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The Rev. J. H. TITCOMB was unable to read his Paper, on account of a severe accident, but stated that a friend, the Rev. J. B. Heard, had kindly consented to do so for him.

The following Paper was then read :—

ON CERTAIN MAGNITUDES IN NATURE, AND THEIR BEARINGS UPON BIBLICAL INTERPRETATION. By the Rev. J. H. TITCOMB,* M.A.

THERE is a text in the 111th Psalm, which, though it stands in immediate connection with the doctrine of Divine Providence, is none the less applicable to the doctrine of Creation. "The Works of the Lord are great,"—says the Psalmist—"sought out of all them that have pleasure therein!" † What a golden link between science and revelation! It seems to sound like a voice from the realms of universal nature, bidding us search into the laws which govern them, take pleasure in the phenomena which they present to us, and measure the power of their Creator by the magnitude of the forces which regulate them. Thus science, when reverently pursued, becomes the handmaid of true religion; their spheres of thought being separate, yet equally culminating in the praise and glory of God.

2. Such, at all events, is the platform upon which we stand in the meetings of this Institute. Searching into the various mysteries of nature, we do so under a solemn conviction that we are therein studying the works of a Heavenly Father; and that, in all those works, whatever department we may investigate, we are beholding proofs of the Divine goodness and greatness. Whether our investigations lead us into researches among the animal or vegetable kingdoms, or whether into the physical and inorganic, they alike conduct us, as Christian philosophers, toward the contemplation of Infinite wisdom and truth. Whether we are tempted to inquiries respecting things that are minute and microscopic, or to inquiries about any of those forces in nature which bring us face to face with velocities and periods that are overwhelming in the character of their magnitude, the pleasure and the profit are the same. On the present occasion it will be our function to examine some of the latter class of phenomena. In doing which, we shall place the recorded facts of science in the light of holy Scripture; simply

* Now Canon Titcomb. † Ps. cxi. 2.

for the purpose of ascertaining, if we can, how far they affect the principles of Biblical interpretation.

3. It appears to me that it is impossible to overrate the importance of this inquiry. It is one of the greatest and most anxious questions of the day. For so long as Christian philosophers are unable to see how holy Scripture may be a true revelation of God's mind to man, and yet be altogether independent of the researches of science, it is certain that scientific men will have a tendency to regard revelation with distaste, and even look upon its authority with suspicion. If they find themselves unable to pursue their researches from a strictly scientific point of view, without having their opinions called in question as infidel, because they seem to be in conflict with Scripture, they will necessarily come to the conclusion that either one or other of these two bases of belief must be abandoned. It is perfectly clear that they will not abandon the first; and therefore nothing will remain for them but to give up the second. Thus the means we use to protect the authority of Divine revelation may become a latent source of unbelief, and spread the very evil we deplore. I am speaking to you plainly because the danger is imminent; indeed the mischief is already working widely. Nor is it possible for a member of this Institute, whose sole object it is to preserve a proper relationship between science and revelation, to do better service than by showing how each of these may be studied, and received independently, without any want of due allegiance to either.

4. In prosecuting this purpose perhaps I cannot do better than state, at the outset, the conviction which I have arrived at after long and anxious study; and which I now desire to put forth for discussion, with all the anxiety of one who seeks alone after truth. It is this: That while Scripture is indifferent to the duty of expressing itself with uniform exactness upon scientific questions, it is nevertheless so perfectly accurate in some particulars which have been only made known by recent scientific discoveries, as to justify us in believing that, wherever it fails to be properly scientific, it does not result from any inability to be so, but simply from the circumstance that its primary and fundamental object was of a different nature; the scientific propriety of its language having been deliberately set aside, in order that its teaching might be subordinated to those moral and spiritual purposes which were the great ends for which revelation was delivered.

5. It appears to me that this view of the subject is not only capable of proof, but that it is the only view by which we can be loyal to our Bibles, and yet loyal to Science also. To establish this proposition will be the object of the present paper.

6. The line of my argument must be threefold:—1. I shall concede that Scripture is indifferent about speaking upon scientific facts with philosophical accuracy; 2. I shall show that some of its expressions are, notwithstanding, so scientifically accurate, as to be consistent with the latest of our modern discoveries; 3. I shall then test the bearing of these facts upon Biblical interpretation, and ultimately come to the conclusion just announced.

I.—WE SHALL CONCEDE THAT SCRIPTURE DOES NOT INVARIABLY EXPRESS ITSELF WITH EXACTNESS ON SCIENTIFIC QUESTIONS.

7. Since, for all the purposes of controversy, one test is as good as twenty, let us confine ourselves to the Creation of the world; which in the fourth Commandment is said to have been effected in six days. "For in six days the Lord made heaven and earth, the sea, and all that in them is, and rested the seventh day; wherefore the Lord blessed the seventh day and hallowed it." (Ex. xx. 11.) Now, comparing this statement with the account given us in the first chapter of Genesis, it is perfectly clear that it speaks of the creation of the whole physical universe, including the sun, the moon, and the stars; for, in the course of the narrative of the six days' creation, it is said that "God made two great lights, the greater light to rule the day, and the lesser light to rule the night; the stars also" (v. 16).^{*} Reading all this, therefore, in the way of plain common sense, and taking the words in their simple and natural meaning, it is absolutely impossible to doubt that the Hebrews to whom they were revealed regarded them as teaching that the whole universe, from the stars above their heads to the waters at the bottom of the sea, were created in six days; and that, as God rested from His work on the seventh, that day was to be observed by them

* I am not going to enter into the question as to whether the first verse of this chapter describes an *original creation* of the universe at an indefinite point of remote time; while the rest of the chapter, in which the six days' work is recorded, refers only to the *present condition* of the earth's surface; because that theory is now held to be impossible by all scientific men. It was held by Buckland, but has been abandoned by Hugh Miller and all the later geologists.

as a weekly rest. It may be perfectly right for modern criticism to contend that the days here spoken of are capable of being interpreted as "extended epochs of untold duration." Yet we are bound to allow, in all honesty, that this was not its natural or primitive teaching. The very fact that the seventh day's rest was a day of natural duration could not but have carried with it a conviction that all the other days were of a like character, and that thus the whole work of Creation, from beginning to end, was the product of six days' wisdom and skill on the part of the Heavenly Architect. In other words, the language of Scripture in this particular makes no pretensions to be scientifically accurate.

8. The truth of this need scarcely be examined at any length in a Society like ours. We will, however, make a few brief remarks upon it in connection with some of those magnitudes of time and space, which are now disclosed to us by the researches of geology and astronomy. Let us begin with the former.

9. Of the enormous epochs which must have been necessary to produce the various phenomena of the earth's crust, no man who has seriously studied the subject can entertain a doubt. Easy-going indifference may toss the thought aside; but only ignorance can deny it. Ever since Mr. W. Smith first pointed out that there was a regular order in the deposition of sedimentary rocks, each of the divisions being marked by distinct organic remains representing many successive races of plants and animals which have been buried by the aqueous changes of our globe, and during which changes thousands of species and genera have become extinct, so that the flora and fauna now living are but a small part of those which once lived in the past; ever since that moment our conviction has become more and more clear that the time required for the gradual formation of such rocks must have been vast beyond all measurement. As observations have increased, and fresh records of fact have accumulated, showing the deposition of many rocks perfectly separate in composition, and varying from the Laurentian (which in Canada are 30,000 feet thick) to the Tertiary (which are, upon the whole, 9,000 feet in thickness), this conviction has become so strong as to be irresistible. Some of these rocks are entirely made up of the remains of zoophytes and testacea, the concretion of which cannot but have been gradual. How can we see millions of shells dispersed through a long series of strata without allowing time for the multiplication of successive generations? How can we contemplate certain deposits, such as those which are composed of *Diatomaceæ* (take the *Tripoli* rock in Bohemia, for example, where the microscope

shows that 41,000 millions of fossil specimens of the *Gaillonella distans* are contained in a single cubic inch), without recognizing in such strata a perpetuation of countless generations? Who, again, can take into review the vast superpositions of different strata on the same spot, indicating successive alternations of fresh-water deposits and deep-sea bottoms, subsidences and elevations, dislocations and denudations, arctic climates and tropical, with buried remains of the most divergent forms of flora and fauna, and not be convinced that all this must of necessity represent the gradual accretion of successive ages? To say nothing of the old Cambrian and Silurian strata, almost devoid of organic life, the Old Red Sandstone, with its marvellous fossils, occupying a thickness in some places of 10,000 feet, the Carboniferous Coal-measures, which in South Wales are to be found 12,000 feet thick; the Magnesian Limestones of the Permian period, the lower formation of which alone are 3,000 feet in some parts of the north-west of England; the New Red Sandstone, again; and then the Oolitic beds, which in the Isle of Portland underlie a fresh-water deposit, that, too, underlying a layer of old forest tree-stumps, and that once more underlying a bed of fresh-water calcareous slate;—to say nothing of all these revolutions of the earth's surface;—who can study the fresh-water Clays of the Wealden in Sussex, Kent, and Surrey, succeeded by those deep-sea deposits of gault, greensand, and chalk which surround, and in part overlie them; and these, again, followed by the Lower Eocene beds of the London Clay, containing tropical plants, shells, and animals; and these once more by further deposits distinctly evidencing a period of glacial action, and all ending in the tertiary crust above;—who, I say, can contemplate changes and revolutions like these, during which species of flora and fauna have lived and flourished in all sorts of varieties, each race displacing the other, without having an overwhelming sense both of the forces of nature, and of the enormous periods of time which must have been necessary to produce such accumulated results?

10. The same conviction that extended cycles of ages must have passed away since the heavens and the earth were first created, is no less forced upon our attention by the discoveries of astronomy. I particularly refer to those immense periods which the passage of light can be demonstrated to require before it can reach the eye of an observer on the earth when it comes from stars situated in the Milky Way, or from the still more distant nebulae.

