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ORDINARY MEETING, MAY 6TH, 1867.

THE REV. WALTER MITCHELL, VICE-PRESIDENT, IN THE CHAIR.

The minutes of the previous Meeting having been read and confirmed, the Honorary Secretary announced that, in return for our *Journal of Transactions*, the Royal Institution of Great Britain had, through its Secretary, presented the Institute with a complete set of its Proceedings from 1851 to 1866, in four volumes, and that three pamphlets had also been received from Mr. Patrick McFarlane, a Member of the Institute.

The following Paper was then read :—

ON THE LOGIC OF SCEPTICISM. *By the* REV. ROBINSON THORNTON, D.D., *Head Master of Epsom College, Mem. Vict. Inst.*

THE conclusions, or supposed conclusions, arrived at by modern science in opposition to the statements made in the Books which we accept as containing a Divine Revelation, have been generally parried by throwing doubt upon the facts or observations on which they are founded. Believers in the genuineness and authenticity of the Old and New Testament have been contented to cast discredit upon the accuracy of observers, or have even been tempted to accuse them of misrepresenting or inventing facts, for the sole purpose of subverting the authority of the writings which others held sacred. This accusation may possibly be merited in some few cases. Hasty observations may have been reported as nice and careful: inferences may have been registered as facts: and without doubt observations have received a direction, and reports a colour, from a foregone conclusion. But it would be doing a great injustice to the majority of those who advocate the views which our Institute was founded to combat, if we attributed to them any design but that of arriving at truth by means of truth. We contend that observations have been incorrect, and facts mis-stated, not that they have been deliberately falsified. However, it is not sufficient to impugn the records of the senses. Cogent argument as it is, if we are able to

point out a case where the observer's sight or hearing has deceived him, or where a statement, by passing from one to another, has been converted into something like the contradictory of its former self, it is rarely we can produce it. Throw what doubt you will upon the accounts of things seen, heard, analysed, discovered, you cannot expect to find modern science at fault in that which is perhaps the chief among her many glories, a rigorous and careful system of observation.

But while it is unfair and one-sided to impute evil motives, or even to suggest failure on the part of a practised observer, and somewhat suicidal to weaken the value of facts which may after all tell on our side, there can be no objection to our sifting diligently the logic of sceptical arguments, and showing that whatever the state of the case may be as regards the correctness or incorrectness of the facts laid down to argue from, the mental process is not free from error. I must not be considered capable of the presumption of attempting to execute such a task for the whole, or even a part, of what is alleged against Scripture; and indeed it is scarcely our province to thrust ourselves into controversy: my object will be to call attention to the nature of logical processes in general, and so to point out where it is that we may expect to find the weakness of the weapon aimed against the believer in the absolute truth of our written Revelation.

Logic is defined as "The Science of the Laws of Thought." Whether this definition be adequate or not, we will not stop to inquire; but will go on to define a logical process as "the passage of the mind from one thought to another." By "thought" I here mean, not a simple notion, but a compound notion, asserting something concerning the relation of two or more simple notions. This passage or movement of the mind is, like all other motions, subject to its own laws; but there is this difference between the motion of intellect and of matter, that while the latter cannot take place at all except according to law, the laws of mental movement may be apparently, but not really, obeyed; or, in other words, to get rid of the fallacy latent in the word "law," physical motion is variable only within limits; intellectual motion may vary infinitely, though one movement only conducts to Truth.

This movement of the intellect from one thought to another is itself called by the name of "Thought." The superior power of the Greek language enables it to distinguish (which we cannot do) between "a thought," *i. e.*, the object or fact we think of, considered with reference to our own mind (*νοούμενον, νόημα*), the act of thinking (*νόησις*), and the passage from one to another, "Thought" simply (*διάνοια*).

