus*. In the latter work he describes how wicked men in the first generation were changed into women for their punishment during the second, and thence passed into the tribe of birds, with feathers in place of hair, which were, as he says, "fashioned from men not actually vicious, but over curious concerning things on high." The race of wild animals with feet were made "from men who had made no use of philo-

*—habentque

Tartara Panthoïden, iterum Orco

Demissum; quamvis, clypeo Trojana refixo

Tempora testatus.

Horace, *Carm.* i. 28.

sophy"; and because they disliked intellectual pursuits, "their legs and heads became fixed earthwards, as most suited to their nature;—hence arose the race of *quadrupeds* and *centipedes*." The lowest tribe of *fishes* and *oysters* are represented as sprung from the greatest dunces among men: and hence, argues the Grecian sage, "after this manner, both formerly and now, animals migrate into each other, experiencing their changes through either the loss or acquisition of intellect or folly."*

39. It is curious to observe how the cosmological speculations of the present day have reversed the philosophy of the mightiest intellects of ancient times. Whereas Pythagoras and Plato contend that *fishes* and *oysters* have sprung from the greatest dunces among men, we find these very animals named by our modern philosophers as the lineal ancestors of mankind. From Mr. Darwin we learn that the first of our prehistoric ancestors were Ascidian tadpoles, who, he says, were "the parents of a group of *fishes* as lowly organized as the lancelet; and from such fish" have gradually been evolved "the new and the old world monkeys; and from the latter, at a remote period, *man*, the wonder and glory of the universe, proceeded."† Professor Andrew Jackson Davis, who may be regarded as the Darwin of the United States, very positively asserts that "Man was originally an *oyster* or clam, from which he has progressed to his present condition in the following way. The oyster produced a tadpole, which produced a quadruped, which produced a baboon, which produced an orang-outang, which produced a negro, who produced a white man."‡

40. Plato, however, has promulgated another theory respecting the original condition of mankind, at which it may be well to glance, as it will put us in possession of the singular extravagances which the ancient philosophers permitted themselves to broach in their various theories relating to creation. It is true, as Plato places the following ideas in the mouth of Aristophanes, to whose comedy on the *Birds* I have already alluded, we may suppose that he was caricaturing some fond theory of

* Plato's *Timæus*, § 73. † Darwin's *Descent of Man*, i. 212.

‡ *Principles of Nature*, by A. J. Davis, p. 122. It is satisfactory, however, to believe that the tide is turning respecting the Darwinian creed. Dr. John Arnold, in the Preface to his *Genesis and Science*, observes that "the ignominious defeat of the able materialistic developist, Carl Vogt, at the recent Stuttgart conference of German naturalists by an immense majority, is certainly a sign that the reaction has fairly commenced, and that *in less than ten years* Darwinism, which falsely ascribes to nature what really belongs to culture, will be only remembered as one of the delusions of the past."

his day; but whether it was intended for satire or otherwise, it is clear that some of the *savans* of that time believed it, just as much as certain amongst ourselves believe the parentage of mankind is to be found in an Ascidian tadpole, or as St. George Mivart, an acknowledged authority, describes it, as a "sea squirt."

41. Plato then teaches as follows on this interesting subject:—In ancient times there was no such thing known as distinction of sexes. It was then one man-woman; perfect in form, faculty, and in spirit. The exact shape of this being was a *round ball of flesh* with four hands, four feet, two faces, and one brain. They walked, as now, upright, withersoever they pleased. When they ran, they did so in the manner of tumblers, who, after turning their legs upward in a circle, place them accurately in an upright position; so they supported their legs on their eight limbs, and afterwards turned themselves quickly over in a circle.* Now these beings, which may be described as three in number, were descended, the *male* from the sun, the *female* from the earth, and that which partook of *both* from the moon. The bodies thus were round, and the manner of their running was circular, through their being like their parents.† They were so terrible in force and strength, that, as Homer says of Epiphialtus and Otus, they attempted to scale the heavens and attack the gods. Upon which Jupiter and the other gods consulted what they had best do in their difficulty. At length Jupiter, on reflection, said, I have thought upon a plan by which men on becoming weaker may be stopped in their present course. For now I will divide each of them in two; and they will, at the same time, become weaker, and also more useful to us, through their becoming more in

* It is a curious fact that the arms of the Isle of Man represent three legs of a man turning round, just after the fashion so graphically described by Plato in the text!

† This explanation seems to support the theory that Pythagoras and his followers had some idea of the globular shape of the earth, about 2,000 years before the time of Copernicus. Hence Philolaus of Croton taught the progressive motion of the earth through space; and Aristarchus of Samos and Seleucus of Babylon are both supposed to have taught, not only that the earth rotated on its axis, but also moved round the sun. In truth a passage of Plato in the *Timæus*, when read by the light of Aristotle's comment thereon, would seem to show that they both taught the same. The former says "God made the earth to be the nurse of mankind, and by her rotation round the *cosmical pole*, the guardian and creator of day and night." On which the latter comments thus: "All those who do not make the earth the centre of the system, make her rotate round the centre; and some even of those who place her at the centre say she rotates round the cosmical axis, as we read in the *Timæus*.—Aristotle, *De Cælo*, ii. § 13.

number, and they shall walk upright on two legs ; but if they refuse to keep quiet for the future, I will again divide them, each into two, so that they shall go *hopping on one leg alone*. Thus saying, Jupiter cut men into two parts, as people cut medlars when about to pickle them, or as they cut eggs with hairs. . . . Now when nature had been thus bisected, each half perceived with a longing desire its other self ; so throwing their arms around each other and becoming entwined, they had a great desire to grow together, but they died through famine and idleness. And when one of these halves died, and the other was left, the survivor sought another moiety ; [which in the gentler sex is now termed by the chivalry of the day man's "better half."] From this period has been implanted by nature in mankind a mutual love, which is the bringer together of their ancient nature, which endeavours to make one out of two, and to heal the nature of man. Such, then, was man's original nature. We were once whole. To the desire and pursuit of this whole has the name of LOVE been given. We were originally one, but for our sins we have been cut in two. There is, therefore, reason to fear, unless we behave properly towards the gods, we shall be again cleft in twain, and go about with our noses split in twain, like those who are modelled on pillars in profile, and become, as it were, pebbles cut through and cut smooth. It is meet, therefore, that every man should behave piously towards the gods, that we may, on the one hand, avoid the ills we know not of, and, on the other, find the good we desire to obtain.*

42. We must not omit all notice of the *atomic philosophy* as enunciated by Leucippus, its founder, and more fully developed by his distinguished disciple Democritus. In order to explain his cosmological ideas, the latter maintained that there were in infinite space an infinite number of atoms or elementary particles, homogeneous in quality but heterogeneous in form. These atoms were said to combine with one another, and that all things arise from the infinite variety of the form, order, and position of the atoms in forming combinations, which he terms "chance," in opposition to the *νοῦς* or "mind" of Anaxagoras.

43. Professor Tyndall, in his address to the British Association of 1874, has explained the philosophy of Democritus in this wise. "1. From nothing comes nothing. Nothing that exists can be destroyed. All changes are due to the combination and separation of molecules. 2. Nothing happens by chance. Every occurrence has its cause, from which it follows

* Plato's *Symposium* or *Banquet*, § 16.

by necessity. 3. The only existing things are the atoms and empty space, all else is mere opinion." Then, after specifying more minutely the action of the atoms in their combinations, Tyndall remarks, on the authority of Lange, that "the great enigma, *i.e.* 'the exquisite adaptation of one part of an organism to another part, and to the conditions of life,' more especially the construction of the human body, Democritus made no attempt to solve." And then he adds, what appears difficult to understand, "Thus, more than two thousand years ago, the doctrine of 'survival of the fittest,' which, in our day, not on the basis of vague conjecture, but of *positive knowledge*, has been raised to such extraordinary significance, had received at all events partial enunciation." *

44. Tyndall might have added, in place of regarding this theory as a precursor of Darwinism, that Democritus' theory of "from nothing comes nothing," which probably gave rise to the well-known proverb, *ex nihilo nihil fit*, only forestalled the curious speculation propounded by Professor Oken, of Zurich, who explained his cosmological ideas at the commencement of the present century in the following way:—"The highest mathematical idea, or the fundamental principle of all mathematics, is that zero = 0. Zero is itself nothing. Mathematics are based upon nothing, and, consequently, arise out of nothing. The eternal is the nothing of nature. *There exists nothing but nothing*; nothing but the Eternal. Man is God wholly manifested. God has become man. Zero has become +. For God to become real, He must appear under

* Address delivered before the British Association at Belfast, by John Tyndall, F.R.S., President, pp. 4, 5. It is a curious fact that so distinguished a man as Professor Tyndall should have made such a lapse as he has done in discoursing on the Atomic philosophy. He represents Empedocles as "noticing a gap in the doctrine of Democritus"; whereas the former was at the height of his fame B.C. 444, when Democritus was a lad of sixteen, and who only became a philosopher after his extensive travels in Egypt, Chaldæa, and other countries, many years later, dying B.C. 357. Professor Tyndall's view of "matter" appears to resemble very closely that of the *Stoics* as represented by Athenagoras. (See his *Plea for the Christians*, ch. xxii.) Professor Tyndall's boast concerning what he terms "the impregnable position of science," that "all religious theories, schemes, and systems, which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, in so far as they do this, submit to the control of science, and relinquish all thought of controlling it" (*Belfast Address*, p. 61)—has been singularly contradicted by experimental results. When we recollect the innumerable variations of what some men call "science," and others more correctly "pseudo-science," and compare them with the unvarying testimony of the Bible, we may console ourselves with this well-established axiom—*that not a single fact of science fully ascertained has ever yet been proved to be in opposition to a single statement of Scripture rightly understood.*

the form of the sphere. God is a rotating globe. The world is God rotating. Everything that is, is immaterial. Self-consciousness is a living ellipse. Physico-philosophy has to portray the first period of the world's development *out of nothing*; how the elements and heavenly bodies originated, in what method, by self-evolution into higher and manifold forms, they separated into minerals, became finally organic, and *in man attained to self-consciousness*. There are two kinds of generation in the world, the creation proper, and the propagation that is consequent thereon; consequently, no organism has been created of larger size than an infusorial point. No organism is, nor ever has been created, which is not microscopic. Whatever is larger, has not been created but developed. As the human body has been formed by the extreme separation of the mucous mass, so must the human mind be a separation, a memberment of infusorial sensation!"

45. I venture to think, by comparing the principles of Democritus, as explained by Professor Tyndall, with those of his brother-professor Oken, of Zurich, we shall find a confirmation of the truth of Lyell's saying, to which I have before adverted, that such notions, whether of the first chaotic mass having been produced in the form of an egg, or by the fortuitous concourse of atoms, "do not seem to differ essentially in principle from some cosmological notions of men of great genius and science in modern Europe."*

46. I had purposed adducing the ideas entertained by other nations respecting Cosmogony; such as the Tyrrhenians, Etruscans, Scandinavians, Saxons, Saracens, North American Indians, Mexicans, Azteks, Polynesians, &c., in addition to those

* I observe that in the *Fortnightly Review*, of November, 1875, Professor Tyndall, in his article on *Materialism and its Opponents*, applies the term of "squatter" to those who differ from him, which he defines as "one who settles on new land without a title," remarking that this is the "position of the older theologians in regard to cosmogony and anthropology"; and he claims the right to "attempt to remove them from ground which they have no right to hold." The great question between those who accept Tyndall's theology and that which is derived from Revelation may be thus defined: The Professor says, "MATTER I define as the mysterious thing by which all this is accomplished." The Bible virtually replies that it is MIND, the infinite and eternal Mind, which has created and maintains the Universe. The question then is not so much as to how worlds were formed, but rather by what agency. Professor Tyndall asks us to believe that by inherent forces organisms proceed from inorganic matter, and that "the animal world is so to say a *distillation*, through the vegetable world from *inorganic matter*." By this dogma, which the Professor will never be able to prove, the "older theologians" will naturally be reminded of Jehovah's answer to Job,— "Who is this that darkeneth counsel by words without knowledge?" And in this way we must leave the question of MATTER or MIND.

already mentioned, but want of space requires me to relegate them, either to an Appendix, or to omit them altogether.*

47. I therefore gladly turn to consider what is really the Cosmogony set forth in the Hebrew Scriptures, and what the Jews themselves believed on the subjects therein mentioned. It is necessary to be extremely careful in the examination of this question, for I think it is this want of care on the part of critics which has caused so much misunderstanding as to what the Bible really teaches on the subject of Cosmogony. I allude especially to the unfriendly criticisms of Bishop Colenso and Professor Huxley. I remember, when the former published the first part of his work on the Pentateuch, that Dr. Hermann Adler, son of the Chief Rabbi in London, published a letter in the *Athenæum* of December 6, 1862, asking, "Who but a smatterer in Hebrew would pervert the plain language of the text in the way Bishop Colenso has done?" And also, that the Rev. A. Levie, an English clergyman of the seed of Abraham, in a letter to the *Record*, stated, "there can be no doubt of the fact that unbelieving Jews are scoffing at the recent whimsical display of ignorance and audacity on the part of an English bishop."

48. In a similar spirit Professor Huxley appears to have addressed the assembled clergy at Sion College on November 21, 1867. "You tell your congregations," said he, "that the world was made 6,000 years ago in the period of six days;† and teach that men of science, like myself, who deny this,

* It should not, however, be forgotten that in all these cosmological traditions, as supposed to be held by various nations, there is some degree of doubt as to how far the accounts handed down to us fairly represent the traditions so held; e.g., Two writers in the present day might give very different accounts of the meaning of the various terms employed in Genesis to denote the Mosaic Cosmogony, as indeed, the papers read on this subject before the Institute bear ample evidence to this fact.