11. So long, of course, as the distances of the fixed stars were unknown, it was utterly impossible to ascertain the length of time which their light would need in order to reach the

earth. This problem surpassed the loftiest efforts of the human mind for many centuries. It was, comparatively speaking, easy to measure the distance of the moon and the nearer planets, and even the sun; inasmuch as by simultaneous observation of any one of the bodies from two different points on the surface of the earth, and from the consequent diurnal parallax, its distance was easily ascertainable by a simple formula. But with the fixed stars this course was impracticable; inasmuch as the space between any two points on the surface of the globe is absolutely insignificant when compared with the tremendous depth of space which separates the earth from even the nearest of such stars. It was found, indeed, that when any fixed star was observed from one given spot, at intervals of six months, giving, as a base-line, the intermediate passage of the globe in its annual orbit round the sun (*i.e.* about 190,000,000 miles), the most powerful telescope could detect no parallax. This circumstance was formerly made use of by astronomers, in order to throw ridicule upon the discovery of Copernicus. They argued that it was impossible the earth could be making an annual circuit of nearly 400,000,000 miles round the sun; because, if so, the fixed stars must of course appear in different positions at different periods of the year. In vain did the advocates of the Copernican system reply, that this was caused by the prodigious distances of the fixed stars, which made the orbit of the earth itself, vast as it is, a mere speck in comparison. In their ignorance of that fact, many of the old philosophers still refused to believe. Since then, however, by means of improved telescopes, and the clever researches of such men as Henderson, Bessel, and others, the annual parallax of certain fixed stars has been discovered; and, as a consequence, their actual distance from the earth.

12. This discovery ranks among the most notable of those which belong to the domain of modern science, and has greatly added to the sublimity of our astronomical knowledge. It was between the years 1838-40 that Professor Bessel, of Königsberg obtained the most unequivocal results in this matter. I say unequivocal, because all astronomers concur in regarding his calculations as correct. The parallax which Bessel determined was that of the double star 61 Cygni, amounting only to $0.348''$, or to very little more than a third of a second of space; from which it was soon calculated that the distance of this star from our earth must be such that light (which is known to travel at the rate of 192,000 miles per second) must take $9\frac{1}{2}$ years to pass from it to us.

13. It may serve to give some idea of the immense distances of the main mass of the fixed stars when we say that only nine

of them can be said to have any distinct and ascertainable parallax; the rest being too remote for positive calculation by any such means. Of these nine, α Centauri is the nearest, being about 22 billions of miles distant; Sirius, a little under 90 billions of miles; and Arcturus, 160 billions, the light from which latter must therefore require twenty-six years to reach the earth. To Bessel, Henderson, and Peters belong the honour of these most important discoveries.

14. Such results, however, are as nothing when compared with the still more splendid discoveries of the two Herschels in relation to the Milky Way—that magnificent galaxy of stars which spreads across the heavens like a broad zone of light, and is familiar to the commonest observers. Submitting this mighty range of stars to his great reflecting telescope, which had an aperture of 18 inches with a focal length of 20 feet, and a magnifying power of 180, Sir W. Herschel found that the distances of many of these stars from the earth must be 750 times greater than the distance of an average star of the first magnitude such as α Centauri. As, therefore, this latter star requires $3\frac{1}{2}$ years to send us its light, it follows that the light from the Milky Way requires more than 2,656 years to reach us. Through the researches of the same great astronomer we learn also that the number of stars in this stupendous creation is from twenty to thirty millions; and that its entire length extends to about 60,000 billions of miles. This being so, the time which light takes to pass from one extremity to the other must be nearly 10,000 years.

15. But we have not done yet. For under the scrutiny of our most powerful telescopes a variety of nebulæ have been discovered, about 5,000 in number,—being systems of other stars still more remote than those in the Milky Way,—some of them being from 7,000 to 8,000 times the distance of our nearest fixed stars. Consequently, about 30,000 years must at least have elapsed since their creation, otherwise a sight of them would never have reached the eyes of our telescopic observers. Nor, is this all. For, to use the words of Professor Birks, “If the distance of these nebulous systems from each other, compared with their own magnitude, bears any resemblance to the distance which separates each planetary system from the nearest fixed stars, it is not unlikely that the intervals of many of the nebulæ are 1,000 times greater than the utmost extent of the Milky Way, or not less than 60 trillions of miles. Such a remoteness is really inconceivable,” he adds, “since light itself, in traversing it, would occupy almost 10 millions of years.”

16. From all this, then, it becomes very obvious that, by a

careful correlation of the science of Geology with that of Astronomy, their discoveries mutually confirm one another; leading us, by the magnitude of their results, to one inevitable conclusion, viz., that the creation of the physical universe was not the work of six natural days, which took place about 6,000 years ago, but of a period which is now lost in years, that must be reckoned by millions. Hence we are bound, as honest inquirers, to concede that Scripture, in its account of creation, although it may really be capable of an interpretation which is not inconsistent with scientific thought,—was nevertheless primarily couched in language which paid no respect to philosophical exactness.

II.—WE HAVE TO SHOW THAT, NOTWITHSTANDING THIS, SOME OF THE STATEMENTS OF SCRIPTURE ARE SO EXACTLY SCIENTIFIC, AS TO BE PERFECTLY CONSISTENT EVEN WITH THE LATEST MODERN DISCOVERIES.

17. Let me only call your attention to three things: the first in connection with Geology; the next with Physiology; and the third with Astronomy.

18. If there be one thing more clearly established by the modern science of Geology than another, it is this:—that the origination of animal life has been progressive. It matters not, for my present purpose, whether the student believes in the theory of evolution, or of separate creational constructions, everything goes to prove that there was a gradual course of development in this department of organic existence which, commencing with the simple forms, ended with man as the highest. All the fossiliferous rocks bear testimony to this. We begin with the *Foraminifera*, even as low as the earliest Laurentian. The Cambrian and Silurian introduce us to mollusks, corals, and starfish. As soon as we ascend to the Lower Ludlow rocks, we find ourselves, for the first time, in the presence of a *Vertebrated* order of fishes, which increase in number and perfection as we pass upwards through the Old Red Sandstone deposits. By-and-by we reach a new order, viz. the *Batrachian*, *Labyrinthodont*, and *Saurian reptiles*, amphibious air-breathing creatures, which are found in the coal-measures. In the Lower Trias of the United States we first meet with the footprints of *birds*. In the Triassic beds of North-western Germany we also find, for the first time, evidence of a small *Mammifer*, probably insectivorous. By the time, however, that

we have arrived at the Stonesfield slate of the Oolitic period, we come upon mammals belonging to four different species, and three distinct genera; while, in the Purbeck beds of the same period, mammalian life appears to have been much more general, for, in one place, the remains of as many as eight or nine genera, belonging to fourteen different species, have been discovered within an area of 500 yards square, all of the *Marsupial* order. We now reach the Tertiary and Post-Tertiary periods, where the order of mammals ranges through every form, until we come to elephants, tigers, stags, &c., which are only varieties of the corresponding species of our present times.

19. Now throughout this long course of progressive development in structural organization Geology discloses no appearance of Man until the last period which I have named. It is perfectly true that a higher antiquity is assigned to Man by many geologists than we have hitherto been in the habit of allowing, inasmuch as human remains have been found in gravel-beds and bone-caves alongside of extinct animals. But that much-mooted question bears in no way upon my present purpose. What I am now observing is, that Man stands out at the end of this long chain of progressive organization; and is therein proclaimed by Geology as its highest masterpiece. Whether he has been upon the earth 6,000 years or 60,000, the records of the rocks can produce no evidence of his existence until all other forms of mammalian life had been previously perfected; nor can it show any other typical form of organization which has succeeded him. This is one of the last revelations of natural science.

20. Such being the case, then, I ask you to notice how exactly Scripture agrees with this code of scientific belief. The narrative of the creation of the universe in six natural days may be as unscientific as you please. The lines of divergence by which their respective narratives travel may be as wide as you like to call them; but when we come to the close of each, you observe they meet at exactly the same point. Man is the great heading-up of the work of creation, the crown and masterpiece of the whole, beyond which no record can be found. In this respect, therefore, Divine revelation and the revelations of natural science are absolutely and precisely identical.

21. Let us now look at one or two facts in connection with Physiology. I refer to the correlation of birds and fishes, and to their marked separation in certain particulars from the organization of beasts. In the first place, birds and fishes are alike oviparous; while beasts are viviparous. In the next place, the methods of locomotion, both in birds and fishes, are analogous; the flight of the first being produced by the movement

of wings in the air, that of the second by a corresponding movement of fins in the water; whereas mammalia are completely destitute of either. We do not mean to say that it needed any discoveries of modern science to point out this amount of correlation and distinction between these orders of creation. I mention them only as introducing another fact which has recently been ascertained, and which throws much additional light upon the subject. The late Dr. Prevost, a celebrated anatomist of Geneva, some years ago startled the scientific world by the results of his experiments upon the blood of birds and fishes, as compared with the blood of mammals; by which he showed, beyond all doubt, that the globules of blood in the two former were identical, whereas the globules of blood in the latter were perfectly distinct. And again, Professor Huxley, in some of his communications to the Geological Society, has adduced certain curious evidences of affinity between birds and the Dinosaurian reptiles.

22. Now, putting these facts together, I call your attention to the very remarkable manner in which they coincide with the teaching of Scripture, in Gen. i. 20, compared with v. 24. In the first of these verses we have a picture drawn of the vivification of the waters, out of which there arises a twofold order of aquatic and aerial creations. "And God said, let the *waters* bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven." From which language, even if we had no science, we might reasonably infer that fishes and birds were correlated both as to origin and physiology. Afterwards, speaking of a separate and distinct department of creational construction, we have the following words:—"And God said, let the *earth* bring forth the living creature after his kind, cattle and creeping thing, and beast of the earth, after his kind." Thus the language of this passage is so far the language of natural philosophy; inasmuch as it traces a physiological distinction between the origin of mammals and those of birds and fishes. True, it is not couched in scientific phraseology, nevertheless its teaching is perfectly coincident with science, even when science is traced up to its latest discoveries.