Those notions of the relation of simpler notions which I have called "thoughts" are obviously of different kinds. We may have a relation between class and class, or between individual and class, or between individual and individual. And so by a simple calculation we may see that there are nine different processes of the mind: from the relation between classes to another between classes, or between individual and class, or between individual and individual; or, again, from the relation between individual and class to that between classes, or from that between individuals to that between classes, or between individual and class; or from that between individual and class to another between individual and class, or between individuals, or from a relation between individuals to another between individuals. The first three of these processes coincide mainly (for I shall not weary you by analysing too closely) with what is termed Deduction, or Synthesis; the next three with Induction, or Analysis; the remaining three, though least scientific in appearance, are as a matter of fact the commonest processes of all. We habitually reason from individual cases to individual cases. It is the opinion of many logicians that in such reasoning we insensibly generalize and particularize again; they conceive that a process from individual to individual is impossible, and that the mental road lies through a universal. With all due deference to high authority, I am inclined to maintain the opposite, and to hold that the mind does actually proceed from one individual notion to another, without passing through any induction, rapid or slow.

Each of these mental processes has its own special law or rule of guidance. The law of Deduction is expressed—or was intended to be expressed—in the "*dictum de omni et nullo*" of old logicians. We may term it the law of "Universal Truth." Granted a general proposition, it is equally applicable to every case *which comes under it*. Granted a relation between classes, that relation holds good for every portion of those classes.

The rule of Induction may be characterized as "the law of Uniformity." Observed a fact with regard to an individual, *supposing that individual to be the adequate representative of a class*, you can infer a class-relation.

The law of the third process of the mind I shall term "the law of Analogy." Observed a fact with regard to an individual, you infer a similar fact about another *similar* individual.

If these somewhat broad statements about the laws of the three mental processes be taken as in the main correct, we can easily see where error may arise; namely, from some violation of the special law which regulates the truth of the process.

Deduction has been fairly enough termed (by Mr. Mill) the deciphering of our manuscript notes. As far as mere positive science is concerned, this description (for description it is) of Deduction is correct. It is when we come to Geometry, Psychology, and Theology, that we find the difficulty of acquiescing in the application of the name "manuscript notes" to the intimations of a Creator's Will and Being, and the necessities of thinking to which He has subjected our intellect. But let the term be accepted. It is plain that the "law of Universal Truth" requires, for a correct passage of thought, that the relation inferred should really be contained in short-hand in the manuscript notes: that the individual case to which the general is applied *really does* come under it.

The fallacy then will be either to introduce a false or unsuitable relation; or else to apply a suitable enough relation to a case which seems to come under it, but does not actually.

Of the first form of fallacy none is commoner, none more in use among sceptics, than that which is called the *argumentum ad verecundiam*. We are told, You must allow this, you must deny that; and when we ask why, we receive the reply, "Because Professor A. or Mr. B. has said so. If you do not acquiesce you are guilty of the presumption of doubting them." The argument is transferred from the truth of fact α or fact β to the credibility of A or B.

I should not have alluded to this form of fallacy were it not for the fact that the sceptical school resolutely deny to believers the argument from authority, while they themselves use it. If we urge the acceptance of Scripture because it has been accepted by so many, by thinkers and by workers of so many ages, and such varied modes of life, we are told immediately that the question is one, not of opinion, but of truth; that it shows a blind deference to the unreasoning credulity of ignorant ages to plead for the acceptance of a book because it has been accepted for two thousand years. On the other hand, if we venture to prefer our Scripture to the somewhat vague and uncertain generalizations of geologists, and the like, we are met forthwith with the authority of learned names and ordered "*favere linguis*."

I call this pushing the "argumentum ad verecundiam" too far, an instance of the fallacy of false or unsuitable relation, because, instead of having the relation between class and class (or between individual and class) clearly pointed out, we have merely given us the dictum of an individual concerning that relation.

But, supposing the relation clearly and adequately stated, we come to another form of fallacy; that of proceeding to

another relation apparently, but not actually, connected with the foregoing, and so not really a portion of the Universal Truth. To such fallacies as these Aristotle devotes a whole treatise; and there is scarcely a logical writer who has not touched upon them. I wish to call attention to two, which appear the most common.

The first is technically called "*a dicto secundum quid ad dictum simpliciter.*" A statement having been made, with certain limitations and qualifications, these are tacitly put aside, and the statement employed as if it were made without them. Thus, when we allow the singular phenomenon of *parthenogenesis*, as an exceptional mode of propagation, to be accounted for by peculiar physical circumstances, we may be considered to have acquiesced in the possibility of its being the rule rather than the exception. Or, when we quite agree with the truth of Mr. Darwin's pigeon experiments, and allow that, *within limits*, varieties almost infinite in number may be produced almost at will, we may be taxed with granting that similar variations may take place, and be perpetuated, out of those limits.