† Mr. Warrington, in a paper read before the Victoria Institute, June 4, 1866, says: "Genesis teaches that the whole work of creation, in respect both to heaven and earth, was performed in the short space of six days."—*Transactions*, vol. i. 88. I confess I have read these words with great surprise; and still more to find that in the discussion which ensued no one called attention to this grave mistake, as to the meaning of what Moses really wrote. Professor Huxley, however, is not always so destructive of cosmological theories as he appears to be when speaking of the Biblical Cosmogony. In his *Lay Sermons*, while advocating most earnestly his own idiosyncrasy respecting PROTOPLASM, he appears to defend warmly the materialistic theory of Kant, saying, "In his *Natural History* Kant expounds a complete cosmogony, or theory of the causes which led to the development of the universe, from diffused atoms of matter endowed with simple attractive and repulsive forces, saying, 'Give me matter, and I will build the world.'" (p. 267).

are liable to pains and penalties, as men who are guilty of breaking great moral laws." The only suitable reply to this astonishing statement might be couched in the language of a Parisian wit, who is said to have criticised a work on natural history published by the French Academy, in which a crab was described as "a red fish which walked backwards," with these gentle words, "Admirable! Messieurs; your definition would be perfect, save that a crab is *not* a fish, its colour is *not* red, and it does *not* walk backwards." Even so, I think we may answer the learned professor by saying, that the clergy do *not* affirm that the world was created 6,000 years ago, for the Bible distinctly says it was created "in the beginning"; neither do they affirm that it was created "in the period of six days"; but that it was fitted up for the habitation of man within six periods (whatever the term "day" may mean) they don't deny, for Scripture says it was so; and true science has not yet proved anything to the contrary. But as for teaching that men of science, like Professor Huxley, are guilty of "breaking great moral laws" for denying the cosmogony of Scripture, as our accuser declares, it is one of the wildest hallucinations that ever entered the professorial brain. It may have been so with the clergy of the Church of Rome in the dark ages, but to accuse the clergy of the Church of England* in the middle of the 19th century of such bigotry is unworthy of the profession to which he claims to belong. Such an accusation seems almost to deserve the reproof of the late Hugh Miller, who remarked that "never was there a fancy so wild and extravagant but there have been men bold enough to dignify it with the name of philosophy, and ingenious enough to find reasons for the propriety of the name."

49. In considering the subject of the Hebrew cosmogony as laid down in Scripture, it may be well to bear in mind these two points: 1st. That we should make every effort to ascertain the exact meaning of the words employed by Moses in his description of the world's creation. 2nd. That we should accept the explanation given by the ancient Jews themselves in preference to that of Gentile critics in the present day. I do not mean of such critics as Bishop Colenso, or Professor Huxley, or Mr. Goodwin,† one of the writers of *Essays and*

* I recollect hearing the late Lord Brougham in the House of Lords, about twenty years ago, describe the Church of England as the most liberal and tolerant Church that had ever existed. I have noticed in my "Reply" the case of a clergyman, who, at the beginning of the last century, explained the Mosaic cosmogony in the way that Professor Huxley represents the clergy of the Church of England doing in the present day.

† Mr. Goodwin concludes that the Hebrew word רָקִיעַ *rakia* was not interpreted as "expanse" until by a happy afterthought theologians attempted

Reviews, whose disqualification for the task they have assumed must be manifest to all men; but of eminent scholars like Gesenius, Ewald, and others, who, however high their attainments as Hebraists, are not sufficient to warrant our ranking them above the acknowledged authority of the Rabbinical teachers and learned Jews themselves.

50. This may be illustrated by our understanding of a term which has been the subject of much criticism in the present day. It has been generally understood by Christian commentators of the first sentence in Scripture, "In the beginning God created," &c., that from the peculiar construction of the Hebrew—a plural nominative governing a singular verb—we have a clear intimation of the doctrine of the Trinity. Modern criticism has been careful to deny this; and yet, if we refer to the learned Jews, who lived before the fuller revelation of Gospel light, we have a distinct intimation that such was the case. Take, for example, the teaching of *Zohar*, a work of the highest authority amongst the Jews, composed by *Simeon bar Juchai* in the century preceding the Christian era, which thus speaks on the doctrine of the Trinity: "THERE ARE THREE LIGHTS IN GOD; the ancient light, or *Kadmon*; the pure light, or *Zach*; the purified light, or *Mezuchzach*; and THESE THREE MAKE BUT ONE GOD." Many other passages of a similar nature might be adduced from the writings of learned Jews, showing the difference between their teaching and the results of modern criticism respecting the Trinity.

51. Further, as regards the Hebrew cosmogony, we cannot forget that it claims to be a revelation of the Divine Will, and as such it is impossible that there can be any conflict between what are really and truly the works and the word of

to reconcile science and Scripture. Had he read more on this subject, he would have known that ages before the science of geology existed one of the earliest translations of the Bible was that by Paginus, a Dominican monk, born A.D. 1470, the profoundest Hebrew scholar of his age. And he, with Montanus Benedictus, who was appointed to revise this translation in the middle of the following century, renders the Hebrew *rakia* by the Latin *expansionem*. So Bishop Colenso, in his attempt to decry our English version of the Bible, which speaks of the priest "carrying forth the whole bullock without the camp," &c. (Leviticus iv. 12), appears to be unaware that the Hebrew verb *hotzia* is of the Hiphhil form, and has a *causative* signification, meaning that "the priest shall *cause* to carry forth," or "have carried out," as Buxtorf, Gesenius, and all Hebraists teach. The English phrase "I have carried my hay," exactly expresses the meaning of what Moses wrote. If either of these opponents of Scripture had studied such a work as Origen's Answer to Celsus' sceptical objections to the Mosaic cosmogony (see especially lib. vi. c. 60, et seq.), I do not think they would have committed themselves in the way they have done.

God. Hence the force of this just axiom, that not a single fact of science fully ascertained has ever yet been proved to be in opposition to a single statement of Scripture rightly understood. At the same time it must be acknowledged how differently this is understood by various classes at the present time. There are those who believe without investigation, because they conscientiously believe the Bible to be the revealed will of God; there are others who believe after the strictest investigation; there are those who, after investigation, deny God *in toto*, like the German Büchner, or the English Bradlaugh; there are those who stand midway between Atheists and Theists, like Professor Tyndall, and content themselves with a sort of ideal Deity of their own composition; while others, like Herbert Spencer, are unable to make up their minds as to the existence of a God or not, consoling themselves with such reasoning as this: "I do not affirm there is no God. I am simply between the two statements. Some say there is a God; some say there is not; I only say *I am not aware of it.*" *

52. I think, therefore, it may be safely affirmed without presumption that, in order to understand the cosmogony as sketched out, rather than dogmatically laid down, in Scripture, there must be before all a sincere belief in revelation, together with a competent amount of Biblical scholarship, and some knowledge of the elements of modern science. The chief objectors to the Hebrew cosmogony in our own day may know much of the last, less of the middle, and apparently nothing whatever of the first. As a rule, they present a striking contrast to that master mind in all genuine science, Sir Isaac Newton, whose humility and genius were alike conspicuous in his memorable avowal, which they would do well to imitate:—"I am but as a

* See *Transactions of the Victoria Institute*, vol. vii. p. 160. What a contrast to the well-known teaching of one of England's greatest philosophers. "Undoubtedly," wrote Bacon, "a superficial tincture of philosophy may incline the mind to atheism, yet a farther knowledge brings it back to religion. For on the threshold of philosophy, where second causes appear to absorb the attention, some oblivion of the highest cause may ensue; but when the mind goes deeper, and sees the dependence of causes and the works of Providence, it will easily perceive, according to the mythology of the poets, that the upper link of Nature's chain is fastened to Jupiter's throne. Let none weakly imagine that man can search too far, or be too well studied in the book of God's word and works,—divinity and philosophy; but rather let them endeavour an endless progression in both, only applying all to charity and not to pride—to use, not ostentation, without confounding the two different streams of philosophy and revelation together." (*Advancement of Learning*, book i. p. 32.) See "Reply" respecting the real opinions of Herbert Spencer and Professor Tyndall.

child standing on the sea-shore of the ocean of truth, and playing with a little pebble which the waters have washed to my feet.”

53. We come now to the question at issue among ourselves. What does the Bible really teach, and what did the Jewish people, for whom it was written, really believe respecting the Mosaic record of creation? Adopting a more literal rendering than is to be found in our admirable Authorized Version, and combining with it a few other passages besides the Mosaic account, in order to elucidate more fully the correct teaching of Scripture, I believe the following will be found to convey a fair representation of all the information contained in the Bible respecting the Hebrew cosmogony.

54. In the beginning was the Word (ὁ λόγος), and the Word was with God, and the Word was God (John i. 1). In the beginning, before the earth existed (Proverbs viii. 23), God the Eloheem, *i.e.* the Trinity, called into existence, by a sovereign act of creative power, the Essence of the Heavens and the Essence of the Earth (Genesis i. 1).^{*} Moreover, the Creator hung the earth upon nothing, as a ball in the air, poised with its own weight, and kept in this manner by the power of gravity (Job xxvi. 7). Now God did not create the earth empty (Isaiah xlv. 18); but the earth became empty and desolate; and there was darkness upon the surface of the deep. And the Spirit of God brooded upon the face of the waters (Genesis i. 2).

FIRST YOM.

55. And God said, Let there be light, and there was light. And God saw the essence of light that it was good; and God made a division between the light and between the darkness. And God called the light YOM (day), and the darkness He called Night. And there was evening, and there was morning, one peculiar YOM (Genesis i. 3—5).

SECOND YOM.

56. And God said, Let there be an atmosphere or expanse in the midst of the waters, and let it divide between the waters.

^{*} The following is a comparison between the ancient Hebrew characters, such as we may suppose Moses used on the occasion, and the modern Hebrew characters :—

7 L K Y

Ancient.

ד ה כ י

Modern.

And God prepared the atmosphere, and a space between the waters which were above the atmosphere, and it was so. And God called the expanse "SKY," and there was evening and there was morning, a second YOM (Genesis i. 6—8).

THIRD YOM.

57. And God said, Let the waters under the sky be gathered to one place, and let the dry ground appear, and it was so. And God called the dry ground "EARTH," and the assembling of the waters He called "SEAS," and God saw that it was good. And God said, Let the Earth sprout forth the green grass, the green herb bearing seed, and the fruit-trees bearing fruit according to its kind, whose seed is in itself, and it was so. And the earth brought forth the green grass and the green herb bearing seed according to its kind, and God saw that it was good. And there was evening, and there was morning, a third YOM (Genesis i. 9—13).

FOURTH YOM.

58. And God said, Let there be light-bearers in the expanse of the heavens to separate between the YOM and between the Night; and let them be for signs and for the seasons, and for days and for years. And let them be for light-bearers in the expanse of the heavens to afford light on the earth, and it was so. And God appointed the two great light-bearers—the chief light-bearer for ruling the day, and the lesser light-bearer for ruling the night, and the stars likewise. And God so arranged them in the expanse that they should give light upon the earth, and rule over the YOM and the Night, and divide between the light and between the darkness; and God saw that it was good. And there was evening and there was morning, a fourth YOM (Genesis i. 14—19).

FIFTH YOM.

59. And God said, Let the waters swarm with animal life; and let birds fly above the earth in the open sky. And God called into existence the long-stretched * monsters of the deep,

* תנינים means properly sea monsters, huge whales, serpents, crocodiles, &c., from an unused verb תנן signifying "to extend," as in the Sanscrit and other Indo-Germanic languages. Hence, says Gesenius, it refers to the vast fishes of the deep, so called from their enormous length; as whales, by far the greatest monsters of creation, have been known to extend to over 100 feet in length.

and all animals endued with life with which the waters swarm, according to their kinds; and the birds of the air after their kind; and God saw that it was good. And God blessed them, saying, Be fruitful and multiply, and fill the waters in the seas, and let the birds multiply on the earth. And there was evening and there was morning, a fifth YOM (Genesis i. 20—23).

SIXTH YOM.

60. And God said, Let the earth bring forth all animals after their kind, domestic cattle, and reptiles and wild beasts after their kind; and it was so. And God made the wild beasts of the earth after their kind, and domestic cattle after their kind, and all reptiles of the earth after their kind; and God saw that it was good. And God* said, Let us make man in our image (= outline) after our likeness (= filling up the outline); and let them have dominion over the fish of the sea, and the birds of the air, and over the domestic cattle, and over all the earth, and over every creeping thing that creepeth upon the earth. So God called man into existence after His own image; male and female created He them. And there was evening and there was morning, a sixth YOM (Genesis i. 24—27).

SEVENTH YOM.

61. At the beginning of the seventh YOM God finished His work; and He rested then from all the work which He had done. And God sanctified the seventh YOM, because that in it He rested from the work which He intended to perform† (Genesis ii. 2, 3).

62. Before entering upon an investigation of the Mosaic record respecting Creation, I would adduce the testimony of a noted French writer in the present day as a fair specimen of the

* As some critics, like Bishop Colenso, have assumed that because the name "Jehovah" is not found in the first chapter of Genesis, as it is in the second, therefore it is a proof that they must have been written by two different hands. But this rather proves ignorance of the Hebrew language on the part of the critic. For when it is written "God said" (*yo-mer*) we understand Jehovah to be the speaker. If Moses, instead of writing "God said, let us make man, and God blessed the seventh day," had written "The Lord said, and the Lord blessed," &c., the Jews would have understood that some one commissioned to speak and to bless had done so in the Lord's name. And this is the reason why the word Lord or Jehovah is not found in the narrative of the Mosaic cosmogony.

† The literal rendering of this last phrase is "which God created to make." So the *Targum* of Onkelos and the Syriac version render it. The Vulgate translates it, "which God created that He might make it."

way in which a class of writers, to whom I have before alluded, are in the habit of speaking of the Hebrew cosmogony. "No one," says M. About, as reported in the *Christianisme au XIX^{me} Siècle*, "any longer defends the cosmogony of Moses; one hardly dares to teach children from the catechism about the *creation of light before the birth of the sun*, the formation of the world in seven [? six] days; or the legend of Adam moulded like a marble statue, and of Eve formed out of a rib of her husband."

63. It would be difficult to give clearer proof of the most crass ignorance than this specimen of French philosophy in the middle of the nineteenth century.* The Mosaic cosmogony has been defended by illustrious Frenchmen, such as Cuvier, Brongniart, Prevost, and other philosophers of the present day, of whom M. About must have heard. The existence of light *independent* of the sun (not as M. About terms it, "*before the birth of the sun*") is one of the brilliant discoveries of modern science; the objection originally came from Voltaire, at whom the merest tyro in science may well smile, just as men will hereafter smile at him who now reproduces his sceptical sneer. The formation of the world as it now appears to us in six (not seven, as M. About curiously says) *yoms* or periods has been believed in and expounded by Descartes, Bacon, Newton, Leibnitz, Euler, and others, all of whom are still authorities in modern science. Thus much in answer to M. About.