23. Let us now pass to some of the last and most interesting revelations of modern astronomy. Here, however, instead of using my own words, I prefer quoting from a valuable little work which has lately been published by a Cambridge mathematician.* He is speaking of the question as to whether the

* *The Romance of Astronomy*, by R. K. Miller; to which the author of this paper is indebted for one or two thoughts on § 11.

stars are really fixed, as their popular name supposes; or whether they, like all the minor bodies, have their own special orbits and revolutions. He says:—

“The fact that some of these stars had a distinct and separate motion, indicating a permanent change of their position relatively to the sun, was first discovered by Edmund Halley. Some observations of the three brilliant stars, Sirius, Arcturus, and Aldebaran, made by the old Egyptian astronomers, had fortunately been handed down to his time; and, on looking over them, he perceived that those stars must have shifted their positions since that early time, by a small but well-marked amount. This indicated that either these stars, or the sun, or probably both, must have changed their places by many millions of miles since those old records had been penned by the philosophers of Alexandria. Other astronomers followed in Halley’s track; and, by the beginning of this century, the proper motion of more than a hundred stars had been determined, chiefly by comparing them with Tycho Brahe’s catalogue, made out two hundred years before. These proper motions showed great differences in amount and direction; and no attempt was made to reconcile and systematize them until the subject was taken up by the bold and speculative genius of Sir William Herschel, who revelled in difficulties, and whose daring and ambitious spirit always selected the loftiest and apparently most hopeless themes. He succeeded in evoking order out of apparent confusion and chaos; and announced his discovery of the fact that the sun, with all his gorgeous following, is sweeping majestically through space in the direction of the constellation Hercules. It was not till fifty years afterwards that another astronomer was found bold enough to grapple with this mighty theme. It was then taken up by some of the leading astronomers of Russia, with the advantage of half a century’s additional observations, and Herschel’s results were confirmed in the fullest manner possible.

“Of course the other suns of our great cluster have their own motions also; their varying position relatively to ourselves depending partly upon our motion, and partly on their own. Mathematical theory, proceeding upon Newton’s great law, tells us that the *centre of this universal motion* must be the centre of gravity of the whole stellar cluster; that any star situated there must be at rest, while all the others are circling in ceaseless revolution around it. Mädler, of Dorpat, is the only astronomer who has ventured to seek for this central sun. By studying Herschel’s diagram of the stellar system, and combining it with the known direction of our sun’s motion, this philosopher was led to believe that the centre of gravity of that system must be

situated in or near the constellation Taurus. A careful examination of all the stars in that quarter of the heavens made him finally fix upon Alcyone, *the central orb of the Pleiades*, as being the object of his search."

24. Now, while I must frankly admit that this final conclusion is at present somewhat uncertain, yet I bring it before you as one of the latest and grandest deductions of astronomical science, and as one which identifies itself with a hitherto obscure and unexplained passage of Scripture, in a manner that is eminently striking. If you turn to Job xxxviii. 31, you will find the following words:—"Canst thou bind the sweet influences of *Pleiades*?"* What are these sweet influences? For about three or four thousand years this question has remained in Scripture without any intelligible meaning. It has been supposed to have reference to some old belief in the influence of this constellation on the weather, or to certain old astrological beliefs of some sort. But now the ambiguity may be clearing; and the calm, quiet power of these magnificent influences may be beginning to be really understood. If so, is it not marvellous to find how it has awaited the successive discoveries of our most gifted astronomers thus unintentionally to interpret it? And is it not an evidence that while, beyond all contradiction, some parts of Divine revelation are unscientific in their phraseology, others are in the highest degree accurate and philosophical?

25. This brings me to my third point,—viz. :—

III.—TO TEST THE BEARING OF THESE VARIOUS FACTS UPON THE QUESTION OF BIBLICAL INTERPRETATION.

26. If the preceding portions of my paper be correct, we have seen :—

1st. *That the language of the Bible is sometimes utterly indifferent to the duty of expressing itself with exactness upon scientific themes.* The question which every theologian has to determine is, why was this so? It is sometimes argued that, if holy Scripture be a *bonâ fide* revelation from God, it must necessarily be as correct in its scientific phraseology as it is in its theological, because an Omniscient and Infallible Mind could never have allowed one word to go forth in His name which

* In the Hebrew *Chimah*. That it denotes the Pleiades is agreed; being the least doubtful of the determinations of the Septuagint. See article "Pleiades" in Smith's "Dictionary of the Bible."

was not absolutely true. This sounds very plausible. Yet may it not be one of those human preconceptions by which we may unnecessarily hamper our judgments? For what if God was pleased, in the early education of His church, to deal with it as a teacher does with children; stating facts immaturely and imperfectly, because the whole truth was at the time unsuited to its comprehension? Would there be anything in this unsuited to the infallibility of the Divine Mind? Nay, is it not obviously the case in reference to some points which cannot be controverted; such as the anthropomorphic representations of Deity? Can it be said that the picture of a living personal God, having human members, is *absolutely true*? What we contend for, therefore, is that this case should not be predetermined without investigation. Accepting, as we do, the inspiration of holy Scripture upon grounds which are totally distinct from any of those raised in this discussion, all we maintain is, that theologians should not come to it, having their minds occupied with self-willed preconceptions; but be ready rather, with the humility of little children, to adapt their preconceptions, when necessary, to the inexorable logic of facts. We begin, therefore, by facing this bold assertion that the Word of God must be as necessarily exact in all its scientific as in all its moral and religious language. I ask is this an intuitive preconception based upon some self-evidential truth; or is it a misconception founded upon the self-assumed authority of our own reason? Surely it must be the latter. For what antecedent obligation exists, previously to our making any inquiry into the case, by which we are compelled to regard the language of Scripture upon questions which have a scientific bearing as infallibly accurate? Do you say, because it was inspired by the infallible Spirit? That fact I hold to as tenaciously as any others. But it by no means settles the point. For, as I have said before, it seems perfectly consistent to suppose that the Spirit of God should have inspired the sacred writers with the utterance of infallible teaching upon all those purposes for which Revelation was designed—viz., moral and religious purposes,—and yet have allowed their inspiration to use terms of speech on points which formed no part of the designs of Revelation, such as scientific questions, according to the manner in which those persons to whom the Revelation was delivered could at the time best understand them. The very fact that this distinction presents itself to the minds of reverent believers in God's word as something which is both possible and probable, proves that, at any rate, the opposite conception cannot be necessarily intuitive and obligatory. When that view is forced upon us, therefore, previously to any examination of Scripture language, we

assign it to the self-assumed authority of reason which proudly prejudges the case ; and not, as its advocates suppose, to the exercise of a humble and reverential faith. If faith be really humble, it will take the Word of God as it finds it, and be ready to give up the preconceptions of reason ; it will interpret the writing of Scripture, not as it expects the writing to speak, but as it does speak ; it will use reason, not to prejudice its teaching, but to interpret it ; and on questions which are non-essential to its fundamental purpose, and where its phraseology is inconsistent with the unmistakable facts of science, it will not be shocked or shaken, but calmly conclude that God knew best what He was doing, and had some good reason for permitting the incongruity.

27. What, then, is the bearing of these remarks upon Biblical interpretation? Simply this: That as the Bible was not intended to teach science, the inspiration of its language upon questions involving science was subordinated to the single purpose of making moral and religious truth intelligible. Instead of complicating that teaching, by addressing itself to its readers in language which could not have been well understood, it adopted the phraseology which was best suited to the times, and which served in the most direct and forcible manner to enforce its spiritual lessons. Take the Mosaic account of the Creation, for example. The great purpose of this narrative (which Moses probably wrote as the *resumé* of a grand panoramic vision) was evidently to lay down a basis for the institution of the Sabbath. It pleased God, that is to say, to appoint for man the sanctification of one day's rest in seven, as a means by which his physical and moral welfare might be perpetually subserved. Hence He gave a sketch of His creative works in the form of six separated periods—periods described phenomenally just as they appeared in the vision to Moses as natural days, or as intervals between six evenings and mornings—periods which, whether they were prolonged ages or not, God allowed to be portrayed under the figure of ordinary days, in order that the moral significance of the seventh day's rest might be the more simple and obvious. In other words, the science of the divine cosmogony was subordinated to its great spiritual and religious purposes. Under these circumstances, that Moses should have described what he saw in his vision in the ordinary language of days, and that he should have restated it more decisively in the fourth commandment, constitutes no argument against his having received a *true* revelation. He expressed himself merely as the vision appeared to his own self-consciousness ; whereas, in reality, it may have properly represented six great eras of ages. As

it was not necessary, however, to make the message of God to man strictly scientific, he was permitted to speak popularly rather than philosophically, for a grand moral purpose. In the same way, when scientific men object to the statement of God's having rested from His work on the seventh day, because certain processes of creation are still going forward in the deposition of deep-sea chalk-beds, and in a variety of other methods (a fact, by the way, which is confirmed by our Blessed Lord in that remarkable passage, "My Father worketh hitherto, and I work"); it is enough for us to reply, that Moses made this statement only as a result of the vision which had been granted to him. Beholding a cessation of the various phenomenal changes which had been brought before his eye, he simply described what he had seen, and registered it accordingly; the strictly scientific truth of the case being thus subordinated to its merely phenomenal appearance for the sake of a moral and religious purpose. In like manner, when Joshua commanded the sun to stand still, whatever may have been the nature of the miracle, it was at any rate a mysterious prolongation of daylight; and therefore language was used to denote it which, though strictly speaking unscientific, was, nevertheless, best suited to serve the moral purpose which God had in view, viz., to impress upon the Hebrews His almighty power over nature, and its exercise in defence of His covenant people. In this way both the writing of Moses and the utterance of Joshua may justly be regarded as inspired; notwithstanding that the forms into which their language was thrown are now found to be at variance with scientific accuracy.* I venture to submit that there is neither irreverence nor unbelief of God's word in this form of Biblical interpretation. More than that, I am persuaded it is the only ground upon which the Bible can continue to be received by men of science, or stand against the attacks of scientific infidelity.