The technical term for the second of these fallacies is "*ignoratio elenchi.*" The word *elenchus* signifies here the contradictory of the proposition which is opposed; and the fallacy consists in "ignoring the *elenchus*,"—that is, substituting for it, and proving, instead of it, a proposition something like it, but not incompatible with the proposition in question.

As an instance of the *ignoratio elenchi*, I may bring forward the manner in which the miracle of the battle of Beth-horon is dealt with. The Scriptural language on the subject is, as we might expect, popular, and not scientific, and has moreover a poetical cast. "The sun stood still." The opponents of Scripture meet this by showing that, as the sun does not move in the heavens, it need not be commanded to stand still; and even if we understand the words of the diurnal revolution of the earth, such an utter confusion of all things would occur from its suspension that we cannot conceive a Deity of law and order sanctioning such an invasion of His system. Without going into the theological question of the nature of the Divine power and will, I think we may call this an *ignoratio elenchi*. What Scripture in effect states is, that for some reason or other, not given, the sun's light was visible, and the sun himself appeared in one place, longer than usual. The "*elenchus*" of this would be, "The event did not happen at all;" or, "It is hardly conceivable that it should happen in any way consistently with what we know of the Divine order."

The proposition actually proved is, that the event did not happen in a particular way—viz., by arrest of motion: a proposition by no means incompatible with the perfect truth of the narrative of Joshua.

These three fallacies appear to me to be those which are most commonly to be found in the Deductive logic of Scepticism. That other violations of the law of Universal Truth, as I have called it, occur in sceptical writings and arguments, is highly probable, if not morally certain; you will observe that all such false reasoning derives its falsity from the regarding as the portion of a class placed in a certain relation some class or individual apparently but not actually belonging to that class.

I come now to the fallacy of Induction: the neglect of the "law of uniformity." The individual case from which the induction starts must be, according to this rule, the adequate representative of a class; otherwise there can be no uniformity whatever. A false induction, therefore, is made where a relation between class and class is inferred from the relations of an individual not really representing, but only seeming to represent, one of those classes. There is no branch of science, I suppose, in which errors of this kind have been more rife, than geology. A number of facts having been carefully and patiently accumulated, geologists proceeded to their induction, and arrived, as they thought, at irrefragable universals, incompatible with the truth of the Scripture narrative. But their store of facts was not exhaustive. Some new and unexpected discovery has completely modified a proposition once regarded as almost axiomatic. I need only refer to the effect of the *Eozoon Canadense* on the appropriateness of geologic nomenclature; and the declaration of one of its most eminent professors, that the whole science must be remodelled.

This fallacy was the one against which the old Induction, "*per simplicem enumerationem, ubi non reperitur instantia contradictoria,*" failed to guard. It is not the multiplying of affirmatives, and the absence of negatives, that constitutes a valid induction: it must be made clear also that if any negatives existed, they would be present; that the *instantia contradictoria* would be sure to be forthcoming if there were one. And thus we find that, to attain truth, we must (as Bacon saw) either be able to interrogate nature by arranging circumstances for ourselves, and so making an *experimentum crucis*—a hand-post experiment—or resort to some method of inquiry which shall eliminate all that is unimportant, and show us what is the real representative of the class whose relations we may be desirous to investigate. Logicians reduce these