64. But to return to the consideration of what the Bible really teaches respecting the formation of the world. We may

* M. About's knowledge of the Hebrew cosmogony appears to be on a par with that of Mr. Goodwin's, whose infidelity is but thinly concealed in the unsupported accusations which he brings against those who believe in the Divine record. Ignorance the most profound, joined to dogmatism the most presumptuous, is a marked characteristic of the sceptic's creed; of which we have a fair specimen in Mr. Goodwin's statement that "the plain meaning of the Hebrew record is unscrupulously tampered with, and in general the pith of the whole process lies in divesting the text of all meaning whatever!!! Physical science goes on unconcernedly pursuing its own paths. Theology maintains but a shivering existence, shouldered and jostled by the sturdy growths of modern thought, and bemoaning itself for the hostility which it encounters"!!! (*Essays and Reviews*, p. 211.) As the above statement does not appear to be redeemed by a single particle of truth, we can afford to pass it by in remembrance of the advice given by the wise King of Israel, "Answer not a fool according to his folly, lest thou also be like unto him." The literary world seems to be of a similar opinion, for probably no book of such lofty pretensions has ever had so great a fall as that of the notorious *Essays and Reviews*. As a specimen of Mr. Goodwin's knowledge of geology, he talks about "the *first* records of organisms presenting themselves in the so-called Silurian system" (p. 214), whereas the merest tyro knows that the Laurentian beds of Canada, which *underlie* the Silurian system, contain sure proof of organic life.

confidently assume from those passages which have been already adduced respecting the Hebrew cosmogony, the truth of the following propositions:—1st. That a self-existent Creator in the beginning called the earth into existence; and that this earth is poised in the air, balanced by its own weight. 2nd. That He did not create it “empty,” or, as a heathen philosopher would term it, in a chaotic state. 3rd. That it subsequently became “empty.”* 4th. That light exists independent of that which the earth receives from the sun. 5th. That during a certain period, termed six YOMS, the Creator prepared the earth for the use of man. 6th. That man is an entirely separate act of creation on the part of the Divine Being. 7th. That after this had been accomplished, God rested from the creative work which He had done.

65. Thus we have in the cosmological record of the Hebrews a clear, and as far as it goes, a scientific statement of the origin of the universe, not yet superseded by the theories of the speculative philosophy, nor contradicted by the discoveries of modern science; but sufficient to prove that it was made known to the writer as a revelation from on high. Had the objectors to this revelation been better acquainted with the language in which it was written, they would not have committed themselves to such marvellous mistakes as, *e.g.*, of asserting that Moses taught the earth was created only 6,000 years ago; that it was immovably fixed in its position; that he makes the birds fly through a solid vault; that the term YOM must mean a period of twenty-four hours, and can mean nothing else; that the

* This appears to have been the view of Dr. Buckland, as he says in his *Bridgewater Treatise*: “The word *beginning* as applied by Moses expresses an *undefined period of time*, which was antecedent to the last great change that affected the surface of the earth, and to the creation of its present animal and vegetable inhabitants, during which period a long series of operations may have been going on; which, as they are wholly unconnected with the history of the human race, are passed over in silence by the sacred historian, whose only concern was barely to state that the matter of the universe is not eternal and self-existent, but was originally created by the power of the Almighty..... The first verse of *Genesis* seems explicitly to assert the creation of the universe, the heaven, including the sidereal systems, and the earth more especially specifying our own planet as the subsequent scene of the operations of the six days about to be described..... Millions of millions of years may have occupied the indefinite interval, between the beginning in which God created the heaven and the earth, and the evening or commencement of the first day of the Mosaic narrative..... We have in verse 2, a distinct mention of earth and waters, as already existing, and involved in darkness; their condition also is described as a state of confusion and emptiness (*tohu bohu*), words which are usually interpreted by the vague and indefinite Greek term chaos, and which may be geologically considered as designating the wreck and ruins of a former world.”

author of this cosmogony was no better than a mere Hebrew Descartes, possibly somewhat in advance of the intellects of his age. It would be well for such objectors if they could receive what Ewald has said in his comment on Genesis i. 1—ii. 4, that “the aim of the first connected narrative is to exhibit God as the Creator of the universe. The author then passes over from the perfected picture of the created universe to that which must have been to him, as to all writers of history, the most worthy of note—to the history of man. Yet he closes the first picture with the words—‘These are the generations of the heavens and the earth.’”*

66. In comparing the Hebrew cosmogony with the discoveries of true † science, it may be well to consider them under these several heads:—1st. The creation of the universe. 2nd. The existence of light. 3rd. The duration of the term translated “days.” 4th. The formation of man.

67. First, as regards the creation of the universe. It has been contended by some that the Mosaic cosmogony represents a distinction in point of time between the creation of the heavens and of the earth; as if the stellar worlds of light (those unanswerable proofs of a Divine Architect, to use the argument of Napoleon I.) which are hung around us on all sides of the universe were made at one time, and earth with its ruler, man, was made at another time. But such is *not* the teaching of the Word of God. Nothing can be plainer than the declaration that the heavens, containing the whole stellar system, and that the earth, a small planet in the solar system, were called into existence simultaneously. “In the beginning God created the heavens and the earth.” In these few simple words, if our finite minds are only able to fathom their full meaning, are contained all the depths of philosophy which the wit and wisdom of man have enabled him to discover; he can add nothing thereto; he can take nothing therefrom; and it should be his unceasing endeavour to understand what they teach, in order that the wit of man may not contradict the wisdom of God.

* Ewald's *Composition per Genesis*, p. 192.

† I am obliged to use the word “true”; for much that passes in the present day under the name of “science” is anything but true, and must be distinguished by the term “pseudo-science.” The differences between those who claim for themselves the name of *Savans*, especially on the subject of *geology*, are so numerous and so great, that they may be fitly compared to the little difference between John Stuart Mill and the author of *Ecce Homo*, respecting “Christian morality,” of which the former, in his *Essay on Liberty*, p. 29, says, “in its precepts ‘*thou shalt not*’ predominates over ‘*thou shalt*’”; Whereas the latter declares respecting the same, “The old legal formula began ‘*thou shalt not*,’ the new begins ‘*thou shalt*’” (p. 175).

68. It is unnecessary to enter at any length upon Hebrew criticism in our proposed reading of the first verse of the Bible. It has been so fully and well done in *Aids of Faith*, by the late Dr. McCaul, who was confessedly one of the first Hebrew scholars of the day, that, with the exception of one single point, which I shall presently mention, he has left nothing to be desired in confirmation of the truth of these words respecting the creation of the heavens and earth. It will be sufficient to notice that Moses, in using the term "*In the beginning*,"* expresses *Duration or Time*, previous to Creation; that the Hebrew word ברא *hara*, although not necessarily meaning *creation out of nothing*, is always used in Scripture to denote the work of God and not of man; and here, as elsewhere, something *new*, which did not exist before. Hence the learned Gesenius says, in reply to those who contend that this word implies the eternity of matter,—“It is abundantly plain that the use of this verb in *Kal* is altogether different from its primary signification, and that it is more used of *new production* (*Genesis* ii. 3) than of the conformation and elaboration of matter. But that in *Genesis* i. 1, the first creation of the world out of nothing is proved by the connection of things in the whole chapter. Thus, also, the Rabbis (see *Aben Ezra in loco*) say, ‘that creation is a production of something from nothing.’” †

69. Hence it will be seen in the translation I have adopted as more exactly conveying the literal sense of the original, the term, “the *essence* of the heavens,” and “the *essence* of the earth,” which is rendered by את *eth* in the Hebrew, is understood to signify “essence,” or “substance,” by the Jews themselves. ‡ In this brief record of the Divine act and will we have all that the comparatively infant science has been enabled to discover after a virtual search of 6,000 years of the condition

* Lightfoot relates a curious story concerning the word בראשית recorded in both of the Talmuds—of the seventy elders, employed by Ptolemy Philadelphus to translate the Hebrew Scriptures, that they wrote the first sentence of the Pentateuch “God created in the beginning,” not as in the Hebrew, “In the beginning God created”; fearing lest the king should say, “BERESHEH is God, and that there were two powers, and that the first created the latter.” (*Exercitations upon 1 Cor.* viii.)

† Gesenius’s *Thesaurus*, in loco.

‡ Both *Aben Ezra* and *Kimchi* affirm that the particle את signifies “substance” (*Sepher Shorash*, rad. את). And *Maimonides* observes that it is the same as “with”; and then the sense would be, “God created with the heavens whatsoever are in the heavens, and with the earth whatsoever are in the earth, i.e. the substance of all things in them both.” (*Moreh Nevochim*, par. 2, ch. 30.)

of the earth during the geological periods, previously to the preparation of earth for the use and habitation of man.

70. Dr. McCaul, in his valuable essay on the *Mosaic Record of Creation*, had mentioned as an instance of the scientific accuracy of the Mosaic account, that, "before the human period there was no difference of climate, and that there was, apparently, one uniform high temperature over the whole earth; and, consequently, that the flora and fauna of warm climates are found in latitudes where they could not now exist" (*Aids to Faith*, p. 219). Now, although some have sneered at this statement, it is undoubtedly true that, until lately, the scientific world supposed that the flora of the carboniferous era, which extends as far north as Baffin's Bay,* indicated an almost tropical temperature; but, as in a multitude of other instances, † science has now adopted a different view on this subject, and, though it does not affect any statement of Moses in the slightest degree, we may readily accept the opinion of the late Sir Charles Lyell, who says,—and I beg you to note his words, "*It seems to have become a more and more received opinion that the coal plants do not on the whole indicate a climate resembling that now enjoyed in the equatorial zone. A great preponderance of ferns and lycopodiums indicates moisture, equability of temperature, and freedom from frost rather than intense heat*" (*Elementary Geology*, p. 399). A remarkable work, published last year, entitled, *Climate and Time in their Geological Relations: a Theory of Secular Changes of the Earth's Climate*, by James Croll, of H. M. Geological Survey of Scotland, has fully discussed this subject in all its bearings; and the learned author has, I venture to think, shown some reasons for believing:—1st. That the old internal heat theory must be abandoned, in consequence of Sir W. Thomson's conclusion that the general climate could not have been sensibly affected by intense heat at any time more than 10,000 years after the solidification of the earth's crust, though there is evidence that its climate was much hotter during

* The author of *Vestiges of the Natural History of Creation*, says, "In the coal of Baffin's Bay, of Newcastle, and of the torrid zone, alike, are the fossil ferns arborescent, showing that, in that era, the present tropical era, or one even higher, existed in very high latitudes."

† In Mr. Croll's work on *Climate and Time*, I have counted over thirty instances, which he mentions, wherein *savans* materially differ from each other in their interpretations of various points connected with the earth's climate; e.g. to mention one, Humboldt estimates that it would require 7,200 years to form a bed of coal a yard thick; Dr. Heer, of Zurich, contends that only 1,400 years would be required to effect this! (p. 429).

Palæozoic ages than now. 2nd. That the ocean currents are the chief agents employed in the distribution of heat over the globe. 3rd. That while, during portions of the Glacial period, England and much lower latitudes had an Arctic condition of climate, yet, during other portions termed "Interglacial," a warm condition extended to Greenland and the Arctic regions generally, which then were not only free from ice, but covered with a rich and luxurious vegetation. 4th. That this condition of things is accounted for on the theory of a great increase in the eccentricity of the earth's orbit, which brings into operation a series of physical agencies, the direct tendency of which is to lead to a glacial condition of things on the hemisphere whose winters occur in aphelion, and a warm and equable condition of climate (interglacial) on the opposite hemisphere, whose winters, of course, occur in perihelion. The precession of the equinoxes reverses the condition of each hemisphere alternately, about every 10,000 years as long as the eccentricity continues at a high value, which eccentricity about 850,000 years ago Mr. Croll computes at 0.0747.*

71. Hence we may reasonably conclude that what has hitherto been a somewhat perplexing knot for our geologists, naturalists, and botanists to untie, may now be accounted for by the hypothesis of Mr. Croll as given above. All these things, and various other matters, which have been so fully, ably, and temperately discussed by Mr. Croll in his work on *Climate and Time*, may serve to explain the problem of a past flora and fauna existing in latitudes where at present they are unknown.

72. The older and more perfect science of Astronomy confirms the view derived from Geology, so far as it bears upon the meaning of the antiquity of the heavens and earth, which may have been created myriads of millions of years just as readily as thousands of years ago, so far as the words of Scripture are concerned. But that it could not mean merely 6,000 years ago, the limit of man's antiquity on earth accord-

* "How totally different," says Mr. Croll, "must have been the condition of the earth's climate at that period, from what it is at present! Taking the mean distance of the sun to be 91,400,000 miles, his present distance at mid-winter is 89,864,480 miles: but at the period in question, when the winter solstice was in perihelion, his distance at mid-winter would be no less than 98,224,289 miles. But this is not all; our winters are at present shorter than our summers by 7.8 days, but at that period they would be longer than the summers by 34.7 days. At present the difference between the perihelion and aphelion distance of the sun amounts to only 3,069,580 miles, but at the period under consideration it would amount to no less than 13,648,579 miles!" (*Climate and Time*, p. 359.)

ing to revelation, may be seen in this. Science has enabled man to discover the speed at which light travels through space,* and by this means to have some faint conception, not only of the magnitude of creation, of the greatness of the Creator, and of the insignificance of the created, but also of the time which must have elapsed since the heavens and the earth were called into existence by the will and power of God. Assuming light to travel at its well-ascertained speed of 192,000 miles each second of time, it passes from the moon to the earth in rather more than one second; from the sun to the earth in about eight minutes; but to Neptune, the most distant planet yet discovered in the solar system, upwards of four hours are consumed in its flight. A parallax has been found for each of the nine fixed stars, or suns to other systems, which form what astronomers term "stars of the first magnitude," and the result is seen in the computation that light proceeding at the same speed requires *three years* to pass from a *Centauri*, the nearest of the fixed stars, to our system; while from Capella, the farthest fixed star of the first magnitude, a period of seventy years would be required. But even this is as nothing compared with what science has further determined respecting the magnitude of the Universe, and the consequent distance of some of the stellar orbs from our system, when the heavens and the earth were originally called into existence by their Omnipotent Creator.