28. The man of pure science, however, upon hearing this view of Biblical interpretation, may very fairly turn round and ask us by what right we thus speak of the inspiration of the Bible as consciously subordinating science to higher moral purposes? He may say to us: "This is only your own invention, in order to get rid of a difficulty. The Bible is unscientific in its phraseology involuntarily. Any idea of yours that the Mind which inspired it knew better, and only held

* Other illustrations might be given from the second chapter of Genesis which is still less scientific in its narration, under the same line of argument but, for the sake of simplicity, I forbear to enter upon them; one sample being quite sufficient.

back the real facts of science by a premeditated purpose, is purely imaginary and unwarrantable." Such a rejoinder, I say, may reasonably be expected; and in the absence of any evidence to the contrary, might be perfectly legitimate.

29. We meet it, therefore, now by the second conclusion at which we have arrived in the preceding portion of this paper—viz., *That notwithstanding the unscientific language of some portions of Scripture, there are other parts so exactly scientific as to be consistent even with the latest discoveries of modern philosophy.* We have adduced, you will remark, three evidences of this, and had there been time, we might have adduced more; and we have proved that the Mind which inspired Scripture must have been cognisant of them. Hence we have perfectly logical and rational grounds for believing that the same source of inspiration might have expressed truth much more scientifically in other places if it had been pleased to do so. We see in this circumstance a deliberate reservation of scientific knowledge, which, if it had been the will of God to disclose to us in His revelation, He might easily have done. And, therefore, we lawfully conclude that He withheld it by some deliberate purpose. In other words, that Scripture *consciously* subordinated science to certain moral and religious purposes; which purposes it would have complicated and rendered less perspicuous, at the time when first delivered, if it had been propounded.

30. I consequently sum up the whole argument in the words with which I commenced. I say, if Scripture be unscientific in any part of its language it does not result from its inability to speak otherwise, but simply from the circumstance that its primary and fundamental object was moral and religious teaching. Hence the believer in Divine revelation need not be in the least degree perplexed or confounded; his position is impregnable and immovable. As he does not go to philosophy for his religion, so neither does he go to Scripture for his science. He does homage to both with true loyalty of feeling in their respective spheres, and uses each with thankfulness in the two great departments of truth which they are intended to illustrate. He does not say to the scientific philosopher, "You are an infidel because your views are not coincident with the Bible," neither does he say to his Bible, "Thou art false, O book, because thy voice is not always philosophical." He sees a reason on both sides for the divergence which at once satisfies his conscience and gratifies his intellect, and he pursues his studies accordingly.

31. This is, in my judgment, the true harmony between science and Scripture; and I am satisfied it is the only one which will stand the scrutiny of severe investigation. If

we go beyond this, by attempting to make every word in Scripture tally with scientific facts, we shall not only fail, but weaken the evidences of Revelation instead of strengthening them. In our vain attempt to uphold it by insecure props we shall bring it down with a crash. We shall alienate the scientific world from Christianity, and drive it more and more into antagonism with us. In which case the Victoria Institute, instead of being a foster-mother to religion, will become unconsciously one of its worst and deadliest foes. On the contrary, by treating this important question in the manner which I have ventured here to adopt, we shall sustain our character honourably, both as students of science, and as believers in the Word of God. For observe, I pray you, that while we have approached this Holy Word with an implicit conviction that all its teaching is divine, I have not attempted to force its teaching into any preconceived and self-determined lines of our own making, but have taken it just as it stands, and have interpreted it according to those necessary laws of sequence, which ever attend the discovery of actual facts. Now, I submit that this is at once reverential and philosophical, and alone worthy of an Institute like our own, which professes to reason without unbelief, and to believe without being unreasonable. It seems to me that this is the only method by which Philosophy and Theology can occupy the same chair. Philosophy can surely never cramp her researches into physical science by any antecedent desire to force her discoveries into harmony with the words of Scripture. She says, "I must patiently investigate, tabulate results, reason on them, generalize, and draw deductions accordingly." Theology must do the same thing. She must never cramp her researches into Scripture with any preconceived determination of forcing the sacred text into harmony with science. She, too, must say, "I will patiently investigate, reverently criticise, tabulate results, generalize, and draw deductions accordingly." If students on both sides would only be thus sincerely faithful to their respective functions, and, instead of rashly making war with one another, because they appear at first sight to disagree, would only do their best to get honestly at facts, and, out of those facts, the plain teaching which they present, we might then entertain some hope that, in the calm and quiet atmosphere of ascertained and admitted truths, a way would be found for reconciling their discrepancies, without compromise on either side, and with equal loyalty to both their spheres of thought. This alone can be the foundation of their mutual respect and toleration. As, therefore, it is the singular happiness of our Institute to occupy each of these platforms, I some time ago

determined upon writing and reading a paper before its members, based upon this great principle; and I trust the result may prove that I have not laboured in vain.

The CHAIRMAN.—I am sure we ought to express our best thanks to Mr. Titcomb for his able paper. I will now call upon the Honorary Secretary to read some communications which have been received from those unable to be present to-night.

Captain F. PETRIE.—The first point, taken up in the letters I have received, is referred to in the 23rd section of the paper. Mr. Christie, the chief assistant at Greenwich, writes :*—

“Royal Observatory, Greenwich, Jan. 2, 1874.

“Sir,—In the absence of the Astronomer Royal, I beg to inform you that the evidence of the Spectroscope, as far as it goes, seems to confirm the supposed motion of the Solar System towards Hercules, but the inquiry is altogether one of a most delicate nature. There is nothing whatever to show that Alcyone is actually ‘the centre of the Cosmos,’ all that can be stated is, that it appears probable that the centre of motion of the Solar System is *somewhere* in the *direction* of Alcyone.

“I am, Sir, your obedient Servant,
“Captain F. Petrie.” “W. H. M. CHRISTIE.”

I have also a letter from the Radcliffe Observer at Oxford, who says :—

“Dear Sir,—I think that the Astronomical facts in the paper are given accurately and clearly; but I think that the concession, in the first proposition, is dangerous without a good deal more definition and explanation.

“I am, &c.
“ROBERT MAIN.”

I may add that Professor Pritchard has sent a letter of similar import.†

* I have since received the following letter, dated 15th January, 1874, from the Astronomer Royal, Sir G. B. Airy :—“In regard to Mädler’s idea of the central function of the brightest star of the Pleiades, I do not think that there is any evidence for it: and that, I believe, is the opinion of astronomers in general. There is considerable (although not certain) evidence of the motion of our system in a definite direction, but I do not see any evidence of the revolving motion of it, or of any other stars distinctly round Alcyone or any other star.”—ED.

† The Rev. Canon Birks, Professor of Moral Philosophy at Cambridge, writes to say that he can neither go with the author of the paper in the concession he makes in the first proposition (referring to the scientific inaccuracy of the Bible), nor in his attempted compensation resting on special correspondence between certain texts in the Bible and some modern scientific hypotheses; he also adds :—“The remark borrowed from me in section 15 is taken, I believe, from ‘Modern Astronomy,’ written for the Tract Society about thirty years ago. I was led soon after to ex-

J. E. HOWARD, Esq., F.R.S.—I know that there are many here better able than myself to speak upon the paper just read, but I think we shall all feel that Mr. Titcomb has not at all over-estimated the magnitude of the subject which he has brought before us. For myself, I would suggest that we exercise the greatest possible caution in the way in which we handle the subject; we must all be well aware, that in connection with those last-mentioned six days of creation, there are a number of opinions which are strongly entertained by many. I presume that we are not all agreed upon the interpretation which we should give to this particular portion of Scripture, and the very eloquent, able, and interesting paper which we have heard must not be taken, I judge, as the collective opinion of the members of the Victoria Institute. I wish to say a few words upon the

amine closely that subject of which it speaks,—the distance of the nebulae, —and came to a clear conviction that both Herschel, in his earlier speculations, from whom the view is borrowed, and Struve, in his later and kindred theory, were guilty of a great and fundamental oversight, which rebutted all their conclusions. The phenomena of the Magellanic clouds seemed to me to point decisively in an opposite direction. And on general grounds of logic and sound reason, when less apparent size may result equally from two causes, real inferiority and greater distance, and we have no direct test to decide between them, the natural course is to refer it equally to both; so that a star, giving sixteen times less light, shall be naturally assumed to have half the radius, and twice the distance of another. Again, that days in Gen. i. mean days, and not long, indefinite periods, seems to me a hundred times clearer than that Gen. i. 20 implies any special likeness in the blood globules of birds and fishes, when compared with mammals, or that the 'sweet influence of the Pleiades,' in Job, has any secret reference to Mädler's unproved, and I think improbable guess, that he has detected in Alcyone the true centre of gravity of the whole cosmic system. It seems to me quite plain that Orion, the Pleiades, and Arcturus, are there named in connection with the changes of the earth's seasons, as indicated by the rising and setting of particular groups of stars, and can thus have no possible reference to such an abstract speculation in sidereal and physical astronomy. The view which I adopted with regard to the nebulae nearly thirty years ago, is the same in substance as that which Mr. Proctor has lately maintained with so much ability."