methods to four—viz., the method of Agreement, of Difference, of Residues, and of Concomitant Variations. I mention these, not because they have any special reference to the logic of scepticism, but because, as I am on the subject of incorrect reasoning, I wish to point out the especial danger of error in the third method, that of residues. The rule for this method is thus given by Mr. Mill. "Subduct from any phenomenon such part as is known by previous inductions to be the effect of certain antecedents, and the residue of the phenomenon is the effect of the remaining antecedents." And the same logician cautions the observer against possible error. "We must be certain," he says, "that the residual antecedent is the only one to which the residual phenomenon can be referred: the only agent of which we had not already calculated and subducted the effect." We must also be certain, it might be added, that the residual antecedent does not consist of many separate antecedents, one of which, and one only, is the real antecedent of the phenomenon, the rest being without effect. For if we are not certain of this we may attribute to certain inert circumstances a share in producing a phenomenon with which they had nothing to do. Thus we may fall into the error of attributing undue influence to conditions which really exerted no influence whatever, or may even select as the cause of a phenomenon that which has really no connexion with it at all. I might instance as an approximate example of this kind of error, the case of the Neanderthal skull. Its fossilized character, the absence of gelatine and chondrine, its position, and such portions of the phenomenon, having been accounted for, there remains its peculiar form. What is the reason of this? Subduct all other peculiarities as explainable and explained, how do you account for it? The sole antecedent which appears to remain is its antiquity; and if, in accordance with the method of residues, we attribute its peculiar shape to its age, we are led to the inference that the primæval race in that part of the world must have been a different race from any now to be found—*pithecoïd* men, if not anthropoid apes. But there is another possible cause which does not appear in the residue of antecedent circumstances, which I believe is now accepted as the true reason of the peculiarity of this skull: it is an individual distortion—an abnormal growth exhibiting itself among men, who were by no means *pithecoïd*, but such a race as the scriptural ethnology might lead us to expect to find settled in early times in that part of the world. And thus the sceptical argument against the truthfulness of the scriptural anthropology drawn from the appearance of this phenomenon, loses its support.

Closely connected with the fallacy of imperfect induction, or rather a form of it, is what I may term the fallacy of *negatives*. It is the case where the non-appearance of the *instantia contradictoria* is taken as equivalent to its non-existence: whereas, as was observed above, we must be sure that if there were any instances to the contrary, we should have heard of them or discovered them. This error is obviously sufficient to vitiate the whole of an induction. It is inductive in its character; but there is a fallacy which (*mutatis mutandis*) penetrates into the region of deduction, and which I should call by the same name, fallacy of negatives. It consists in taking that which is *not proved* as *disproved*. The overthrowing of one out of several arguments in favour of a certain conclusion does not prove that conclusion to be false; it only destroys one syllogism in its favour. It may be a very good axiom for practical purposes that *de non apparentibus et de non existentibus eadem est ratio*; but it will never do to lay down that everything not proved is false. As an instance of the fallacy of negatives, I may allude to the sceptical argument against the fact of the Resurrection, that it is not mentioned in Roman records. So accurately were they kept, it is said, that such an event must have been recorded, and discussed at Rome, either as a philosophically interesting fact, or as a religious portent requiring expiation. Now without referring to the explanation furnished by Scripture itself, viz., that the soldiers stated that they had slept at their post, and allowed the body to be stolen, and that the matter was hushed up by means of a large bribe, we may rank this argument under the fallacy of negatives. How do we know that the matter was not recorded and discussed as alleged? True, we do not find these records, we have no account of these discussions; but are we to infer that there were none? Is it not probable that hundreds of other remarkable events were duly reported and made the subject of conversation, of which no record remains at this day? But further, it has always struck me that the argument against a total deluge, drawn from the state of the extinct volcanoes in Auvergne, exhibits this fallacy. I must not be understood to be expressing any opinion,—though I have one,—on the subject of the total or partial nature of the Flood; I am only discussing the logic of a particular argument. As I understand the reasoning, it is this: the appearance of certain volcanic craters in Auvergne is such as to show indubitably that they have not been covered with water since their last eruption. Now there is no record of any eruption having taken place there within the memory of the human race, nor any tradition of their ever having been active. Consequently the last eruption