73. It is nearly a century ago that a foreign musician, at that time in the comparatively humble position of organist at the Octagon Chapel, Bath, who was subsequently known as the celebrated Sir William Herschel, and father of another eminent astronomer in the person of Sir John Herschel, conceived the grand idea of gauging the universe with the assistance of his newly-formed telescope, which then excited the wonder of the age. It would require too much time to detail the means employed by this illustrious discoverer; it will be sufficient to name some of the results, which may be expressed in

* Roemer, the Danish astronomer, by means of Jupiter's satellites, was the first to discover the estimated speed of light; the accuracy of which has been confirmed by Professor Wheatstone's test of a rotating mirror, in which artificial light is made to pass over a distance of 30,000 feet to the same point from which it emanated. Herr Bessel, of Germany, was the first to give Roemer's discovery a practical value, by finding a parallax for a fixed star marked in the maps as "61 cygni," which proved its distance from us to be such as to require light, travelling at the rate of 192,000 miles each moment of time, a period of nine years to reach our system. A grand achievement in the progress of science, which Sir John Herschel has justly termed "the greatest and most glorious triumph that practical astronomy has ever witnessed."

a few words. A star of the 6th magnitude would require a period of 2,656 years for its light to reach our system ; so that the star thus seen by the telescope is not necessarily as it now appears, but as it existed 2,656 years ago ; so that, supposing such a thing possible, if a telegraphic message had been sent off by light as the agent, and therefore travelling at nearly twenty times the rate of our electric telegraph, to a star of the 6th magnitude, at the date of the building of Rome, B.C. 753, it would have required twenty-eight years more of travel before it could have reached its destination.

74. Stars situated in the more remote edges of the Milky Way require a period of 20,000 years for the transit of their light, *according to the original calculations of Herschel*, though these are now questioned ; and the splendid nebula in Orion,* a portion of which has been proved by the spectroscope to be of a strictly nebulous or gaseous matter, and which was unresolvable until the power of Lord Rosse's gigantic telescope was brought to bear upon its beams, would absorb 60,000 years for the transit of its light to our system. And to proceed one step further, if, as Professor Nichol has finely contended, "*we take the guidance of analogy*, it may be asserted without hesitation, although not apart from a feeling next to overwhelming, relating to the awful realities within which our frail lives are passing—that if any of those Milky nebulae *first seen* by the six-foot mirror of Lord Rosse's telescope, and left irresolvable until art shall achieve some new and mighty advance—if any of these are like the grand object in Orion, they may be so far off in space that light does not reach us from them in less than *thirty millions of years!*"

75. Thus far the science of astronomy confirms the teaching of Scripture relative to the antiquity of the heavens and the earth. And, so far from the next statement of Moses being in opposition to the discoveries of the younger and inferior science of geology,† it must be regarded as in complete accord with what geologists have at length found out; for, after the declara-

* See "Reply," for remarks on the nebulae in Orion.

† The science of Geology can scarcely be called a century old ; and the innumerable contradictions of its teachers have in a great measure reduced it to a series of conjectural speculations, at least compared with the logical demonstrations and masterly proofs belonging to the science of astronomy. Who questions the discoveries of Copernicus or Newton ? While, on the other hand, what geologist of note has not had occasion to modify his own views during his lifetime, as Sir Charles Lyell and others have frankly confessed ? The variations of geologists can only be described under the term "Legion," as a French author justly remarks :—"Depuis l'époque de Buffon, les systèmes se sont élevés les uns à côté des autres en si grand nombre, qu'en 1806, l'Institut de France comptait plus de quatre-vingts théories hostiles aux saintes Écritures ; AUCUNE n'est restée debout jusqu'à ce jour." (*La Bible et la Science moderne*, par M. E. Panchaud, p. 13.)

tion of ver. 1, which includes, as I have before remarked, all the long geological periods up to the end of the tertiary, ver. 2 teaches that the earth was reduced to a condition different from its previous one, as it is said "the earth became empty and desolate,"—i.e., in a chaotic state,—previous to its being prepared by its Maker for the use of man. I am aware that some interpret these words as our English version reads, "the earth was without form and void," implying that it means then God commenced reducing chaos to a state of order in accordance with what geology asserts respecting the first dawn of organized life on the face of the globe. But not only are the LXX. and the Vulgate versions generally in conformity with the English word "became," in preference to the authorized version "was," inasmuch as the Hebrew verb היה, *ha-y-ah*, is twenty times in this chapter translated by the Greek and Latin γίνωμαι and *fit*, and not by εἶμι, or *sum*; but also the teaching of the book, "Zohar," a work, as I have before remarked, of the highest authority with the Jews, distinctly points to the same view. Thus, it is written:—"These are the generations of *tho-hû* which are signified in Genesis i. 2. The earth was *tho-hû* and *bo-hû*—i.e. empty and desolate; and they mean that the blessed God originally created the worlds and then destroyed them; and for that reason the earth became empty and desolate."*

76. I believe, therefore, that the declaration in ver. 2, of the earth becoming empty and desolate after having been previously filled with organized life, pointedly refers to that last change which took place in the physical appearance of our globe, and known to geologists under the term, the "post-tertiary era." During previous ages the atmosphere of our globe must have been of a very different temperature from what it is at present, as the coal of Baffin's Bay and other places of very high latitudes proves that there must have once existed there a different climate from what it has now; though whether of a tropical nature

* Excerpta from Zohar on Genesis ii., by Ludovicus Capellus, quoted by Dr. Baylee (*Transactions of the Victoria Institute*, vol. iii. p. 260). Dr. Pye Smith quotes Dr. Dathe of Leipzig, a cautious and judicious critic, as rendering the passage in Genesis thus:—"In the beginning God created the heaven and the earth. But afterwards the earth became waste and desolate." (See *The Relation between the Holy Scriptures and Geological Sciences*, by Pye Smith, D.D., fifth edition, p. 249; and also the valuable supplementary Note B., p. 435.) Dr. Pusey, in the Preface to his *Lectures on Daniel the Prophet* (see pp. xix. lxxxiii. et seq.), appears to adopt the same view, if I do not misunderstand him, but he writes, unfortunately, in such a profuse and mystified manner, that one is not quite sure what is the exact meaning of this learned author. The best work, however, where the subject is exhaustively discussed, is to be seen in Dr. McCaul's *Essay on the Mosaic Record of Creation*, in *Aids to Faith*.

we are unable to say; for, as Lyell points out, "heat hastens the decomposition of leaves and trees, whether in the atmosphere or in the water, and we know too little of the sigillaria and other peculiar forms of the carboniferous period to be able to speculate with confidence on the kind of climate they may have required."*

77. But this we do know, that all these magnificent coal-fields, extending more or less through the geological periods, must have been designed by a wise and provident Creator; not for the creatures which existed on earth after their first formation, but solely for the use of that being made in His image and after His likeness in the person of MAN. And herein consists one of the many enormous gulfs between Man and Beast, which some philosophers are vainly doing their utmost in the present day to minify as much as possible, in order to adopt the wildest hypothesis that was ever conceived in the human brain, of seeking to show man's pedigree from an ascidian tadpole and an Old World monkey; for it is well known and admitted by all *savans* that those animals which have approached nearest the human in the way of reason or instinct, have never had the slightest conception of the meaning of those vast coal-fields which the Creator has provided so beneficially for the use of man.†

78. This will lead us to the consideration of the declaration of Moses respecting the existence of LIGHT. "And God said, Let there be light, and there was light." It may be fairly assumed that in the whole range of literature from the beginning of time nothing has ever equalled this sublime speech respecting the creation of that to which the Creator likens Himself; for "God is Light," as St. John taught, and, as St. Paul declares, "dwelleth in light which no man can approach unto"; since it argues uncontrollable authority and omnific power. And it

* Lyell's *Elements of Geology*, c. xxv. p. 501.

† An anecdote is told of the late George Stephenson once asking Dr. Buckland, on seeing a train rush by, "What propels those carriages?" "Steam," was the natural reply. "But how is steam produced?" retorted Stephenson. The man of theory and science, knowing it would be useless to say, "Because water boils," was discreetly silent, when the self-taught and practical engineer made this memorable reply:—"It is light bottled up in the earth for tens of thousands of years." A most original idea. Like a flash of lightning it illuminated an entire field of science. For coal, as is well known, is the formation of decayed vegetable matter, which would inevitably perish, were it not for the absorption of light, by which its vitality has been retained in another shape as countless ages have rolled by. Light absorbed by plants and vegetables is necessary for the condensation of carbon during the process of their growth, and now after being buried for so vast a period in fields of coal, that long-hidden light is again brought forth and made to work, as in the produce of steam, for the use of man!

was no slight testimony to the inspiration of this passage that when the celebrated heathen Dionysius Longinus first met with this sentence in the LXX. Version, he described their effect on his mind in these striking words:—"The Jewish lawgiver, who was no ordinary man, having conceived a just idea of the Divine power, expressed it in a dignified manner, for at the beginning of his laws he thus speaks:—'GOD SAID,—*What? LET THERE BE LIGHT! And there was light.*'"*

79. An objection has been raised by infidels of old like Celsus, and revived by modern sceptics like Voltaire and Goodwin in our own day, to this part of the Mosaic cosmogony, that the author represents light to have existed before and independent of the sun. But, passing by the fact that Moses only says respecting the sun, as one of the heavenly bodies which were "created in the beginning," that at a certain time of His preparing earth for the habitation of man, God appointed the chief light-bearer in the solar system to give light to the earth during the day, it does not conflict with his previous assertion that there was light independent of the sun, for modern science has at length discovered that such is indeed the case.

80. Had Moses been a mere speculator, well posted up in the scientific conceptions of his own day, or, as Mr. Goodwin terms him, "some Hebrew Descartes or Newton," he would not have recorded the creation of light as separate from sunlight. But in this seeming inconsistency we have one of the strongest testimonies possible to the Divine authority of the Mosaic cosmogony; for science teaches that the sun, though supreme in our system, is not the only source of light, but that there is, throughout the endless regions of space, a fine, subtle essence, called *ether*, which, restrained by no limits, washes the remotest shores of the universe with an invisible ocean, and which is of so refined a nature that the stars move through its depths very slightly affected by what is termed, *the resisting medium*, which astronomers consider identical with the luminiferous ether. † Hence arise those waves, or undulatory motions,

* Dion. Long., *On the Sublime*, § 9.

† As certain phenomena of optics require for their explanation a vehicle for light, so certain phenomena of astronomy demand for their satisfactory explanation the existence of a subtle fluid, such as the luminiferous ether is conceived to be. Hence Encke, in his *Dissertation on the Comet*, which bears his name, observes:—"Another question is this, whether the hypothesis of a resisting medium gives the true and probable explanations, though hitherto no other appears to have equal weight." On which the Astronomer Royal says: "There can scarcely be a doubt that the hypothesis of a resisting medium, or something which produces almost exactly the same effect, is the true one."—Airy's *Translation of Encke's Dissertation on the Comet*, 1832.

which, spreading with excessive velocity in every direction, produce, according to the theory of Huygens, the effect of *light*.

81. It is by the properties of this universally diffused ether that not only *light*, but also *heat*, and probably *electricity* and *magnetism*, are supposed to exist. And the fact of there being such latent light may be shown by the following experiment. Take two pieces of smooth flint and rub them together in a dark room, and the latent light or caloric matter will be immediately produced and become visible. The existence of this caloric or primitive light may be detected in various other bodies by rubbing two hard sticks together, or by hammering cold iron, which, in a short time, becomes red hot, or by the sudden compression of atmospheric air in a tube.

82. The theory originated by La Place respecting the creation of our solar system,* which is taken for granted by Humboldt and others, is an additional proof of light existing independent of the sun. La Place conceived that "in the beginning" the whole solar system consisted of a mass of vaporous matter, having a central nucleus, and the whole rotating on its axis in one uniform direction, from west to east. Such a mass would, in condensing by cold, leave in the place of its equator zones of vapour composed of substances which require an intense degree of cold to return to a liquid or solid state. These zones must have begun by circulating round the sun in the form of concentric rings, the most volatile molecules of which must have formed the superior part, and the most condensed the inferior part. In consequence of this revolving motion our globe became flattened at the poles and bulging at the equatorial region, and, in consequence of the greatness of the centrifugal force at the equator, and the contemporaneous condensation and contraction of the nebulous mass, a free, revolving ring, like that of Saturn, detached itself at the equator. This ring not being of uniform density, and in consequence of contraction, broke in one or more places, and these fragments, in obedience to the law of gravitation, became planets, revolving from west to east round the parent mass. †

83. Thus, according to the theory of La Place, not only the earth, but all the planets, existed before the sun was in its present condition, as giving light to the earth. And as these

* Professor Challis, in his *Creation in Plan and Progress*, considers that the Sun, like the other heavenly bodies, was "created in the beginning," but was prevented from illuminating the earth during the first three Yoms, or periods, by a vast stratum of vapour (see pp. 19 et seq.).

† La Place, *Exposition du Système du Monde*, pp. 465 et seq. See "Reply" for remarks on La Place's theory.

planets are not now self-illuminating, it is supposed that the rings when detached from the original mass were dark also, and that the sun did not receive its luminous photosphere * until all the planets had been detached from it.

84. Professor Nichol, in his *Planetary System*, accounts for the primitive light in a somewhat different way from La Place's theory, adducing the auroras and other phenomena as indicating the existence of a power in the matter of our globe to emit light; and, concluding that the matter of the planets is capable of evolving the energy which we term *light*; and that the atmosphere of the sun is at present under influences favourable to the high manifestation of a power which, from the other orbs in the solar system, has not entirely departed.

85. Another instance of light, independent of the sun, is seen in the *Rhizomorpha*, a species of fungus, vegetating in dark mines, and remarkable for its phosphorescent qualities. In some of the coal-mines of Saxony it is seen in great splendour, giving them the appearance of an enchanted castle; the roofs, walls, and pillars being entirely covered with them, while the beautiful light emanating from them is perfectly dazzling to the naked eye.

86. The progress of science has, therefore, dispelled the objection that light could not exist before the sun was in its present condition. And it has done even more, for it has served to prove the accuracy of the Mosaic cosmogony, which persons unacquainted with Hebrew necessarily overlook. Moses, speaking by inspiration, uses different words to express the primitive light and the luminary which God appointed to "rule the day." For when he describes, in ver. 3, the creation of light, he employs one word אור, *aor*, † to denote the light

* Arago considered that the Sun consists, first, of a dark central sphere; second, of a vast stratum of clouds suspended at certain distances from the central body; third, of a photosphere, or luminous envelope, surrounding the cloudy stratum. Sir W. Herschel calculated that the light reflected outwards by the clouds was equal to 469 rays out of 1,000, or less than half the light of the photosphere, and that the light reflected by the opaque body of the sun beneath was only 7 rays out of every 1,000. The more recent discoveries, however, by means of the spectrum analysis have somewhat modified these views.