The following letter has also been received from the Rev. A. I. McCaul, lecturer in Hebrew at King's College:—

"Mr. Titcomb's paper does not satisfy me. In § 26, he says of true faith, that 'it will interpret the writing of Scripture, not as it expects the writing to speak, but as it does speak.' A most excellent maxim, which has not been followed (I think) in the note to section 7. 'I am not going to enter into the question whether the first verse of this chapter describes an original creation . . . because that theory is now held to be impossible by all scientific men.' In other words, the theories of scientific men lead us to expect the opening verses of Genesis to have this particular meaning, and therefore we will not stop to enter into the question whether the Hebrew original admits of this meaning or not. The English version, by its italics, is sufficient, or ought to be sufficient, to warn the ordinary reader of the 2nd verse, that there is something peculiar in the wording of it. I need scarcely remind you that the logical copula is, as a rule, omitted in Hebrew,

“strictly scientific” aspect of the question. The expression which Mr. Titcomb gives us in the third paragraph of his paper is, “if they find themselves unable to pursue their researches from a strictly scientific point of view”; I should judge that “strictly scientific” means, taking all pains, by every possible means, to ascertain the truth on any definite subject. The questions of the Creation, and the six periods of the creation of the world, are, of course, questions of fact, to be investigated like all other facts, taking into account every possible means of arriving at the truth; and I should consider the person who altogether overlooked or rejected the testimony of Scripture, as not viewing the thing from a “strictly scientific” point of view at all. I consider that a person with a really scientific mind, not having that mind prejudiced and previously led away, would take into

as so often in Greek, *e.g.*, *καλὸς ὁ ἄνθρωπος*, the man *is*, or *was*. In lo, ‘darkness *was* upon the face of the waters’; ‘God saw the light that it *was* good’ (verse 4), the italics indicate the absence of the copula in Hebrew. But in the words, ‘And the earth *was* without form,’ the absence of italics shows that there is a word in the Hebrew in this case for ‘*was*’; and so there *is*, and it ought to have been translated ‘had become,’ *ἐγένετο*. ‘And the earth had become without form and void.’ In my own mind there is no doubt whatever that this is the meaning of the Hebrew words. But if so, surely it affects the preceding verse, and *necessitates* an interval of time being interposed between the action of the first and second verses. But if the Hebrew has this meaning, I do not feel disposed to relinquish it because Hugh Miller and later geologists have abandoned a theory which appears to be in harmony with it. It is not my business as a Biblical interpreter, or as a Hebrew scholar, to make the Hebrew say what it does not say, out of compliment to any scientific theory, however highly it may be thought of. Science does not appear to me to be sufficiently in harmony with itself to be in a position, or anything like in a position, to lift up its voice against the Scripture statements of facts. The position held formerly by geologists with reference to the period of time necessary for the formation of strata, has (I believe) been relinquished, and they now say that perhaps hundreds of years would be enough for what formerly they said required thousands of years. I am, therefore, undisturbed by what are called ‘scientific facts,’ for I retain a doubt whether they will, some few years hence, be any longer recognized as facts. Science is not in a position to dogmatize, or, at any rate, to assail the position of the Scriptures with its dogmata. The Samaritans had their Pentateuch more than six hundred years before Christ, and almost ever since they have been in antagonism with the Jews. We may be sure, therefore, that it was no newly invented volume, which they learned to venerate. It was a law, concerning the origin of which, and concerning the antiquity of which, there was no doubt. The statements of this venerable record are not lightly to be set aside for so-called scientific theories which grow up like the mushrooms. I have also to draw attention to the fact that again, in section 22, Mr. Titcomb falls into a snare from which the italics of the English version might have delivered him, ‘fowl *that* may fly.’ There is no relative pronoun in the original, but two *co-ordinate* clauses. ‘Let the waters bring forth abundantly,’ &c., and ‘let fowl fly,’ &c.”

account, even from a *neutral* standpoint, the testimony of so ancient, and in every sense, so remarkable a document as the first chapter of the Book of Genesis: he would then, I judge, confer with all those who have examined that document, to see exactly what it does say. That is one of the first things involved in a strictly scientific investigation. He would have to get at the basis and groundwork of everything, and the discussion as to what the document is, whence it proceeds, how it was given, and what exactly it does state, enters not only into a theological, but into what I should call a "strictly scientific" view of the subject. I do not think that we have in Mr. Titcomb's paper, able as it is, materials for this; for I consider that he has not gone to the foundation of a "strictly scientific" view of the whole matter. Mr. Titcomb gives us, for instance, the view that Moses received all this account of creation in visions, and represented those visions to us. Now, we do not anywhere in Scripture (that I am aware of) learn this. We do not, in the first place, know that this information was first given to Moses. There are certain indications in the style, and language, and manner of the Book of Genesis, as all those who have studied it very well know, which lead one to suppose that it might be the incorporation of the previous knowledge handed down from the very first beginning of the family of man, and in a certain line preserved, and then incorporated into the Book of Genesis. I have not the Scriptures with me, or I could easily point out that which probably is known to many here;—"These are the generations of the heavens and of the earth," as co-related with "these are the generations of Noah," and "these are generations of the sons of Noah," and so forth; also in one place, "this is the book of the generations of Adam." Then, of course, it is a very old observation that the first chapter and two or three verses of the second chapter are called by some critics the "Elohim" document, while the next portion is called the "Jehovah Elohim" document. There must surely be allowed to be a very great difference of opinion upon a subject which we admit is one of great difficulty, and which will probably so remain; for as yet the conclusions of science are fluctuating, and by no means certain. Our own views are undergoing changes, and, ten years hence, the subject may be looked upon in a very different light from what it is this evening. I have no doubt whatever in supposing that Mr. Titcomb is right in thinking that very extensive periods were occupied in the work of creation, but I desire that we should rather subordinate all these questions to that which I regard as the truly scientific way, of beginning at the beginning;—if we cannot tell how the Revelation was communicated to Moses, to admit that fact, and to let the document speak for itself. It seems to me that the Scriptures, as the first of Genesis, come before us very much as nature comes before us. We are brought into this world, and find that it is a world full of difficulties. If we have power to master those difficulties we attain good results, but no one can deeply think upon or contemplate the creation or nature, without seeing that it presents very great and in some cases insoluble difficulties. Any one who has studied the Scriptures will

see many great difficulties, of which this is only one specimen, and the way to benefit from these is, with a humble, reverential, and child-like mind, to study and prayerfully to seek for the explanation of these difficulties. With these observations, and hoping I have not detained you too long, I should like to conclude by urging upon you great caution in treating and handling the subject, because it is, as we all know, a favourite ground with sceptics. Looking at it in their own way—that is to say from the antagonistic point of view—the document is not to be lightly set aside. In whatever way they regard the record, if they suppose there is no revelation in it, still the difficulty arises that such extraordinary agreements do occur with the deepest researches of science. Mr. Titcomb has given us some intimation of them, but they might be very much extended. One remarkable work, which has appeared lately, referring to the creation of light, points out how wonderfully consistent it is with all we can know or imagine of the operations of the Divine Being and of the researches of science. Nothing can be more illustrative of what has been said than the work of M. Pouton on the “Beginning.” Looking at it from another direction, a person who says the days must mean periods of twenty-four hours, has to explain how it is that any person capable of writing such a wonderful chapter should begin by describing days before the sun is created—days consisting of evening and morning and daylight, before the sun exists. What is meant by the evening-morning if we are compelled to take it as an ordinary day? What is the commencement of the first day beginning in the *evening* or *sunset*? And then, again, when does the seventh day terminate? All these are questions which, in whatever way this portion of Scripture is looked at, present difficulties, and we cannot approach them with too reverential a spirit, nor can we extend too much toleration to those whose views are different from our own.

REV. G. CURREY, D.D.—Mr. Titcomb has evidently introduced the *days* of the creation by way of illustration, and I trust that we shall not lose sight of the main purpose of the paper, by entering into a discussion upon the creative days of Genesis, which would give us considerable trouble, and would scarcely help us to determine the question which Mr. Titcomb has raised. The nature of the days of creation, and the manner in which they have been regarded, give indeed an apt illustration of the first proposition which Mr. Titcomb lays down, namely, that a great part of Scripture contains descriptions of natural phenomena, which are not in accordance with modern scientific research. Professor Challis has said, in one of his works, that no language of Scripture is unscientific; I suppose what he means is, that it is not contrary to science. But it is certainly unscientific in another sense; that is to say, describes things as they appear to the outward senses, not as science shows them to be. When, therefore, we say that the language of Scripture is *unscientific*, we mean that it describes natural objects as they appear, and does not touch upon the reason of their appearances. Scripture does not, therefore, contradict Science, but simply describes that of which Science endeavours to give an account. The second point is the one which I should like to have discussed: whether we can dis-

cover in Scripture intimations, not understood at the time, but now seen to be intimations, of certain scientific truths which have been made known in modern days, but were not known at the time at which the Scriptures were written, and which could not have been known by mere human knowledge. Such intimations, if they exist, must prove the books to have been written under the guidance of one possessing more than mere human knowledge. This is, I believe, the substance of the second proposition.

Mr. TITCOMB.—Quite so.

Dr. CURREY.—This is a point of great interest. It struck me at first that Scripture was a little too much treated as one book. "It knows more than it expresses." Of course Mr. Titcomb is quite as well aware as I am, of the variety of the books of Scripture. I suppose he meant, that throughout the books of Scripture, though written by a variety of authors, the unity of the Divine mind is made manifest by indications of superior knowledge—knowledge of results which have since been obtained by scientific research. It would by no means follow that the writer himself understood the full significance of the language which he employed, but being guided by One possessing perfect knowledge, he used expressions which, as discoveries have gone on in the ordinary way, are seen to be specially suitable and appropriate. Thus truth which science has reached by laborious and continued research, may have been implied in scriptural words, the fitness of which could only be thoroughly apprehended after the discoveries were made. Such a view is naturally very attractive, and I wish that I could be more thoroughly convinced of its correctness than I am at present. I cannot but think many of these supposed anticipations of scientific discovery are owing to the ingenuity of reasoners who, having the facts before them, are able to find in a few words of Scripture a kind of fore-shadowing of some scientific truth, which may after all be due simply to this, that the *appearance* necessarily gives some indications of the *cause* of the appearance. On the other hand more recondite truths, such as the motion of the whole planetary system round one point, are at best, so faintly indicated that we may well doubt whether the supposed indication is not a mere fancy of him who has produced it. I must confess that the instance often given, and brought forward by Mr. Titcomb, of the "sweet influence of the Pleiades," and "the bands of Orion," presents itself to my mind as one of such fanciful interpretation. I know that ingenious men have often discovered in human compositions, allusions which were not in the mind of the writer. There is a well-known instance of this in a paper of the *Spectator*, in which two lovers are represented as communicating with each other at a distance, by a process which has been likened to the electric telegraph, of which some have called it an anticipation. But there is no trace of the method or principle of the electric telegraph in this paper of the *Spectator*; so that when in after-days a person compares the two, he simply applies knowledge now acquired to the realization of a common idea, that of rapid intercommunication between persons at a distance, and calls the one an *anticipation* of the other. There have been many instances of this kind