must have taken place before the creation of the present race of men, and therefore before the Flood; and therefore the Deluge must have been partial, or else it would have altered their appearance. The whole argument falls into a syllogistic form thus:—If there has been no eruption since the Flood, the mountains would have exhibited traces of the Flood, supposing it total; but there has been no eruption since the Flood; therefore the mountains would exhibit traces of the Flood, if total. If the Flood were total, the mountains would exhibit traces of it; but they show no such traces; therefore the Flood was not total. This is what logicians call technically a double hypothetical, first constructive, then destructive. No possible doubt can exist of the truth of either major, considered as a hypothesis; and the minor of the second hypothetical is a matter of observation. The correctness of the argument therefore depends on the correctness of the first minor, “no eruption has taken place since the time of the Flood.” This proposition is proved as follows. No event of which there is no record ever took place; a post-diluvial eruption of these mountains is an event of which there is no record; therefore none such ever took place. This syllogism is correct in form; but the major is palpably false, and I rather think the minor is not altogether certain. I believe that allusions have been found to a volcanic eruption in or near the district in question; and we know from the example of Vesuvius previous to the eruption of 79 A.D. that a long period of inactivity is not impossible in a volcanic district. The fallacy of negation is contained, however, in the major. Is it true that no unrecorded event ever took place? Are we to suppose that the rude Kelts, or the still earlier Fins, or Euskara, of the country we now call France, preserved any records or traditions of natural phenomena? Are we to suppose that the Roman invaders, in 125 B.C., would have cared to collect and retain such records and traditions, had they been preserved up to the invasion? or that the Greek colonists of Massilia in 600 B.C. would have carefully handed down to their children the vague traditions of a number of savages? Nay, more, have we in our possession all the papers and documents treating of the physical aspect of Gallia Braccata, so as to be certain that none of them mention a tradition of the Arverni, that Divine fire had once been kindled on the summit of their hills? Men must be prepared to assert the probability, at least, of all this, if they employ this argument in the manner I have described. If they are not prepared to make such an assertion, their argument is fallacious.

While I am on the subject of errors connected with inductive reasoning, I must not omit another fallacy, which can be

traced in several sceptical arguments. I may call it the fallacy of *supposed* uniformity. The law on which all analytical argument depends I have termed the law of uniformity; but before we press such an argument, we must be sure that the uniformity really exists. If we are not certain of this, we shall be liable to fall into the error of making cause disproportionate to effect, or effect to cause. The most remarkable instance of this fallacy is to be found in the arguments alleged against Scripture history, drawn from the thickness of deposits on the banks of the Nile and elsewhere, and from the finding of pieces of pottery at a depth in alluvial soil, which seem to show that human art existed many centuries before the period which the Bible seems to assign to the creation of man. All these arguments depend on the supposition that deltas and other alluvial deposits are uniform in their growth; that a river bringing down silt with it deposits exactly the same thickness yearly now that it deposited thirty-five centuries ago; and that we may accordingly calculate unerringly, from the depth of a deposit, and the present rate of its deposition, how many years, or millions of years, have elapsed since the first layer assumed its place. But is this true? I apprehend that those who have been at the mouth of the San Juan, or the Aspro-potamo, or in the Chinese seas, will be of a different opinion. The rate of deposition is not necessarily uniform; and the potsherds found deepest in the Nile mud need not be earlier than the time of the first settlement on its banks under Men the Hamite.

I come now to the third logical process, that from one individual relation to another, guided by the law which I call the law of analogy. What the fallacy is to which this process is liable, we may easily see. The guiding law is violated by passing in thought from one individual to another which is not really but only apparently similar; by contenting ourselves with a hypothetical likeness, and so employing a false, not a real, analogy. The tendency in our minds, which I have already pointed out, to prefer the process from individual to individual, renders this fallacy of false analogy one of the commonest and yet often least easy to detect. The most effectual mode of exposing it seems to be that of completing the whole intellectual route, and, instead of passing directly from individual to individual, supplying the law of general probability under which both come. If I throw up a stone and find that it turns and falls down, I infer that if I throw up another it will do the same. The mind passes from individual to individual by the law of analogy. This law is really subordinate to that of uniformity, and each analogy, to be correct, ought

virtually to contain within itself an induction and a deduction, arriving at, and returning from, a general probability. Thus (in the instance just given) the correctness of the analogy is shown by reasoning thus:—This stone falls; what is true of this stone is probably true of all stones, this one being, as far as I can see, an adequate representative of the class: if, then, all stones will (probably) fall when thrown up, this other stone will (probably) do so. The probability is inserted as a modification, because there is no opportunity of testing accurately whether the stone in question is an accurate representative or not of the whole class. If there were such an opportunity, a genuine induction would be the result; where no testing can take place, we must be content with probability. This rapid seizing of an analogy, and either working from one to other individual cases, or summing all up in one grand induction, was not unknown to the Greek logicians, and seems to be what is spoken of by Aristotle under the name *ἀρχήνοια*, or nearness of reason. But *ἀρχήνοια* has its dangers. The similarity between individuals, which it lays hold of, may be in accidentals, and not in essentials, and the real essential differences may lie exactly where they are last to meet the view.