† The word אור signifies not only light, but fire, if the Mazorete vowel points be unnoticed, as in Isaiah xlv. 16, and Ezekiel v. 2, &c. Also in Job xxi. 26, it is used for the sun, and in Job xxxvii. 3, 11, 15, for lightning. And inasmuch as God has diffused heat through every part of nature, without which there could be neither vegetation nor animal life, we may conclude that it is heat as well as light which is intended by the original word. Besides *aor* there are four other words occasionally used in Scripture to denote the sun, and which may be rendered in their more literal sense as follows:—

itself; while, in speaking of the luminary which rules the day, at ver. 16, he calls it מאור, *maor*, i.e. "a place or instrument of light," "a light-bearer," like a lighted lamp, as science has shown it to be. Hence, as M. Marcel de Serres, Professor of Geology at Montpellier, observes, "Scripture does not say that God created the light or made it, but said, 'Let it be, and it was.'" If, then, light be not a separate and definite body, but only vibrations or undulations of ether, somehow set in motion, the sacred writer could not have expressed its appearance in words more beautiful or more agreeable to truth.

87. Assuming, then, that ver. 3 speaks of the existence of light independent of that which we receive from the sun, and which in the Mosaic cosmogony is described as acting on the earth in the fourth day, when the Almighty was preparing earth for the habitation of man, we may consider whether Scripture affords us any clue to determine the duration of that period which is here so frequently mentioned under the term "*Day*."

88. It is a remarkable fact that the Hebrew word "*yom*," which we translate by the term "day," has no less than three different meanings in the first thirty-five verses of Genesis. 1. The diurnal continuance of light, or half one revolution of the earth on its axis, is called "day" (v. 5). 2. The evening and the morning combined, constituting an entire revolution of the earth, is also called "one day" in the same verse. 3. In the fourth verse of the following chapter the same word is employed to describe *the six days' creation*, or, more correctly speaking, the whole period employed in preparing earth for the habitation of man (Genesis ii. 4). And believing this period to represent what geologists term the "Post-Tertiary," I would adduce the testimony of an acknowledged authority, who observes, irrespective of any attempt to harmonize the Mosaic cosmogony with the discoveries of science, that "at the close of the Pleistocene period the present distribution of sea and land seems to have been established; the land presenting the same surface of configuration, and the sea the same coast-line, with the exception of such modifications as have since been produced by the atmospheric, aqueous, and other causes. At the close of that period the earth also appears to have been peopled by its present flora and fauna, with the exception of some local

1. *aoor*, "light"; 2. *maor*, "light-bearer"; 3. *chamah*, "heat of the sun"; 4. *cheres*, "orb of the sun"; 5. *Shemesh*, "The Visible Sun." This last, as Gesenius notices, is the primitive word for "sun," and found under the radical letters *sm*, *sn*, *sl*, in very many languages besides the Hebrew, as in Sanscrit, German, Latin, English, &c.

removals of certain animals and the general extinction of a few species."*

89. Moreover, Scripture employs the term *yom*, or "day," to denote various other periods of undefined length. Thus, in Job xiv. 6, it expresses the period of a man's life. In Ezekiel iv. 6, it represents the solar year. By St. Peter, 2 Epistle, iii. 8, it is used for one thousand years. By Daniel, viii. 14—26, the vision of one "evening—morning," a similar term to that employed by Moses, is represented as equalling a period of two thousand three hundred days. In Zechariah xiv. 7, "the day of the Lord" is defined as "one *yom*, which shall be known to the Lord, not day nor night." All these passages, to which many more might be added, are sufficient to prove that, according to the *usus loquendi* of Scripture, the term need not necessarily be limited to a period of twenty-four hours. And, consequently, many writers before the science of geology was known, such as Josephus and Philo amongst the Jews, and amongst Christians Augustine and Theodoret in ancient times, and Whiston in modern, have advocated the opinion that the term "day" in the Mosaic cosmogony denotes a period of long duration. While those who have written at a later period—such as Cuvier, Parkinson, Hugh Miller, &c., having a knowledge of geological facts before them—are irresistibly led to a similar conclusion.

90. Immediately after it is stated in ver. 5 that God called the light *Yom*, or "Day," it is added, "And there was evening, and there was morning, one peculiar day." Moses here uses the cardinal number *one*, and not the ordinal *first*, as in the Authorized Version, and as on other occasions, which appears to show that this was a peculiar day, one *sui generis*; *dies unicus*, *prorsus singularis*, as Mauer says; or, as De Witte calls it, *ein einziger Tag*; or, as Hitzig terms it, "the only one of its kind." This appears to refute the idea that nothing but a period of twenty-four hours could be meant by the term employed by Moses.

91. Further it is to be noted, that the expression "there was evening, and there was morning," which is used to express the completion of each of the six days' work, is omitted in respect to the seventh, from which we may infer that it has not yet reached its termination. The seventh day of the Mosaic cosmogony appears to be a period of undefined length; and it is not unreasonable to infer that if we can obtain from Scripture anything like its approximate duration, we have some clue to determine the length of the other six days.

* Page's *Advanced Text-book*, p. 300.

92. We read in Genesis (ii. 2, 3) that "On the seventh *Yom* (or day) God ended His work He had made; and He rested on that seventh day, and blessed it, because that in it He had rested from all His work which He had created to make." And so in Exodus xx. 2, it is said, "In six days Jehovah prepared* heaven and earth, the sea and all that in them is, and *rested* the seventh day"; from which it is argued that our warrant for observing a weekly sabbath of twenty-four hours' duration is dependent upon God's rest from His work for a similar period. But, as Hugh Miller has observed, "I know not where we shall find grounds for the belief that that Sabbath, during which God rested, was commensurate in its duration with one of the sabbaths of short-lived man—a brief period measured by a single revolution of the earth on its axis. We have not a shadow of evidence that He resumed His work of creation on the morrow. The geologist finds no trace of post-Adamic creation; the theologian can tell us of none. God's sabbath of rest may still exist; *the work of Redemption may be the work of His Sabbath day.*" †

93. If we accept this suggestion, that the work of Redemption may be, so to speak, the work of God's rest, or Sabbath day, it may serve to explain our Lord's words, "My Father worketh hitherto, and I work" (John v. 17), as showing that when God rested from the work of Creation, He commenced the work of *Redemption*, by planning out a mode consistent with His justice, whereby man might be restored to that Divine image in which he had been originally made, but had lost when Adam fell. Thus God's sabbatic rest becomes a restoring process, a building up from the ruins of the fall, including both a Divine purpose and a Divine work, in raising man to a higher level than that on which the material creation placed him. In this work both the Father and Son are said to be engaged, the work of the one being a reflex of that of the other—a work in which the profoundest rest is not excluded by the highest activity.

94. Have we, then, any intimation afforded in Scripture of the duration of God's day of rest? I think we have. The

* It is necessary to remind the English reader that the word "made" in the Authorized Version is very far from conveying the actual meaning of Moses's teaching; as it is very naturally understood to express the same sense as "in the beginning God created the heavens and the earth." But a totally different word עָשָׂה is employed here, and which can only be adequately rendered by the English word "prepared" or "made ready," as Jehovah prepared the earth for the use of man.

† Miller's *Footprints of the Creator*, p. 307.

best chronologists amongst Jews and Gentiles, who take their stand upon the infallible Word of God, are agreed in this, that the age of man on earth, since the time of Adam, is limited to a period, speaking in round numbers, of six thousand years.* But, inasmuch as Scripture speaks also of a future millennial period of blessedness, lasting for one thousand years, which is termed in Hebrews (iv. 9) "a rest or keeping of a Sabbath by God's people," we find that Christ's kingly rule over His "possessions in the uttermost parts of the earth" (Psalm ii. 8) is then said to end. Then will come the end of this age, as St. Paul declares, "when Christ shall have delivered up the kingdom to God, even the Father . . . that God may be all in all" (1 Corinthians xv. 24, 28).

95. Scripture records in many places the creation of a new heaven and a new earth, as well as many physical changes on the surface of our present globe, which, it may be supposed, will resemble the geological changes of the past; and therefore we are warranted in assuming that God will resume His creative power at the termination of the period known as the millennium, when His rest-day will of necessity come to end, which would appear on Biblical authority to have extended through seven thousand years; and if this be a correct estimate respecting the duration of one Yom or day, on the principle of analogy we may understand the remaining six Yoms to be of the same duration.

96. If this reasoning be correct, nearly fifty thousand years must have passed away since the beginning of the post-tertiary†

* Of modern chronologers, Clinton considers the 6,000 years since the time of Adam to have expired about A.D. 1862. Usher's date would bring it up to A.D. 1996; and the current chronology of the Jews about a century later still. It is unnecessary to notice the various hypotheses which those who ignore Scripture authority, have propounded for the age of man on earth; whether it be the modest proposal of the late Baron Bunsen, who fixes it at B.C. 20,000; or the Brahmin chronology, which, according to Sir William Jones, allows him an antiquity of 4,300,000 years; or that of Professor Huxley, who in his speech at Norwich contends that "the appearance of man on the globe should be thrown back to an era immeasurably more remote than has ever yet been assigned to it by the boldest speculators!" The earliest proof of man on earth is unquestionably a tablet now in the Ashmolean Museum at Oxford, from the tomb of a priest named SHERA, containing the cartouche of the reigning sovereign King Senta, before the name of "Pharaoh" was known in Egypt, which may be approximately dated as B.C. 2,300, or three centuries before the time of Abraham. All beyond this is mere speculation.

† M. D'Orbigny, who together with M. Elie de Beaumont, has mapped out the geography of Europe during the Jurassic age with great care, asserts in his *Prodrome de Paléontologie*, that not a single species, either animal or vegetable, is common to the tertiary and the post-tertiary or human periods;

period, when God began to adapt earth for the habitation of man. But we learn from the Mosaic record that the earth did not exist in its present condition until the *third* of these Yoms,—“God called the dry land Earth, and there was evening and there was morning, a *third Yom*.” Supposing, then, seven thousand years to be the duration of each of these Yoms, including that wherein God is now said to be resting, this would give, after deducting two of these Yoms, or 14,000 years before the earth appeared in its present condition, from the forty-nine thousand years, the sum total of the whole, a period of thirty-five thousand *years* as the duration of the period, reckoning from the third Yom until the present time.

97. Many tests have been suggested by geologists in order to measure the age of the post-tertiary period, the favourite one being dependent on the time required to fill up the deltas of the largest rivers known on earth; but for various reasons such data are too uncertain to allow any dependence to be placed upon them, through the impossibility of making a correct estimate of the annual rate of these subaqueous deposits. There is one test, however, which seems to afford some grounds for arriving at something like a sounder conclusion, and that is the computed age of the falls of Niagara. Sir Charles Lyell,* after the most careful inquiries which he was enabled to make on the spot in 1841, came to the conclusion that the average of *one foot* per year was the rate at which the waterfall has been cutting through its stony bed; and he considers that it would have required 35,000 *years* for the retreat of the Falls, from the escarpment at Queenstown (a distance of seven miles) to their present site. If this be a correct estimate, we may fairly infer that we have some clue to the approximate duration of the *Yoms* or “days” mentioned in the Mosaic cosmogony.

98. With regard to the formation of man, and the teaching of the human race having sprung from one pair, as stated in the Mosaic record, my space prevents me from entering upon

and therefore, in his opinion, a break must have occurred previously to the human period, since it is through species alone that an hereditary succession is kept up. This conclusion has, however, been denied by other geologists.

* Lyell's *Principles of Geology*, vol. i. ch. x. In reference to the Falls of Niagara, which are situated between Lake Erie and Lake Ontario, the level of the former being 330 feet above the latter, Sir Charles Lyell utters a very solemn prediction concerning a future catastrophe which he considers will inevitably happen in that region of the earth. He says, “The existence of enormous seas of fresh-water, such as the North American lakes, is alone sufficient to assure us that the time will come, however distant, when a deluge will lay waste a considerable part of the American Continent!” ch. v.)

that question now, so I must content myself with adducing the testimony of an acknowledged authority, the celebrated Dr. Pritchard, who had investigated the subject as deeply, perhaps, as any man who ever lived, and whose conclusions are set forth in the following words:—"On the whole, it appears that the information deduced from this method of inquiry is as satisfactory as we could expect, and is sufficient to confirm, and, indeed, by itself to establish, the inference that the human kind contains but one species, and, therefore, by a second inference, but one race. It will, I apprehend, be allowed by those who have attentively followed the investigation of particulars, that the diversities in physical character belonging to different races present no material obstacle to the opinion that all nations sprang from *one original*, a result which plainly follows from the foregoing consideration."* To which I would add, that "one original" must have been a separate act of creation on the part of the Divine Creator, and not the outcome, in the process of development, of an ascidian tadpole, according to the favourite hypothesis of certain *savans* in the present day. †

99. In summing up a review of those heathen cosmogonies at which we have slightly glanced, rather than considered at any length, and comparing them with the Hebrew, we cannot help noticing the vast gulf between the two ‡. The only

* *Researches into the Physical History of Mankind*, by James C. Pritchard, M.D., vol. ii. p. 589. The great question between Mr. Darwin and those who oppose his views may be said to consist in this:—"Is man a separate act of Creative Power?" The Bible teaches that he is—Mr. Darwin, the contrary. It is satisfactory to know that the results of a large number of experiments made by Dr. Parker, President of the Microscopical Society, and Professor Huxley, tend to prove that man must have been a separate creation. (See *Transactions of Victoria Institute*, vol. vii. p. 282.) On the question, however, of mankind being descended "from one original," as Scripture teaches, and Dr. Pritchard considers that he has proved, Professor Huxley observes, in an article in the *Fortnightly Review*, "On the Methods and Results of Ethnology," that the idea of our descent from Adam and Eve is quite a mistake. "Five-sixths of the public," he says, "are taught this Adamitic monogenism, as if it were an established truth, and believe it. I do not; and I am not acquainted with any man of science or duly instructed person who does."

† It was a profound saying of William Humboldt that man is man only by means of speech, but that in order to invent speech he must be man already. —Lyell's *Antiquity of Man*, p. 468.

‡ Even Mr. Goodwin, with all his apparent prejudice against the Mosaic cosmogony, is obliged to admit that in the Biblical record "things are called by their right names with a certain scientific exactness widely different from the imaginative cosmogonies of the Greeks" (*Essays and Reviews*, p. 223). Justin Martyr was justified in asking, "Who can believe in the drivelling theogony of Hesiod?" (*Discourse to the Greeks*, ch. ii.). And a member of

important resemblance of any ancient cosmogony to the Mosaic record is to be found in the Persian, which may be accounted for by the probability of Zoroaster, its founder, having been brought into contact with the Jews at the court of "Darius the Mede," at the close of the Babylonish captivity; though, as we have seen, some parts of it are of such a fabulous nature as to forbid the thought of their being taken from the cosmogony revealed to Moses, who could not have written as he did, in such accordance with the discoveries of true science, without the direct inspiration of God.