of analogy,—I mention this case by way of illustration. One must therefore be cautious in reference to this second proposition ; to establish it will require more investigation, and more facts to be brought together, than we have now before us. Mr. Titcomb will at once reply, and very justly, that in a short paper like this, he rather intended to suggest, than to establish the truth. But though I have frequently seen such suggestions, I have not yet seen the assertion supported with sufficient force to bring conviction to my mind, and I do not myself see why we should, *à priori*, expect to find in Scripture traces of scientific accuracy. We know for what purpose God has been pleased to reveal His will to man ; how He has employed certain writers, to whom He gave power to make known the great principles of moral and spiritual truth ; to show beforehand, as far as He was pleased to reveal, those things which were to come to pass. All these ends were certainly quite independent of any accurate scientific investigation or statements of scientific law. Therefore I must fairly say that I should not have, *à priori*, expected that God, for the purposes which His revelation was intended to serve, would have thrown into the revelation such hints of definite scientific laws ; and if, after grave consideration and inquiry, it were to be found necessary to admit, that the suggestion of these hints was due to the ingenuity of human conjecture, and was not borne out by more exhaustive investigations, it need not shake in the slightest degree our belief in the Divine authority of the Scriptures. We should be very careful, in statements of this kind, to guard against making the truth of Scripture seem to *depend* upon the establishment of an hypothesis. If there be in Scripture real hints of scientific discovery it is an interesting fact, but it is by no means necessary to make them out. Revelation would be no less Divine, as regards its authority and origin, if this second proposition of Mr. Titcomb were incapable of being maintained. We must all be much obliged to Mr. Titcomb for the paper which has just been read. A great deal of what is stated in it is especially valuable at this time, in order to guard us against that unscientific mode of treating Scripture, according to which men sometimes endeavour to force it to speak a language which it never pretends to speak. For it must never be forgotten, that the purpose of Scripture is not to teach science, nor to lay down scientific laws, and that when it treats and describes phenomena in the form in which they appear to the senses, it does all that can be intended in relation to the great ends of creation. All this is well expressed in the present paper. There cannot be too much put forward in the present day to prevent misapprehension on the part of persons who, after studying the Bible without Science, are shocked when Science throws a new light upon some object which they have been accustomed to regard from a different point of view ; and, also to correct the misapprehensions of scientific men, who fancy that those who are maintaining the authority of the Scriptures are maintaining and insisting upon adherence to exploded errors which no thoughtful student of Scripture ought to or need maintain. The paper of Mr. Titcomb is in this way very valuable, but his

second proposition seems to me to require more proof before it can be considered to have been established.

Rev. S. WAINWRIGHT, D.D.—I quite agree with Dr. Currey's opening observation in reference to avoiding mere side issues, and concentrating our remarks upon the obvious drift of the paper. With respect to the point, one of great importance raised by him, Mr. Titcomb, in his paper, shows us what his mind is in regard to it, and he makes quite as much of the second point as of the other; his second point is, "we have to show that, notwithstanding this, some of the statements of Scripture are so exactly scientific, as to be perfectly consistent even with the latest modern discoveries." Mr. Howard said with perfect justice that this second head should have been very largely elaborated. No person, I take it, is more conscious of that than Mr. Titcomb himself, but he could not elaborate every point, and give the necessary measure to each. With respect to this particular subject Dr. Currey says he should like to see more, but he added, and rightly, that it was impossible for Mr. Titcomb to say everything within the compass of a single paper. Perhaps Dr. Currey will allow me to say in reference to that remark of his, that the difficulty I am painfully labouring under in making these remarks is, that I cannot compress all I wish to say in the compass of a five or ten minutes' address. Dr. Currey says he is of opinion that rather too much has been made of some matters, and he went on to notice, justly enough, that the Bible is treated as one book, although it is written by different men. Unless I am much in error, Mr. Titcomb himself, in a work he has recently written, draws attention to this very head. Now the point I wish to arrive at through these preliminary remarks is this. There is a more or less real or seeming correspondence between Scripture and science, and this Dr. Currey suggests, whatever its measure or extent, may be the result of the reasoner or the student placing a meaning upon words which was not in the mind of the writer when they were written. Dr. Currey does not charge anybody with *malice prepense*, nor does he say what amount of inspiring spirit would be necessary to enable a student or reasoner to find out this correspondence. Now I think it is demonstrable, by evidence of the most satisfactory kind, that, on the contrary, the inspiring spirit did intend that the student of the Bible, ready to look at these matters from a scientific point of view, and taking the character and construction of the book as one of the facts that have to be accounted for, should find that there is a science in the Bible, which is not to be got rid of except by a determination to ignore it. Is it simply that there are such hints as Dr. Currey spoke of? Is it not true that, in addition to such hints, you have express assertions upon scientific topics, uttered and actually recorded in an age when it would have been as great a miracle as any the biblical writers now claim credit for, if man, in the age in which these statements were recorded, had of himself suggested that there were such things. I do not propose now to give instances, but reference has been made so expressly to the first of Genesis, that perhaps I may be allowed to turn to that. How can you

put aside the divine inspiration which intends to tell you something which, I venture to say, on the face of it, obviously does not convey a moral or religious truth, when you are told that there was light before the sun? How could you prepare yourself to expect of a writer who knew nothing more than appeared on the surface, that he would have told you that he was putting into his narrative something that would discredit it in the estimation of the persons for whom he wrote it? I do not know whether they understood the full significance of it, but if I am to accept the facts of inspiration, I answer that these holy men spoke not of their own will, but as impelled by a divine afflatus. Then I think that covers the whole ground. I should like to state in a few words what was written by Dr. Candlish ten years ago, in the preface to a new edition of his "Reason and Revelation"; he says, "The truth I take to be this—the inspiring mind had to convey to man a revelation of moral and religious truth; He had in this connection to give a certain amount of scientific knowledge. The problem to be solved was, how the language in which the revelation to be conveyed should be so constructed and so adjusted, as to convey to the men of each successive age no higher scientific knowledge than they were in possession of, and yet should be found, in the long run, to be abreast of the highest scientific results." Dr. Candlish goes on to say that in his belief and judgment that problem had been solved. After a close and minute study of this subject, I believe this is substantially a true statement of what has been done. If a man says, it would have been more satisfactory had the scientific knowledge of the Bible been more evidently in advance of the age; I ask, in advance of what age? If in advance of every age but the coming and final age, it would have been hopelessly unintelligible to all that preceded that age. If in advance of any particular age, it would have been similarly a hopeless enigma to all who lived before it, and would have been discarded as contemptible by all who came after it. The problem was simply this,—as Professor Challis and Dr. Candlish have stated it,—to convey the truth in language which, while popular in its mode of expression, should not utter any one statement, as a matter of fact, that was not strictly true. Some persons say the Bible was not given us to teach science, but they are hardly warranted in saying what the Bible was intended to teach, unless they are in possession of the views of the inspiring spirit. We, on the other hand, are warranted in saying that the Bible was intended to teach moral and religious truths, even when embodied in statements affecting scientific knowledge. "As in Adam all die; even so in Christ shall all be made alive." Again, "God hath made of one blood all nations." In these as in many other instances the moral and spiritual truth is absolutely dependent on the scientific truth: showing that what God has joined together, you will have great difficulty in putting asunder. With respect to the language of the Scriptures and its popular character, if it is asked of us, why it is that the Bible is not strictly accurate in scientific terms? we have a right to answer, that the first scientific men of our age, before they cast a stone at Biblical language, should see that that which they themselves use is correct. In such a book as the Bible, it

was imperative that the language should be that of popular phraseology. Professor Birks says with justice that it is not Newton who complains of the statement that the sun was risen upon the earth when Lot entered into Zoar. What would you have? You must accept such a statement in popular phraseology, and I maintain that it is not unscientific because it is given in popular language. There is, however, one remark in this paper, which, notwithstanding my great reluctance to differ from Mr. Titcomb, I am obliged to dissent from. I find that I have put no less than three notes of interrogation to a single section of his paper. It is § 27, and the notes refer to what Mr. Titcomb says in regard to the "vision" of Moses, which, to say the least of it, seems to me somewhat visionary. I certainly do not see my way out of the difficulty in that direction, and as far as the general argument is concerned, I agree with Dr. McCaul and Professor Birks in rejecting the visionary idea. Mr. Titcomb says, "In the same way when scientific men object to the statement of God's having rested from His work on the seventh day, because certain processes of creation are still going forward in the deposition of deep chalk-beds, and in a variety of other methods; it is enough for us to reply, that Moses made this statement only as a result of the vision which had been granted to him. Beholding a cessation of the various phenomenal changes which had been brought before his eye, he simply described what he had seen, and registered it accordingly; the strictly scientific truth of the case being thus subordinated to its merely phenomenal appearance, for the sake of a moral and religious purpose." Now after what I have said, the meeting may not be prepared to hear me add, that I dissent from this statement, because I have told you that I justify the language of phenomena; but I must say that instead of writing the passage as it appears here, I should have written just the contrary. Without taking up any other points in the paper, I may state generally that I find that the language of the Bible exhibits a marvellous instance of scientific accuracy; for instance: the Hebrew writer says that God, as God, "hath set the earth upon nothing." Again, we read, "Only be sure that thou eat not the blood; for the blood is the life; and thou mayest not eat the life with the flesh." In these passages the writer could not have come nearer to the fact, if he had been acquainted with all the minuteness of modern science. In uninspired cosmogonies you find the writers talking of God having balanced the earth with mountains on each side in order to keep it steady. Suppose that the Bible, in any single line, had done this, or had subscribed to the astrological doctrines of the Jews, the Greeks, and the Latins, its scientific accuracy might with justice be disputed; but now we have a right to point out how marvellously the finger of God has kept the inspired writers of the Scriptures to statements which have commanded the adhesion of such minds as those of Chalmers, Sedgwick, and Whewell. These are men who knew all the discoveries of modern science, and yet they accepted the Bible as we have it. Then, I contend, these are more than hints; they are direct affirmations of the scientific truth of the Bible. Surely the existence of these scientific allusions in records so old, when the

truth could not possibly have been ascertained, does warrant us in saying that this is the finger of God. And in connection with the existence of these positive affirmations of truth there are remarkable evidences of error on the part of students of science. Scientific men are, in these days, constantly abandoning their own theories, and until you get finality in science, you have no right to question the scientific accuracy of the Bible.