The sceptical reasonings relative to the criticism of Scripture appear to contain this fallacy. Scripture, it is urged, is a written document, and should be subjected to the same process of examination as every other writing. Scripture history is a collection of legends, and must be interpreted just like all other historical legends. If Romulus is a myth, so is Moses; if the supernatural appears in the battle of Rephidim and the battle at the Lake Regillus, it is as incredible in the one tale as in the other. Here we have an instance of false analogy. Scriptural documents are not like others, because they put forth different claims on our belief. Scriptural tales—legends, if you please to call them so,—do not stand on the same footing as heathen traditions: they were committed to writing, by the confession of their opponents, at a period far earlier than that at which any other human records were written, a few undeciphered hieroglyphics, perhaps, excepted; they have continued to be accepted and believed by a large number of persons, and have been quoted as authentic history, even to the present time, while other legends have long been relegated to their true place, and though, perhaps, not scientifically interpreted, have still not been put forward as giving the literal truth. Hence the analogy drawn is false: Scriptural stories are not representatives of the class to which historical legends belong, nor are the myths of heathenism fairly

specimens of the class of documents which claim a divine origin, and have long been allowed their claim.

I am sensible that I have not gone so deeply as I should have gone into psychological inquiry with respect to the direct process of the mind from individuals to individuals. The whole subject of the analogy of individual relations is one of deep interest, and especially to the theologian, to whom a single soul, with its special powers, trials, dangers, and aids, is an object for reverential study. Perhaps some member of our Institute, whose leisure for thought and powers of thinking enable him to work the subject more thoroughly, will take up what I have thus somewhat presumptuously ventured to touch on. We need a "Kritik" of the whole process of reasoning by analogy. There is another "Kritik," also, which logical science appears to need—a criticism of, and canons for, the Logic of Contradictions. For we must remember that every sceptical argument aimed against Scripture involves a double process: the establishment, or, at least, the assertion, of a certain proposition, and the comparison of this proposition with the propositions enunciated in Scripture on the same subject. Here we have three possible fields of error: the logic of the sceptic, the interpretation of Scripture, and the comparison of the two propositions. I have already endeavoured to point out where sceptical logic, constructively considered, may be possibly found to fail, and we leave to Exegetical Theology to determine what Scripture really does assert. Doubtless the Bible has often been made to say anything but what it does really say, but the investigation of its import belongs not to Philosophy. However, suppose the statement of Scripture to be clear, and the scientific conclusion alleged contrariant thereto to be logically correct, we have still the comparison between the two to examine. May it not often happen that two propositions, apparently contrary to one another, are really, in logical language, only subcontrary, capable of being true together; representing, perhaps, two different sides of the same ontological truth,—two equally necessary canons,—but referring to different conditions of being? We know it to be true that all men are mortal, and still, in spite of logic, just as true that no men are mortal. The ambiguity in the word mortal is easily detected here: may not a deep thinker's rigorous "Kritik" of the whole subject of contradiction clear away many a supposed discrepancy between the Book of Nature and the Book of Grace?

I must conclude this paper, as I did one which I had the honour of reading before this Institute about a year ago, with

an apology for having made so few references, and cited no authorities for my statements. I have designedly abstained from so doing, for I am alive to what has been well called the fallacy of quotations. A visit to a library, or a reference to one's own bookshelves, would enable one to swell a paper out with long passages, relevant or irrelevant, from Pacius and Zabarella, from Petrus Hispanus and Salabert, from Hamilton and Mill. But I repeat what I said then, that our object is not to show what men have thought, but to induce others to think. The only weapon which mind can use against mind is mind itself: σοφία γὰρ ἂν σοφίαν παραμείψειεν ἀνὴρ.

THE CHAIRMAN.—I need not ask you to return thanks to Dr. Thornton for his interesting and very learned paper. I am sure it is one we shall all value very much, and one which will require deep study. It is almost impossible to take it in fully from merely hearing it read, but if any gentleman has any observations to make we shall be glad to hear them.