100. In the brief and rapid outline sketched in Scripture relating to astronomy and geology, we are enabled to see the all-perfect harmony which must ever exist between the word and the works of God. To mention only a few instances. 1st. We have the simultaneous creation of the heavens and earth at so remote a period that it requires the known rate of the speed of light to enable us to grasp either its magnitude or its age. 2nd. The earth is represented as being balanced in the air, poised by its own weight—a somewhat different conception from that of the Hindoos, who declared it to be resting on a big snake, which is itself upheld by a gigantic tortoise; but who supports the tortoise they cannot tell. 3rd. Moses teaches that the luminary which God appointed to rule the day is only a light-holder, the truth of which astronomy confirms by showing the sun to be an opaque body, dependent for its light on a luminous atmosphere. 4th. Light is said in the Mosaic record to have existed independent of the sun, which science has proved to be the case, in place of its being, as was very naturally supposed by all nations, the sole source of light and heat. 5th. Moses teaches that there is an expanse extending from earth to the ends of the Universe in which all the heavenly bodies are placed; and recent discoveries lead to the supposition of some subtle fluid in which they all move. 6th. Man is represented as having been created after the fowls, the fishes, and beasts of the field, which the modern science of geology has at length discovered to be the case.

101. With reference to the origin of the human race, the subject of so much discussion in the present day, the more we reflect on the strange nature of man, the anomalies he presents,

this Institute very properly argued that "one proof of the inspiration of the Bible is seen in the fact that in all other cosmogonies the greatest folly and nonsense is talked; while in the Bible it is sublimely stated that in the beginning God created all things" (*Transactions*, vol. vi. 161).

the knowledge of his power to do so, and his unwillingness to attempt it, according to the fine saying of the poet,—

Video meliora proboque
Deteriora sequor—,

we ask, What philosophy, ancient or modern, has ever been able to account for all these things? But the whole subject is revealed to us in the majestic narrative of Scripture—how man was originally created in the image of God, and how he lost it through the fall. Place side by side these two statements—the theory that man is no better than a well-developed ape, and the Biblical statement that he was created after the image and likeness of his Maker; the one based on the testimony of Revelation, and the other on the mere conjecture of a speculative human being; and it will surely approve itself to the intelligent mind that on such a subject science has no evidence to offer which can be compared to the proof afforded by the Bible. It is true that the fall has darkened our reason, but it has not destroyed it. There is light enough, as Pascal has pointed out, for those whose sincere wish is to see, and darkness to confound those of an opposite aim. We encounter objections to our faith, some of which it may be difficult to answer in consequence of our ignorance, and proofs drawn from our knowledge in the opposite scale. Concerning the evidence in the Biblical record, it has been well said, “If it were greater the Gospel would cease to be a faith, if it were less the Gospel would become a superstition. If it were more there would be no probation for the heart, and if less no grappling point for the reason.” But, alas! how often is the voice of reason drowned in the cry of imaginative folly! To what absurdities will not the understanding often assent when the will has determined upon their advocacy! How little way can truth make with the intellect when there is something in its character which opposes the inclination; as it has been remarked, that Athens was but the rudiments of Paradise, and an Aristotle or a Socrates only the rubbish of Adam. Dryden, in his *Religio Laici* has forcibly expressed this idea in the following nervous lines :—

Dim as the borrow'd beams of Moon and Stars
To lonely, weary, wandering travellers,
Is reason to the soul : and as on high
Those rolling fires discover but the sky,
Not light us here ; so reason's glimmering ray
But guide* us upward to a better day.

* In the edition of Dryden's Works, 1808, now before me, it is printed *guide*, not *guides*—the former being allowable.

And as those nightly tapers disappear
 When day's bright lord ascends the hemisphere,
 So pale grows reason at religion's sight,
 So dies, and so dissolves in supernatural night.
 Some few, whose lamp shone brighter, have been led
 From cause to cause to Nature's sacred head,
 And found that one First Principle must be,
 But what, or who, that universal He ;
 Whether some soul encompassing this ball,
 Unmade, unmoved ; yet making, moving all,
 Of various atoms' interfering dance,
 Leap'd into form, the noble work of chance ;
 Or this great All was from Eternity,
 Not even the Stagyrite himself could see ;
 And Epicurus guess'd as well as he.
 As blindly groped they for a future state,
 As rashly judg'd of Providence and Fate ;
 But least of all could their endeavours find,
 What most concerned the good of human kind.

* * * * *

Thus anxious thoughts in endless circles roll
 Without a centre where to fix the soul ;
 In this wild maze their vain endeavours end,
 How can the less the greater comprehend ?
 Or finite reason reach infinity ?
For what could fathom God were more than He.

The CHAIRMAN (Rev. Preb. Currey, D.D.).—I am sure we all thank Mr. Savile for his able paper ; and it will be open for those present to offer remarks thereon, after two communications have been read.

The HONORARY SECRETARY.—The following remarks upon the paper have been sent in by Professor Birks, M.A., of Cambridge:—

“ I have read Mr. Savile's paper with much interest. The first twenty-two pages, which give a summary of heathen cosmogonies, do not call for any observation. In the other thirty pages there is much with which I agree, and a good deal from which I differ. My remarks will naturally turn chiefly on the points of difference. I agree with Mr. Savile—(1) that Gen. i. 1, refers to the original act of creation, distinct from the six days' work, which was the preparation of our planet for the abode of man ; (2) that a long, undefined period separates the beginning from the first of the six days ; (3) that Gen. i. 2, describes not the first state of the earth, but a later state, just before the six days began, and probably implies a previous convulsion, involving general, if not complete, destruction of any precedent forms of life ; (4) that this probably answers to the post-tertiary or close of the tertiary period ; (5) that each of the six days must be a period of equal or nearly equal length ; (6) that man was created last in order, and at a date, geologically, very modern and recent. The points on which I differ are these : (1) that Mr. Croll's hypothesis is either proved or provable, or probable, which explains the glaciation of the earth by a greater excentricity

of the earth's orbit, either 800,000 or 200,000 years ago; (2) that Sir W. Herschel's earlier speculations on the Milky Way and the nebulae are worthy of confidence, being half-abandoned in his own later papers, and wholly disapproved, I think, by still later observations; (3) that the words of Scripture not only admit, but require, a vast interval from the first creation, so that these speculations, if they were part of the science of astronomy, and not rather erroneous guesses, could be truly said to confirm its teaching (§ 75); (4) that a comparison of vv. 5, 14 and 16, proves that the light of the first day was wholly independent of the sun; (5) that the nebular theory lends thus a direct confirmation to the Mosaic record; (6) that *yom*, because it may sometimes be used in other senses than a natural day, may be so used in this case, where it is joined six times with a numeral, and is composed, each time, of successive periods of darkness and light; (7) that each of the six days was a period of 7,000 years; and lastly, that the world's history, from Adam till the close of a future millennium, is really the seventh day, or God's Sabbath of rest. I. Mr. Savile starts from Mr. Croll's work, published last year, which he praises as one 'of the highest order of scientific knowledge,' and says that 'a somewhat perplexing point for our geologists, naturalists, and botanists may now be accounted for by the gradual advance of science in our own times.' I think, however, that this facility in accepting the latest guess or hypothesis of scientific men as a proved conclusion of science is a delusion and a snare, and has wrought, not only temptation to the faith of Christians, but injury to the progress of science itself. In Mr. Callard's essay, 'the Geological Evidences of Man's Antiquity re-examined,' Mr. Croll's hypothesis is reviewed, and I think it is shown, very plainly, that it is quite inadequate to account for the facts it attempts to explain. How uncertain are these estimates may be shown by one extract. 'Sir Charles Lyell, in the earlier editions of his *Principles of Geology*, favoured the view of Mr. James Croll, that the ice age was 800,000 years back; he, therefore, placed man's origin near that period. But Sir John Lubbock considered 210,000 years to be a more probable time; and to this latter antiquity both Mr. Croll and Sir C. Lyell afterwards give in their adherence, and it is also adopted by Mr. Geikie in his recent work, *The Great Ice Age*; the calculations of Mr. Croll go to prove, simply, that the excentricity of the earth, about 210,000 years ago, would be ten and a half millions of miles, and, 850,000 years ago, thirteen and a-half millions. Taking the lower date, the distances of the earth from the sun would vary from 81 to 102 millions of miles, a ratio of four to five, and the ratio of incident heat, in aphelion and perihelion, would be nearly two to three. Thus the excess or defect at the extremes would be one-fifth of the mean value. The theory assumes that the northern hemisphere will be subject to the greatest cold when its winter solstice is in the aphelion. But Mr. Callard observes, I think decisively, that Mars has a greater excentricity than this ascribed formerly to the earth, and is more distant from the sun, and yet gives no sign of an ice age, and the snow cap never extends more than six degrees from the pole. Still further, it seems very doubtful whether the effect would not be both very much smaller than the theory requires, and of an opposite kind. An addition of one-fifth to the incident heat at the winter solstice would be greater than the defect of one-fifth heat at the summer solstice, because the mean incident heat is less in winter than in summer. It seems to me that while the winter cold and the summer heat would both be greater by an increased excentricity, the total heat incident on the northern hemisphere, when its winter is in the aphelion, would be increased, and not diminished. At any rate, the difference is so slight, either way, in the total amount, that it could never account for a glacial period. II. Again, Mr. Savile remarks that 'stars situated in the more remote edges

of the Milky Way require a period of 20,000 years for the transit of their light, according to the estimate of Herschel; and the splendid nebula in Orion would absorb 60,000 years for the transit of light to our system. But the elder Herschel's estimates were based on an assumption of the nearly equal size of all the stars, and their nearly even distribution, which all his own later discoveries and modern observations have completely disproved. His great discovery of binary and triple stars was the first blow to the system. The Magellanic clouds, as Sir John Herschel candidly admits, furnish a strong argument against the view that a nebulous appearance is the result of greater distance alone. Mr. Proctor's reasonings and observations seem almost to prove that all the parts of the Milky Way are in physical connection with each other, and hence that there can be no immense disparity of the distance of its various parts from the sun. Again, the nebula in Orion is said to be 60,000 years of light distant from us, or 20,000 times as remote as the bright star of the Centaur. But θ Orionis is a sextuple star, of which four components form a trapezium, and are of the 4th, 6th, 7th, and 8th magnitudes. And within this trapezium, Sir J. Herschel remarks, there is no nebula. They are also in the neighbourhood of the opening of the jaws, a part where there is a void space of large extent. Hence there must be a strong presumption that this sextuple star has been condensed from the nebulous matter, where it is now missing. In this case, the distance of the nebula would correspond to that of stars between the 4th and 8th magnitudes; or light might, perhaps, travel from it, not in 60,000, but in a time of from 20 to 30 years. At least, the high numbers quoted from Sir W. Herschel and Professor Nichols have no solid warrant. When two causes, distance and inferior size, might equally occasion inferior optical magnitude, the reasonable course, in the absence of other data, is to assign it equally to both. Thus, instead of reckoning 20,000 years for the smallest distinct stars in the Milky Way, the more reasonable reckoning would be that they are really a hundred times smaller than α Centauri, and about a hundred times further off, or their distance answering to 200 or 300 years only. I wholly disagree with the statement (§ 79) that the mention of light as created before the sun is 'one of the strongest testimonies possible to the Divine authority of the Mosaic cosmogony.' It is quite enough for believers in the inspiration of the Bible that it furnishes no argument against that authority. Mr. Savile refers to the conclusions of science that light may and does emanate from other sources. He seems to think that the sun may have existed for a time without its photosphere, and that this was added by a distinct act of creation. Now that is possible in the abstract, but wholly opposed to the general scope of modern scientific theory. The most simple and natural view is that the light of the sun depends on its immense mass and the process of central condensation. But Mr. Savile refers the beginning of the first day to the post-tertiary period, about 48,000 years ago. Now Mr. Croll's theory, which he also adopts, ascribes the glacial period to great varieties of solar heat and light, due to the excentricity of the earth's orbit 800,000, or at least 160,000 years earlier than this date. The two opinions are thus wholly irreconcilable. If the sun was not the light-giver fifty thousand years ago, the other hypothesis would be plainly excluded altogether. But even rejecting that theory, which I believe we ought to do, as quite baseless, there can be no doubt, I think, that the sun was really the source of light during the tertiary and pre-tertiary periods. If so, we are forced back to what I believe is the very consistent exposition, that the narrative is optical, that the light of verse 3 was really, but not visibly, sunlight, because sun, moon, and stars, as discs in the sky, had not yet become visible to a spectator upon earth. So the heavens and earth which are now, are contrasted with those before the Flood, which are spoken of as having perished, because they were wholly blotted out from

human view, and disappeared.* I cannot spare time to enter on two other main questions,—whether the six days are literal or figurative, and whether the world's history can be the seventh day of Moses, or God's Sabbath of rest. On both I wholly disagree with Mr. Savile, and have seen nothing to alter my conviction that the six days are literal days, and the sixth the first day of Adam's lifetime. The strength of the argument for this view does not depend on an assertion that *day* can never have a figurative or extended meaning, that would be plainly absurd to affirm; it rests on the double and triple fact, that this light-time is named *day*, just as the dry land is named earth, and the gathering of the waters is named seas, which fixes day, night, sky, earth, seas, to their usual and customary sense; that each of these days consists of an evening of darkness followed by a morning of light; and that they are joined with ordinal numbers, of which no single instance, either in Scripture or other authors, can be found in the case of figurative or metaphorical days. And besides, if all the six days follow the tertiary period, as Mr. Savile, I believe rightly, affirms; there is no gain whatever for the reconciliation of Scripture with geological science, in extending their length to seven thousand years.—With thanks to Mr. Savile for his interesting and suggestive paper, I remain, yours respectfully, T. R. BIRKS. Cambridge, Feb. 2, 1876.”