Captain F. PETRIE.—As science has made such rapid strides even since the days of Chalmers, Sedgwick, and Whewell, perhaps it may be well to supplement Dr. Wainwright's remark in reference to their acceptance of the Bible, by quoting the opinions of two among the leading men of the present day in the scientific world, namely, the Rev. Robert Main (*Radcliffe Observer*), and Professor Phillips* (Professor of Geology at Oxford). The former, alluding to the Creation as given in Gen. i. 2, 3, says, "Nothing can exceed in truth and grandeur these words of the inspired historian. Like the bold touches of a great artist, they create a picture which no after-addition or refinement can improve. The only passage besides these which concerns me as an astronomer, is that which describes with equal majesty the works of the Creator beyond the earth" (Gen. i. 14—18). "The most keen-eyed hypercriticism should see nothing to object to, as unworthy of an inspired pen, in this grand assertion of God's creation of the sun, and moon, and stars, and of the provision which He made by them for the necessities of His creatures." Professor Phillips in his statement, speaking of his work as a geologist, says—"There has never been produced in my own mind . . . the slightest impression that we" (he, and those who studied under him) "were considering facts and laws in any way opposed to Christian Faith, to the inferences from Natural Theology, or the deductions from Scripture."†

The CHAIRMAN.—There is only one observation I should like to make before Mr. Titcomb replies, and it has reference to Alcyone being the centre of the entire *Cosmos*. As a scientific society, I am glad we are not allowing it to go forth that we implicitly accept Mädler's hypothesis, when we know it to be altogether ignored by many astronomers of eminence. Mädler has assumed from certain observations, that the star Alcyone is the centre of the *Cosmos*—the centre around which the whole universe revolves. Mr. Titcomb speaks of its being somewhat uncertain, but that phrase is not sufficiently strong, seeing that it is altogether disputed by many astronomers of eminence. As to the meaning of the passage in Job, "Canst thou bind the sweet influences of Pleiades or loose the bands of Orion?" it is suggested that that refers to the heliacal rising of the constellation, at the time of the year when it took place, and would be within the comprehension of the people for whom it was written. But as to its being the *omphalos* of the *Cosmos*—the centre of the whole universe,—that must have been beyond their knowledge, and the fact itself is very questionable.

* Professor Phillips died after the date of this meeting.—ED.

† "Replies to Essays and Reviews" (Parker, 1862).

Dr. IRONS.—Mr. Titcomb has given two chief illustrations of anticipations of the concurrence of Science with Scripture. Now I think we should be careful before we assume this, because however interesting the speculation may appear, I think the two points are hardly clear enough for us to rely upon.

The CHAIRMAN.—I do not wish to impugn the other point, for which there appears to be much more reason—that is, the intimate relation that exists between the tribe of birds and that of fishes, and their simultaneous creation as mentioned in Holy Scripture. Some time ago Professor Huxley at the Royal Institution, gave a lecture in which he descanted with much unction on the assumed palæontological fact of a feathered reptile: he brought forward these fossil remains as the “missing link” between the tribes of *aves* and *pisces*—birds and fishes,—and some weight appeared to be attached to it in reference to the Darwinian theory of development.

Rev. J. H. TITCOMB.—In reference to what has fallen from the last two speakers, I gather that out of the three illustrations which I brought forward in confirmation of my second point, it is only the last which is disputed. I was prepared for this. Dr. Currey, to whom I am indebted for the manner in which he brought the discussion into its proper bearings, remarked that he would have liked to have had the second division in my paper greatly strengthened; and Dr. Wainwright and Mr. Howard said that it might be: I am fully conscious that this is the case; and that the absence of other illustrations seems to give a weakness to the argument which it does not properly possess. Indeed, I had jotted down some points originally for that purpose; but, as they did not seem to me to bear especially upon the Magnitudes of Creation, I forbore to introduce them. As to many of the observations of those who have taken this paper to pieces, I can only say that they justify rather than confute me; and satisfy me more than ever of the extreme unwisdom of forming any kind of preconceived opinions as to what Scripture ought to say upon scientific questions. I believe this unphilosophical method of treating the words of Inspiration is at the root any conflict between Religion and Science. I can never yield to any man in my love and veneration for God's Holy Word; but that is a totally different question as to whether, in that blessed book, we are bound to expect invariable scientific accuracy in all its revelations to man. I will only reiterate my conviction that, if this Society is to be of any real service in defending Divine Revelation, and if it is to have any influence upon those men of science who are now disposed to criticise and laugh at Scripture, we must be prepared to stand upon the ground which I have here ventured to lay down—viz., that Science and Revelation occupy two distinct and separate spheres; that each may be regarded as different departments of one great empire of Truth; and that any attempt to make one interfere with the other will only bring them into open and ruinous conflict. The purposes of God in Revelation, being moral and spiritual, and not scientific, I read them in the former light, and not the latter. They teach me that I am saved by the Redemption of Christ, and that Heaven at last shall be my home; this is

the message of the Bible to my soul, and it is enough. As for questions of modern science, I have endeavoured to show in this paper, that He who inspired the Bible, while conscious of all future discoveries, held very much in reserve ; first because it was no part of His Divine purpose to reveal them ; and, secondly, because, had they been revealed, the language would have been unintelligible. This seems to be the firmest basis upon which all can rest their belief on the Bible, when it is brought front to front with the phenomena of modern scientific facts. And holding fast to it, I feel sure that we need be none the less reverent on one side in our Christian faith ; while we shall be all the more wise and successful on the other side, in our treatment of scientific unbelievers.

The Meeting was then adjourned.

REMARKS

By the Rev. J. CHALLIS M.A., F.R.S., F.R.A.S.,

Plumian Professor of Astronomy, Cambridge.

AFTER carefully reading Mr. Titcomb's paper "On Certain Magnitudes in Nature, and their bearing on Biblical Interpretation," I have been induced to comply with a request for some MS. remarks upon it, partly from the interest I feel in the subject, and partly from having written an Essay on the First Chapter of Genesis, which I produced soon after the appearance of "Essays and Reviews." This work, which is entitled "Creation in Plan and in Progress," was printed at the Press of the University of Cambridge, and published by Macmillan & Co., in 1861. As I am of opinion that if Mr. Titcomb had been acquainted with the contents of this publication (which I fear is now out of print), he might possibly have modified certain views expressed in his paper, I beg permission to offer for the consideration of the Institute a reproduction, as brief as may be, of such of the arguments therein contained as appear to bear immediately on subjects likely to be discussed when the paper is read.

In the first place, I have to state that reasons are given in that work for concluding that the language of Scripture neither is, nor can be, *unscientific*; that is, it cannot be *contradictory* to the language of Science. The arguments on this head are for the most part contained in the Introduction (pp. 4—13). It will suffice for the present purpose to adduce the argument (in pp. 6—9) relative to the distinction to be made between *physical operations* and their consequences in *personal sensations*, and to justify, in particular, on the ground of this distinction, the language of Scripture as to *the fixity of the earth*.

By experiment and mathematics it has been ascertained that *sound* is produced by *vibrations* of the air, that *loudness* depends on the *extent of the vibrations*, the *pitch* of a musical note on the *number of vibrations* in a given time, and that the *harmony* of two musical notes depends on the *ratio* of the number of vibrations corresponding to one, to the number of vibrations in the same time corresponding to the other. Thus, in one rank we have such names as *sound, loudness, pitch, harmony*; and in another rank *vibrations, extent of vibrations, number of vibrations in a given time, and ratio of numbers of vibrations*. Similarly, according to the undulatory theory of

light, we have what all the world calls *light, brightness, colour*; and corresponding thereto in the language of Science, *vibrations of the æther, extent of the vibrations, and number of vibrations in a given time*. Now in both these instances one set of names express *facts* (things made or caused to be) just as really as the other, but the two classes of facts are utterly diverse, and in essentially different categories. One kind (the former) may be called *personal sensations*, being proper to the individual, although universally experienced; while the other is a class of facts external to the individual, and understood only by the intervention of modern physical research.

Researches of that kind are made in departments of science which may be included under the general term *Dynamics*, and the facts and laws elicited, as involving the agency of physical force, may be called *physical operations*. The relation between the two classes of facts is such that the physical operation has its analogue and consequent in a sensational fact; but because the operations and the consequences are of totally different qualities, there exists no human knowledge or means of inquiry by which it could be anticipated that *such* consequences would follow *such* operations. For instance, it is out of the limits of human understanding to comprehend why the *sensation of sound* results from vibrations of the air, or the *sensation of colour*, as a *red colour*, from vibrations of the æther. The relation being one of *mere antecedence and consequence*, and not such a relation between cause and effect as those we have means of reasoning about, we can only say of it that it exists by the *immediate volition* of the Author of our being and of our sensations.

Exactly the same considerations are applicable to the fact that to *sense* the earth is motionless. Physical science has taught us that the earth turns round its axis in a day, and revolves round the sun in a year, and that the former motion is maintained by the *vis inertie* of the matter of the earth, and the latter by the same quality combined with the gravitating attraction of the sun. But nothing in physics can give a reason for the sensational fact that we are incapable of perceiving motion only so far as it is *relative* to our own motion, and, in consequence, are incapable of perceiving our own motion. Of the reality of the fact any one may convince himself each time he travels on a railway.

Supposing, now, we should be speaking of *sound*, or *colour*, and a man of science should turn round upon us and say that we are under a mistake, there being no such things as sound and colour, but only vibrations of certain media, we should judge him, and rightly, to be a very foolish person. Of exactly the same folly they are guilty who attribute fault or imperfection to Scripture because it speaks of the fixity of the earth, which is a sensational fact in the same category, and in the same manner real, as sound and colour.

From these considerations it would appear that Physical Science and the Science of Scripture stand apart from each other in respect to the qualities of the facts they are concerned with. In the former the Book of Nature is studied by means of observation and experiment, combined with mathe-

matical reasoning, the purpose being to ascertain the elements and laws on which Nature's operations depend, and to find out what may be called the unseen *machinery* of the Universe. The effect of knowledge so acquired is to augment our comprehension of the *power* and *wisdom* of the great Architect of Heaven and Earth, but goes no farther.

For the solution of social, moral, and religious questions, whether as between man and man, or between man and his Maker, Scripture alone supplies in perfection the necessary elements and principles. For this purpose it has no need to refer to the class of facts which are known only by means of physical research, but only to those that are commonly understood from information given by the senses. Accordingly, it is found that the former kind are entirely excluded from the Scriptures, being left to be gathered from indications and data derivable from God's Book of Nature.

Still, there are parts of Scripture which have a direct relation to physical science, as, especially, the account of the Creation in the first chapter of Genesis, and that of the Deluge in chapters vii. and viii. These accounts, however, consist exclusively of statements of such facts as might have presented themselves to the senses of an unscientific observer on the earth's surface at the time of their occurrence. This character of the account of the Creation given in Genesis i. being taken for granted, it will follow that the facts stated are to be put under the class of facts of observation; and, excepting that they are peculiar in having taken place antecedently to all human experience, they are susceptible of philosophic inquiry as to their causation just as the geological facts observed in the present day. I have, in fact, entered upon such inquiries in the before-mentioned work, and, in particular, I have argued that, according to the Scripture narrative, there was a *progression* as regards the elaboration of the earth for its inhabitants, and the order of the creations of plants, fishes, fowl, beasts, and man, of the very same kind as that which has been scientifically inferred from the facts of geology. This very noteworthy agreement is well insisted on, so far as relates to the progressive origination of structural organisms, in sections 18-20 of Mr. Titcomb's Paper.

(Respecting the Deluge, I shall limit myself to expressing the opinion that the operating causes described in the Scriptural account, when interpreted by the aid of modern physical science, were adequate to the production of the phenomena ascribed to them.)

But there are, it must be admitted, parts of the accounts in Gen. i. which appear to be self-contradictory; as where it is said that the divisions of time into day and night and seasons were effected by the luminaries of heaven on the *fourth* day, although the term "day" had already been used relative to three antecedent intervals. As far as regards the use of the term, the discrepancy would be got rid of by showing (as I have endeavoured to do in the work on Gen. i.), that the days of Creation are not intervals of twenty-four hours marked out by the sun's visible course, but ages of long duration, the limits of which were determined by definite steps in the process of the creation, and by alternations of darkness and light produced inde-

pendently of the sun's influence. On the duration of the Creation-days more will be said presently.

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 beginning of their *visible* existence, which could only be from the time when they began to determine days, and months, and seasons, and years. It would have been contradictory to the principle uniformly maintained in this record, that of stating only what is perceived by the senses, to have indicated that the luminaries had actual existence before they performed offices recognizable by human sense, for that would have been trenching on the ground of *physical science*. 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.

I propose now to state briefly the argument from which I have concluded, *exclusively on Scriptural grounds*, that the six days of Gen. i. are periods of long duration. (See the chapter on the Seventh Day, in pp. 101-111.) In what I am about to say I shall take for granted, as the only rational view that can be entertained respecting God's Word, that the whole of it has virtually but *One Author*, the Divine Spirit, notwithstanding the number of human writers that have taken part in its composition, and the diversities of times, places, and circumstances under which the several books were written. The same Mind, for instance, dictated "the tree of life" in Gen. iii. 24, as in Rev. xxii. 2. There is so much of intimation in Scripture as to where, when, and by whom some parts were written, as serves to show that human agency has been employed in the composition of it, and so much silence on these points with respect to other parts (as the four Gospels), as to indicate that knowledge of this kind is not essential, so long as "all Scripture" is regarded as having been written either under the control, or by direct inspiration, of the Holy Spirit. Also, assuming that the Scriptures were written for the purpose of preparing souls for an immortal existence, it may be admitted that in the form in which we possess them at the present day, with all the imperfections and variety of readings due to the negligence or ignorance of scribes, they are still adequate to that purpose. In short, I do not hesitate to express my belief that, on its own principles and data, the words of Scripture as much admit of philosophical inquiry as do the facts of Nature on the principles of physical science, and are just as capable of giving trustworthy and exact answers to interrogatories rightly conducted.

This being premised, I beg to say that I am unable to accept the view advocated by Mr. Titcomb, that the cosmogony of Gen. i. was revealed to Moses by "vision," and that he made it known to the Hebrews in a form suitable to their powers of comprehension. If revealed by *vision*, in what respect does this mode of communication differ from *inspiration*, and why not admit at once that this portion of Scripture gives the *ipsissima verba* which Moses, or whoever was the writer of it, was inspired by the Spirit to write? If it be anything short of this—if any human element was concerned in framing its language—it is of no value whatever. Since, as is admitted, future events can be predicted only by inspiration of the Holy Spirit, a revelation of what took place long anterior to all human experience equally required the inspiration of the same Spirit. Accordingly, it may be asserted that the real author of Gen. i. was perfectly acquainted with the process of the creation from beginning to end, and the purposes for which it was planned and executed.

Next, I remark that of itself it seems wholly unreasonable to suppose that the Holy Spirit meant to tell us that the Creator of the universe, after completing His work, rested twenty-four hours, or that the seventh day was a natural day. But besides the intrinsic unreasonableness of this idea, the sacred narrative itself, if viewed without preconception, would, I think, be seen to contain a refutation of it. For it asserts that three of the creation-days had already elapsed when the light of the sun began to define the natural day, evidently thus making a distinction between the two kinds of days.

Further, the interpretation put upon Gen. ii. 2, in Heb. iv. 3-10, forbids taking the duration of the seventh day to be that of a natural day, inasmuch as the author of that epistle places in juxtaposition (verses 4, 5) the statement in Genesis that God rested on the seventh day, and a passage in the Psalms (xcv. 11), containing, as spoken by God, the words, "If they shall enter into my rest"; and it is clear that he intends thereby to indicate that the *same* rest is spoken of in both passages, for he argues that the rest remains for the people of God, "although the works were finished from the foundation of the world." This last sentence refers to the ending of the works spoken of in Gen. ii. 2, and implies (by the word "although") that in that passage the Holy Spirit declares *proleptically* the completion of a plan designed from the beginning; so that this declaration is not inconsistent with a seventh day of rest to come. In the mind of the Eternal Spirit the design and the execution are one and the same.

But if this be so, *the sixth day is not yet ended*. Now, it is particularly to be observed that the terms which narrate the creation of man on the sixth day, and his dominion over the whole of the earth and all living things, are in accordance with this inference, inasmuch as the creation and sovereignty of the *race* (*ἄνθρωπος*) are there spoken of, the creation of Adam and Eve, the first individuals of the race, being recorded in Gen. ii. So long as the succession of generations goes on, the creation of man is not finished, and the seventh day *not* come.

I fully expect that these views will be objected to as weakening the Scriptural authority for the observance of the Sabbath. I think, however, that the reasons I am about to urge will show that this inference is altogether without foundation. There is not in Scripture a tittle of evidence that the Sabbath was commanded to be observed, or was observed, before the passage of the Israelites through the Red Sea. Soon after that miracle the Sabbath is first mentioned (Exod. xvi.) in connection with another miracle, the gathering of manna in six days, and the double supply on the sixth day to serve for that and the seventh. Then follows its institution from Mount Sinai as one of the commandments of the Decalogue; and lastly, when Moses rehearsed the Ten Commandments before the people, as recorded in Deut. v., he concluded the Fourth Commandment in these words: "Remember that thou wast a servant in the land of Egypt, and that the Lord thy God brought thee out thence through a mighty hand and a stretched out arm; therefore the Lord thy God commanded thee to keep the Sabbath day." It is to be noticed that in the reason here given for keeping the Sabbath no mention whatever is made of the six days of creation.

Putting all these statements together, any one, I think, only a little versed in Scriptural symbolism might see that the institution of the Sabbath is in no respect *commemorative*, but *typical*, having the character of a *covenant* whereby God undertakes to deliver His believing people from the bondage of the present evil world, "spiritually called Sodom and Egypt, where also our Lord was crucified" (Rev. xi. 8), and to give them rest and eternal life (signified by the manna) in the seventh day yet to come. Thus, the reason for the observance of the Sabbath, as given in Deut. v., is in perfect accordance with that given in Exod. xx., always supposing that the *antitype* of the seventh day of observance is that day of eternal rest which supervenes at the end of this world, and which all the faithful of all times have looked forward to. Hence it may be concluded that there is just the same reason in the Christian dispensation that there was in the Jewish for observing a seventh day.

From this argument, it would appear that the institution of the Sabbath was delayed till, by God's miraculous dealings with the Israelites, it could receive a spiritual signification, and be observed acceptably with *faith*. To observe it with the accompaniment of faith, is to regard it as a symbol of the covenant of everlasting rest and life which God has made, through Christ His Son, with all the faithful, and to wait in hope for the fulfilment of that covenant. By a formal observance without such faith, in the strict manner of the Pharisees which our Lord condemned, it is not possible to please God.

I have now only one more remark to make relative to the views contained in Mr. Titcomb's paper. If it has been rightly argued that the period during which the race of man has existed on the earth (which, to take the lowest computation, is very nearly 6,000 years) is but a portion—possibly a *very small portion*—of the sixth day of creation, it will follow that that day, and, consequently, all the days, are periods of long duration. And whereas

neither the duration of the sixth day, nor that of any of the other days, is definitely limited by any statements in Gen. i., the vast periods of time which, as Mr. Titcomb shows, are demanded by astronomical and geological facts, may be conceded without contradicting the truth of the sacred narrative, insomuch that we may conclude that on this point Scripture and Science are at one.