I have also received the following from Professor Challis, F.R.S., F.R.A.S., of Cambridge :—

“I have had some conversation respecting Mr. Savile's paper with Professor Birks, who agrees with me in disapproval of some of the author's views. For my own part, I never could accept Buckland's idea of interposing an interval of long duration between the first and second verses of Genesis i. Mr. Birks agreed with me in the opinion that Croll's theory of changes of the earth's temperature, resulting from changes of the eccentricity of its orbit, which Mr. Savile accepts without hesitation, is not adequate to account for the observed facts of geology. I think, too, that Mr. Savile has made too much of La Place's nebular hypothesis, which is altogether speculative, not having received, and, as far as I can see, not being capable of receiving, any such confirmation as that on which Newton's theory of gravitation rests. I have noticed an inaccuracy as to matter of fact in sec. 74. Lord Rosse's telescope showed that a great number of minute stars are scattered about the great nebula in Orion, and thus *partly* resolved it; but the spectroscope has since proved that, in addition to these stars, there is a large portion of the nebula which is strictly nebulous or gaseous matter, and therefore quite irresolvable. Do what you please with these remarks.—I am, &c., J. CHALLIS.”

The Rev. Prebendary Row.—There are some parts of Mr. Savile's paper upon which I would wish to make a few observations; and, first, as to the Jewish work, *Zohar*, I believe it is full of a greater mass of extravagance than any other book. Most certainly many other literary productions of that time are full of the wildest speculations. There is one thing which I saw in section 51 of Mr. Savile's paper which astonished me, and made

* This question was taken up by Dr. Dawson, F.R.S., who says (*Journal of Transactions*, vol. ix. p. 173): “The Bible abounds in illustrative references to natural objects and phenomena. I think it is the conclusion of all competent naturalists who have carefully studied these, that they are remarkable for their precise truth to Nature, and for the absence of all theoretical or hypothetical views.”

me question the general character of the references which the author has made, as to whether they had been fully verified: "There are those who stand midway between atheists and theists, like Professor Tyndall, and content themselves with a sort of ideal Deity of their own composition; while others, like Herbert Spencer, are unable to make up their minds as to the existence of a God or not." Now, if one thing is more certain than another, it is that Herbert Spencer maintains in his philosophy that the conception of a God as first cause is an actual necessity of thought. Such is the unquestionable opinion of Herbert Spencer. It is abundantly borne out by the cosmical philosophy of Mr. Fisk, which I have just been reading, who is a devout disciple of Herbert Spencer. When I took up this paper I had been writing, as part of my lecture for Norwich Cathedral, a comparison between John Stuart Mill and Herbert Spencer; Mill denying that the principle of causation affords any proof of the existence of a God, and Herbert Spencer distinctly affirming that a first cause to the universe is a necessity of thought. On the question of ancient philosophy the Christian Fathers are quoted, and among others Justin, as being authorities as to the tenets of the ancient Greek philosophers. Now, you cannot rely on worse authorities. Several of the Fathers were very desirous of forcing the Greek philosophers into a sort of advocacy of Christianity. If you wish to get at the real opinions of the Greek philosophers you cannot rely on guides who are more untrustworthy. We know that they were anxious to get the ancient philosophers into Egypt, in order that they might bring them into contact with the ideas in the Old Testament; but there is a very general disbelief that many of them ever visited that country. Nothing can be more doubtful than the evidence on which this rests. Again, in sec. 24, there is another reference to the authority of the Fathers. It is many years since I have read Aristotle's *Treatise on the Soul*, but I recollect his observations on it in the *Ethics*. This is what Mr. Savile gives us, in reference to the assertions of Aristotle:—"Likewise, respecting the soul, while Plato says it consists of three parts, including the faculties of reason, affection, and appetite, Aristotle declares the soul is not so comprehensive, but only includes *reason*." In the *Ethics* the contrary is most distinctly affirmed. I do not accuse the author of this paper of misrepresenting the Fathers, but I say this merely to show you that such references to them are worthless and misleading. If we wish to have the real opinions of those ancient philosophers, the proper mode would be to refer to the statements of those great authorities, or to the philosophers themselves, instead of taking those of the Fathers, which cannot be relied upon. I am aware that there is considerable doubt about the Aristotelian canon; but it has been fully discussed in several of the greatest modern works, such as of Grote, Lewis, and others. Grote has found considerable difficulty in determining it. In the time of Cicero it is clear that other works must have been attributed to Aristotle than those which we now possess, for Cicero speaks of the great pleasantness of his style, and that is certainly not its characteristic in the

works which we have at present. An eminent writer says that Aristotle's style is so dry and terse that it is more like a table of contents than anything else. There is no doubt that if you read some of the Platonic writings, for instance, the *Phædo*, you will find that there are things in them which, doubtless, are not meant to be taken seriously; fancies which are not meant to be seriously propounded as realities. Take also Mr. Savile's reference to the earlier philosophers; there is the greatest difficulty in ascertaining what their opinions were. The best writers represent them vaguely, and what we have of their works are mere fragments. We need not, therefore, wonder, when we read them, that they seem exceedingly strange. But as these men lived at the very first dawn of human thought, we ought not to expect to find anything like a very coherent theory respecting the universe. There is one philosopher, Pythagoras, who is referred to in the paper; now, nothing is more doubtful than the history of Pythagoras and the subjects of his teaching. If he is correctly reported to have discovered the forty-seventh proposition of the First Book of Euclid, he cannot be responsible for some of the excessively stupid things which have been attributed to him. Our knowledge of him, and of many of his doctrines, rests on an authority which is extremely doubtful, and which can only be accepted with the very greatest care. There cannot be a doubt that the speculations of many of the ancient philosophers were very wild and vague. This could not well be otherwise, for they had no facts to go upon. They were mere *à priori* speculations, and could not be of much assistance to us one way or the other. I wished only to point out two or three things which appeared to me to be exceedingly doubtful in Mr. Savile's paper, and among them his references, which have rather shaken my faith in the value of others in the paper which I have not been able to verify.

Mr. T. K. CALLARD.—I see from the valuable paper we have listened to this evening, that Mr. Savile regards the days of creation,—the six yoms,—as six epochs of time, and supposes each yom to be a period of 7,000 years. This appears to me to be adding a fresh difficulty to the reading of Scripture, instead of removing one. I can well understand why Hugh Miller should contend for the days being immense epochs, for he thought that by so doing he was gaining the time required by geology for the great antiquity of the globe; but then Hugh Miller supposed the days to begin with the construction of the globe, whilst the yoms of Mr. Savile only date from the post-tertiary period. Mr. Savile has already got rid of the difficulty arising out of the earth's antiquity by reading Gen. i. 2 (*Tho hu* and *Bo hu*), "without form and void," not as the chaotic condition of the primary creation, but as the desolation of the earth's surface, with the destruction of the flora and fauna, at a subsequent period, yet prior to the creation of man. I think the author is perfectly right in this rendering; for in no part of Scripture do these words occur without referring to something which has had form coming into a state of disorder,—it never refers to a chaotic condition of material that has not yet received form. If then there

has been any devastation on the earth corresponding to the description of Gen. i. 2, in recent geological times, and if the yoms date from that period, then there is plenty of time for the Palæozoic, Mesozoic, and Cainozoic eras, without making the yoms also great epochs. It appears to me that the most natural way of reading Genesis, is to think that a day means a day, and not 7,000 years. And nothing is gained by the extended time; the difficulty of time is met by the yoms commencing, as stated, in the post-tertiary period. There is no difficulty in the yoms being natural days that would be removed by making the six days 42,000 years. I would now, in support of Mr. Savile's interpretation of Gen. i. 2, ask the question, Whether physical science knows of any great devastation of the earth's surface and destruction of the flora and fauna taking place in the post-tertiary period, that would correspond with the *Tho hu* and *Bo hu* of that verse? And I would repeat the question that I put some years ago,—whether the glacial epoch was not the period of such destruction of the flora and fauna as would make the creation recorded by Moses a necessity, if life was to be continued on the globe? Mr. Savile has quoted an eminent geologist, Mr. David Page, who without any attempt to harmonize the Mosaic cosmogony with the discoveries of science, says, that at the close of the Pleistocene period “the present distribution of sea and land seems to have been established, and at the same period the earth also appears to have been peopled by its present flora and fauna.” And M. Agassiz, after exploring the valley of the Amazon, in an address given before the Cooper Institute, New York, and quoted in the *New York Tribune*, December 30th, 1873, says, “that the valley of the Amazon about the equator was filled by a vast glacier which came down from the Andes, and went into the Atlantic; the ice then, perhaps, covered the sea to such an extent that it is a question whether any open water was left at the equator, as it is a question whether there now is open water at the pole. And if this be so,” he adds, “you see at once how this intense cold must have modified the surface of the globe to the extent of excluding all life from the surface, . . . and prepared the earth for the new creation which now exists upon it.” If Agassiz is right (and modern discoveries are leading to the conclusion that the glaciation of the globe was vastly greater than was at first suspected), and if it can be made out that man's creation took place near to the time of this glacial period, it will be for us to consider whether that glaciation was not the cause of the “without form and void” of sacred Scripture. A difficulty in recognizing this will exist in the mind of Mr. Savile, arising from his having accepted for the present the theory of Mr. Croll respecting the cause of the glacial epoch, which theory, if correct, would necessarily place the glacial period at 210,000 or 850,000 years back, because astronomy teaches us that those were the periods when there occurred great excentricities of the earth's orbit. But if it should be proved, and I think it can be proved, that the excentricity of the earth's orbit, together with the precession of the equinoxes, was not the cause of the glacial epoch, then there

is no reason for putting it back to that remote period. Now if this *Ice Age* was of the character supposed by Agassiz and its effect so widely felt, and if it had passed away just before the time of man's creation, it would have left the world in the condition supposed by Mr. Savile's interpretation of the "*Tho hu* and *Bo hu*" which preceded the six yoms of creation, and would be an important and an unexpected note of harmony between geological science and Bible teaching.

Rev. J. J. COXHEAD.—It appears to me, that both in the paper and in the debate, one line of argument has been followed, which I think is scarcely fair under the circumstances. It is this, the ideas of one age have been compared with, or attributed to, those of another, when such a proceeding was not warranted. And are we not arguing on two distinct lines of thought, and is it possible to institute a fair comparison between the two? With regard to the question of fossils, and periods, and strata, and glacial epochs, when we come to compare them with the sublime declaration of the Word of God, it appears to me that we are bringing into our argument two sets of ideas which are not at all to be compared with each other. I do not suppose that Moses ever heard of the glacial epoch, or that the Egyptians, or the Jews, ever conceived the idea of fossils or geological periods. In fact, we are bringing in modern ideas and attempting to compare them with Scriptural ideas, with which they have nothing in common. The point is, whether we have a right to consider the Mosaic account of the Creation at all in the light of a cosmogony. The only cosmogony which we can consider to be scientific is that cosmogony which we are led to infer from the truths of geology; and if we are bold enough to carry our speculation further, as to the power of the nebular hypothesis, and still further as to the nature of the primordial atoms, of which you consider the universe to consist, I think we get ourselves into a range of ideas totally different from those which we obtain from the account of Moses. We shall make a great mistake, in my opinion, if we attempt in any way to compare these things with Scriptural teaching, or to make the one support the other. In six days, we are told, Creation took place, and that is confirmed by the fourth commandment. When we hear of the periods of time between the days, we find that is contradicted by the fourth commandment, which tells us distinctly in so many words that in six days the Lord made the heavens and the earth. If we want to know whether those days were periods of 7,000 or 14,000 years each, we have only to consider the words "the evening and the morning." We do not talk in that way of periods of 7,000 years. There is a simplicity about that language. It is language addressed to children, intended to impress upon our minds the idea of the omnipotence of God; and that as man works six days and rests on the seventh, so God, the great Creator, made all things, working in a fixed time, in regular method, and by rule. If we go into any speculation and attempt to apply geology to Genesis, we shall fall into a very great mistake. The object of Genesis is to teach us religion; the object of geology is to teach us the science of creation. If we go back to the question of atoms, we ask, who made the atoms? and science cannot answer that. When we fall back on

Genesis, we are told that God made the heavens and the earth, and everything else. I have been somewhat disappointed by this paper. I expected that reference would have been made to the *Timæus* of Plato, which gives us the basis of the Greek cosmogonies. Plato tells us how God made the world out of the four elements, according to fixed ideas in His mind, and formed all things by means of inferior deities whom He had created. Many of the moral and spiritual notions of Plato agree in a remarkable manner with the teachings of Scripture, but that has not been referred to in the paper before us.

Rev. J. W. BUCKLEY.—I cannot but think that the word "day" in Genesis means some longer period than that which we ordinarily understand by "day." There is no great difficulty in supposing that the word "day" means a period. We shall surely get ourselves into a very great fix as theologians, if we maintain, after the researches of science, that the days of creation are what we understand by days. I do not know whether that is what Mr. Coxhead means.

Mr. COXHEAD.—Yes; I do mean a day, from the rising to the setting of the sun.

Mr. BUCKLEY.—I should be sorry as a clergyman to be bound by that definition; and I do not believe that great theologians at any time have really held that view. I am afraid we shall set Science and Scripture hopelessly at issue, if we dogmatically adopt such an interpretation. Nor need we be perplexed, if we suppose "day" to mean a period, as to how we should then understand the institution of the Sabbath.* We should believe that the seventh period was God's period of rest, and that He set apart the seventh day in each week as man's period for rest; not, indeed, of the same absolute length, but in like proportion.

A MEMBER.—There have been several attempts to harmonize the account given by Moses with modern science, but many have been too prone to accept every statement of geology and astronomy as the expression of an unalterable truth. I think that we cannot shut out from our knowledge that both sciences have been growing. There have been divines in years gone by who have reconciled systems of geology or astronomy with Scripture; and when those systems have changed other divines have reconciled the new systems with Scripture. And so they have gone on, and there are in the present day divines who are trying to reconcile Genesis with modern science. But I would ask, are we to accept the teachings of science as final? "Scio" means "I know," but many of our so-called scientific truths are mere assumptions. Scientific men assume very many things in the present day, and have gone through a uniform process in all times. It is true that in our own day scientific assumptions are often advanced as "working theories,"

* Professor Challis has fully taken up this, as well as other points touched upon in Mr. Coxhead's speech; see vol. ix. p. 143.—Ed.

and we often find unscientific people regarding such working theories as the accepted results of scientific inquiry.

The CHAIRMAN.—A thought has occurred to me in the course of this debate which seems in accord with the remarks made by Mr. Coxhead, whether there is such a thing as a Hebrew cosmogony at all. We know that the ancient philosophers accounted for the state of the universe by suggesting some hypothesis with which it might seem to accord. We need not enter into the various strange hypotheses brought forward by the Eastern nations, although we must remember that in those hypotheses they were not so extravagant as may appear to ordinary Englishmen ; because, no doubt the expressions which they used had a symbolical meaning in them, and probably a more abstruse and philosophical sense than may at first sight appear. But while so many have thus endeavoured to devise cosmogonical theories, I do not discover such an attempt in the books of Moses, and I think we should be cautious in speaking of any cosmogony as authorized by Scripture. There are certain hints given in the Book of Genesis, but what we really get is the great fact that a personal God created all things and all persons ; all that exists in heaven and on earth ; and although that creation is narrated in a certain order, it is not, to my mind, at all necessary to suppose that Moses intended to dwell very much upon the distinct order in which those several objects were called into being. For whatever has been said with regard to the creation of light independent of the luminous body*—the sun—there is certainly great difficulty in the supposition. There is great difficulty in supposing the creation of luminiferous ether in one day, and in supposing the creation of the sun the day after, especially if there was, as some say, an enormous break in the tertiary period, and so on. But geological evidence will show that during the tertiary period and the secondary period also, a sun must have existed, for the fossils have visual organs similar to those which animals now possess, fitted, like theirs, to receive the rays of the sun ; nor can we conceive a vehicle of light (luminiferous ether) without the light which it is to convey. I read the opening chapters of Genesis as a

* " With respect to the *creation* of 'the greater light' and 'lesser light' on the *fourth* day, it is to be observed that the principle of the narrative demanded that their existence should date . . . from the time when they began to determine days, and months, and seasons, and years . . . Still, it is to be said that *scientific* reasons might be given for dating the visible existence of the luminaries from the fourth day, if physical science, inclusive of the science of geology, were in such an advanced state as to allow of determining the forces and the operations whereby successive changes in the earth, the sea, and the atmosphere were produced in the geological epochs. (I have made some attempts in this direction in pp. 40-43 of my work.) In any case, however, an argument for the truth of the Scripture cosmogony may be drawn from the creation of the sun being assigned to the fourth day after it had been said that day and night had been generated on the *first* day ; for this is just such a contradiction as a fabricator would have avoided."—Professor CHALLIS, F.R.S.

grand and sublime declaration that a Personal God created all things, and I dwell, not upon the particular order in which that creation may be related, but on the fact that God created those things.* We may, as a matter of interest and speculation, choose for ourselves something of a cosmical theory, based on what we consider to be the proper meaning of Genesis, but at the same time we should hesitate before we call a theory, however clever and ingeniously managed, a *Scriptural Cosmogony*. I do not in the least believe in a Scriptural cosmogony. If we try to construct one, a number of scientific questions will arise which it will be impossible to settle, although they may contain valuable suggestions on many points. After all, we are not to base our faith in the truth of the Scriptural narrative upon any cosmical theory. It is not upon a cosmical theory, but upon the creation of the universe by a Personal Agent that Scripture earnestly and constantly insists. With regard to the question of the days, many and diverse theories have been propounded, and one appears very probable until it is overthrown and another takes its place. Whether we have got to the right solution of the question yet I do not know, and it does not much matter. Many such a speculation is interesting, but do not let us call it Scriptural. It is man's ingenious theory, based upon certain words of Scripture, and it is as likely to be wrong as the theories of the ancient philosophers. There seems to be much truth in what Mr. Row said, as to taking the opinions of the heathen philosophers from Justin Martyr and the Fathers; and, perhaps, when Mr. Savile comes to consider the question he will be inclined to admit so much. Justin Martyr is no authority for what Plato or Aristotle said. The Fathers were not deeply versed in ancient philosophy. Certainly Justin Martyr did not comprehend either Plato or Aristotle very clearly; but I do not suppose Mr. Savile intended to lay much stress on that. What he desired was to draw out and state first certain ancient cosmical theories, and this he has done in a very interesting manner, showing how much they differed from the simplicity of Scripture. That is really the point, and whether we devise a cosmogony or not is not of very great importance. What is important is not to imagine that any theory which we draw out from the words of Scripture as we interpret them, is a Scriptural cosmogony, to which we are bound to pin our faith. We base our faith on the simple, plain account that a Personal God created the world, and the rest is matter of speculation. I am sure we must all concur in thanking Mr. Savile for his

* "In common with all the most experienced geologists of this age and nation, and in agreement with the conclusions of Conybeare and the lectures of Buckland and Sedgwick, I see in the vast geological record, not an anti-Mosaic history of the creation of man, but pre-Mosaic tables of stone, inscribed by the hand of the Divine Master, and bearing traces of His earlier works, earlier co-ordinations of the appointed powers of nature, earlier terms of the one creative series, whose latest period includes the history of man."—J. PHILLIPS, late Professor of Geology at Oxford.

very learned paper, from which many of us must have derived much information.

Mr. SAVILE.—Respecting Mr. Row's objection to my implied opinion of Aristotle, I would point out that it is not mine, but that of Justin Martyr, whose opinion of that famous philosopher is given at length, in the work to which I have referred in § 26. There are reasons why I must still prefer the opinion of Justin respecting him to that of Mr. Row ; inasmuch as he was a Grecian, and not an Englishman ; he lived seventeen centuries nearer the time of Aristotle, and was therefore more likely to understand him aright. Moreover, he was himself an eminent philosopher ; which can scarcely be said of any of the early Christian Fathers, with the exception of Clement of Alexandria in the second century. I must, therefore, still believe that Justin Martyr has correctly interpreted the opinion of Aristotle, whose philosophy, I venture to think, will not be much enhanced, when we hear of his grave and numerous errors of detail ; e.g. he affirmed that only in man we had the beating of the heart, that the left side of the body was colder than the right, that men had more teeth than women, and that there is an empty space at the back of every man's head ! (See Professor Tyndall's "Address to the British Association at Belfast in 1874," p. 15.) In reference to what is said in note to § 48, about the way in which Genesis i. 1 has been interpreted by those who in former days attempted to explain the Mosaic cosmogony without any knowledge of geology, I have recently discovered that Dr. James Anderson, in his work on the *Royal Genealogies*, considered a very learned work at the time of its publication, 150 years ago, explains the teaching of Moses in the following way :—"In the beginning of Time, God Almighty made out of nothing the Heavens and the Earth on October 23rd in the afternoon, B.C. 4004 ; and the All-wise God thought fit to perform Creation gradually in the space of six days !" As regards the quotation from Herbert Spencer referred to in § 51, I gave it on the authority of Dr. Irons, but have recently been favoured with a letter from Mr. Spencer on the subject, and am obliged to own that I think Dr. Irons's interpretation of Mr. Spencer's opinions is, to say the least, certainly "misleading," as Mr. Spencer expresses it.* And inasmuch as Mr. Herbert Spencer, in the chapter on "Reconciliation," admits "the Creative Power," though divested of all anthropomorphisms, I do not see how any one can be warranted in asserting that he thus teaches,—"I do not affirm that there is no God. I am simply between the two statements. Some say there is a God ; some say there is not. I only say that I am not aware of it." In a similar manner I cannot help thinking that Professor Tyndall has been much misunderstood ; for though it is true that he has "as little fellowship with the atheist who says there is no God, as with the theist who professes to know the mind of God" (*Use and Limit of the*

* Dr. Irons has since written to say that he considers the quotation faithfully represents Mr. H. Spencer's statements in *First Principles*.—Ed.

Imagination in Science, p. 50); and again at p. 72 of the same work, he declares that "the question, Whence come we? Whither go we? dies without an answer, without even an echo, upon the infinite shores of the Unknown"—in a work written four years later, he expresses his more mature thoughts in the following candid way:—"In connexion with the charge of atheism I would make one remark. Christian men are proved by their writings to have their hours of strength and of conviction; and men like myself share, in their own way, these variations of mood and tense. . . . But I have noticed during years of self-observation that it is not in hours of clearness and vigour that this doctrine commends itself to my mind; that in the presence of stronger and healthier thought it ever dissolves, as offering no solution of the mystery in which we dwell, and of which we form a part." (Preface to the 6th edition of the *Belfast Address*, p. viii.) With regard to the letters from Professors Birks and Challis, remarking on some portions of my paper; entertaining, as I do, the highest opinion of those two distinguished professors of my own Alma Mater, I proceed to offer the following reply. Professor Birks objects to Mr. Croll's theory, mentioned in § 72, respecting the glacial period, and the excentricity of the earth's orbit in bygone ages. Although I am quite ready to admit that it is only as yet an hypothesis, which must abide the test of time and investigation, yet I still think it the best mode of explaining the appearance of our coal-beds in high latitudes, where the flora of which they are composed could not exist with the present climate; but I do not understand, as Professor Birks does, that Mr. Croll's hypothesis respecting the glacial period being 800,000 years ago, in any way affects the supposed antiquity of man. I understand Professor Birks' objection to my assumption at § 73, to the supposed distance of the "fixed stars" from our solar system, according to the theory of Herschel and Nichol, rests upon the disputed question, both in respect to the magnitude of the fixed stars, and also the full velocity of light, which depends upon the exact distance of the sun from the earth, whose mean distance is assumed to be 91,400,000 miles, but which may be hereafter rectified by the calculations dependent upon the transit of Venus, which occurred in 1874, and will again take place in 1882. The Astronomer Royal of Scotland, however, speaks of this "merely as *one step* towards getting the sun-distance number perhaps a trifle better than before"; and he proceeds to call attention to the variations of science respecting the supposed distance of the sun in various ages of the world. Thus, of the learned Greeks, Herodotus supposed the sun to have been a mere satellite of the earth, acted upon by the same forces which are sensible to us (lib. ii. § 24), and consequently could only have been distant about ten miles. Anaxagoras computed it at about 14,000 miles. Aristarchus increased it to over 5,000,000 miles. Two thousand years later, Kepler enlarged it to over 26,000,000. Delambre, in the eighteenth century, advanced it to 96,100,000 miles. Since that time, the distance in mileage has been gradually receding, until Henderson, in 1832, reduced it to 89,586,000 miles. Since then,—“the real sun-distance, by

modern astronomy, has been held, during the last half-century, to be over 95,000,000 miles, because it had been produced by the calculations of a late first-rate German astronomer,—calculations so vast, so difficult, and with such prestige of accuracy and power about them, that no living man cared to dispute their results. One group of astronomers declared the true mean sun-distance to be about ninety-one to ninety-one and a half millions of miles; another group declared it to be ninety to ninety-two and a half millions of miles. While they were fighting together as to whose results were the better (an actual duel with swords was expected at one time between M. Leverrier and the late lamented M. de Launay), an eminent chemical engineer, when studying the mensurations of the great pyramid of Ghizeeh, came to the conclusion that 91,840,000 miles was the true measure of the sun's distance from the earth" (see *Our Inheritance in the Great Pyramid*, by Piazzi Smyth, F.R.S.E., F.R.A.S., Astronomer Royal for Scotland, pp. 49-51; also a valuable pamphlet *On the Sun's Distance and Parallax*, by St. John Vincent Day, C.E., F.R.S.S.A.). If this estimate of the sun's distance be confirmed by the calculations resting upon the transit of Venus in 1882, and the velocity of light be only slightly reduced in consequence, the effect would be, as I venture still to think, notwithstanding the able remarks of Professor Birks, to lower the distance of the nebulae in Orion from a period of 60,000 years, according to the estimate of Herschel as the time required for light to pass from Orion to our solar system, to about 50,000 years. And this would have had but slight effect upon my illustration of our distance from the fixed stars, which I used as an argument in proof that the simultaneous creation of the heavens and the earth "in the beginning," according to the Mosaic cosmogony, must have meant something far more distant in point of time, than merely 6,000 years ago, when man was first made after the image and likeness of God. I have spoken at § 83 of La Place's theory respecting creation as hypothetical, and only so as it does not appear to me to contradict what we may gather from Scripture respecting cosmogony as contained therein; but I readily bow to the superior judgment of Professor Challis respecting the nebular hypothesis, and accept his assurance that "the spectroscope has proved (since Lord Rosse's telescope was first directed to the nebulae in Orion) that, in addition to those stars, there is a large portion of the nebulae which is strictly nebulous or gaseous matter, and therefore quite irresolvable,"—merely remarking that if the nebular hypothesis, over which the scientific world has been battling so long, be confirmed or not, it in nowise affects my argument respecting the beginning of creation, according to the testimony of the Divine record. I may add that neither Sir John Herschel, in his *Astronomy*, nor Mr. Grant, in his *History of Physical Astronomy*, both standard works, makes any mention of the nebular hypothesis. In reply to another remark of Professor Challis, he misunderstands me in supposing that I advocate "Buckland's idea of interposing an interval of long duration between the first and second verses of

Genesis i." What I understand by these two verses is this,—that the former refers to that lengthened period from the beginning of creation to the end of the tertiary; and the latter to what geologists term the post-tertiary, when God finished the preparation of the earth for the habitation of man. I use the word "finished," because all the previous conditions of the earth,—the carboniferous eras, for example, were evidently designed by an All-wise Providence for the exclusive use of man; but I do not see any necessity for believing in any interval of long duration between the catastrophe which took place at the close of the tertiary, when the earth was again reduced, as it had often been before, to that state of chaos, which is expressed in Scripture by the definite terms of *tho hā* and *bo hā*. The late M. D'Orbigny, in his *Prodome de Paléontologie*, after an elaborate examination of vast multitudes of fossils, gives reasons for believing that there have been twenty-nine creations, separated from one another by catastrophes which have swept away the species existing at the time, with rare exceptions never exceeding $1\frac{1}{2}$ per cent. of the whole number discovered. And though he states that both animals and plants appeared in each of these twenty-nine periods, I am unable to see how it conflicts, as some have concluded, with my theory that the duration of the *yom* or "day" mentioned in the first chapter of Genesis cannot be limited to a period of 24 hours. If the argument referred to in § 97, as Sir Charles Lyell's conclusion respecting the correct age of the falls of Niagara must be given up,—and I think that recent intelligence of the rapid way in which the falls are decreasing tends to that conclusion, we have still the far stronger argument of *analogy* to rest upon; and if it be true chronology that man has existed on earth for a period of about 6,000 years, and has before him the promised millennial period of another 1,000 years, making 7,000 in all, previous to Christ delivering up the kingdom, as St. Paul teaches, to the Father, in order that "God may be all in all," I cannot see why Hugh Miller's conclusion should not be accepted by all believers in the Divine record; viz., that the Sabbath, during which God rested, was commensurate in duration with one of the Sabbaths of short-lived man, and that God's Sabbath of rest has continued ever since His creation of a being after His own image,—while, in consequence of the Fall, the work of redemption may be understood as in some sense the most blessed work of His Sabbath Day.

The Meeting was then adjourned.