MR. INCE.—Dr. Thornton does not seem to be aware that between the years 400 and 500 A.D. those mountains in Auvergne were in active volcanic operation, and that there are records of the fact in existence still, in letters from the Bishops of that part of France to other Bishops, begging their prayers during the prevalence of that calamity. I have shown that document, which I extracted from the *Quarterly Review*, to Mr. Reddie, and I will take an opportunity of showing it to Dr. Thornton.

REV. ROBINSON THORNTON.—I have alluded to this, though, it seems, not definitely enough, in my paper; and the reason I did allude to it, was because I had had the pleasure of hearing Mr. Ince make that important statement once before. I was then interested in it, and it was in my mind when I put in the paragraph, "allusions have been found to a volcanic eruption in the district." But I did not like to say more, because I did not wish to "take a plum out of his pudding."

MR. REDDIE.—I think it would be interesting to our members to have this circumstance which Mr. Ince has alluded to, and which I supposed Dr. Thornton to have had in view in that passage of his paper, extracted from the article in the *Review* in which it appears. I am sorry that other occupations prevented me from getting hold of the passage and citing it this evening, but I shall endeavour to append it as a foot-note in our *Journal of Transactions*, our object being to make all our discussions as full and complete as possible.* One question I should like to ask Dr. Thornton, with reference to an old friend of mine—the Neanderthal skull. There is a passage in his paper that I do not quite understand; he says that this was probably a skull of "such a race as the Scriptural ethnology might lead us to expect to find settled in early times in that part of the world." Although he very properly calls it "an individual distortion,"

* *Vide* NOTE, p. 166.

“an abnormal growth,” he still appears to expect we might find a race of people all possessing this abnormality and distortion, although he also described it as “individual.” I do not quite understand what view Dr. Thornton intends to express on the subject; but as far as I understand the state of the case with reference to the Neanderthal skull, it is simply this: that it is a purely individual and exceptional distortion arising from a disease known as synostosis or ossification of the sutures. The human skull, as you know, is divided into parts which fit into one another, so as to allow room, however, for the growth of the skull, as the child grows into the adult and afterwards into manhood. In the Neanderthal skull these saw-like divisions have become ossified and stuck together; and there not being the ordinary means for the skull enlarging itself normally in every direction according to the growth of the brain, the skull has grown in a distorted form, and more particularly towards the forehead, by the pressing out of the frontal sinus, thus giving a depressed form to the head. There can be no doubt about this fact. Dr. Barnard Davis made a careful examination of the cast of the skull; and I have never heard it questioned by a single individual, since he put out his valuable memoir on the subject, that that was the state of the case. The skull has, therefore, nothing of a race characteristic. Of course, it is perfectly possible that the heads of people living in a certain state of nature, without very much study or anything to occupy them of an intellectual kind, and with all their faculties of observation constantly exercised, arising from their being engaged in war, in hunting, and so on, might, if there is any truth in phrenology, naturally tend to develop strongly over the ridge of the nose, and this might also prevent the elevation of the head, where the organs of veneration and benevolence are supposed to be situated. An instance of the reverse kind, in a people highly civilised, though their civilization is different from ours, may perhaps be found in the Japanese. I think any one who has paid a visit to that very interesting exhibition by the Japanese Jugglers, now in town, must have remarked, that, from the youngest child there to the oldest person amongst them, their heads are peculiarly developed where the faculties of reflection predominate, their foreheads being extremely elevated, and the children’s remarkably so. Besides the Neanderthal skull, Dr. Davis has, I believe, the casts of some British skulls, the history of which is known, and which are developed in the same abnormal way as it is, from the same disease, the sutures being ossified. All this can be explained in a natural way as an abnormal development; and does not imply anything like a race characteristic. I do not understand why we should suppose that it does.—

The CHAIRMAN.—Dr. Thornton has guarded against the idea of a race; he says, “an abnormal growth exhibiting itself among men, by no means *pithecoïd*—but such as the Scriptural ethnology might lead us to expect to find settled in early times in that part of the world.”

Mr. REDDIE.—But I do not understand why you should expect from the scriptural ethnology, that there should be a race of people all having synostosis in parts of the world settled in early times, if that is meant. As to this I should like some explanation; and I only add that I have heard this

question discussed by all parties—both by those who wish to make out the skull to be *pithecoïd* and the reverse,—and I have never heard Dr. Barnard Davis's conclusions once questioned. We have some gentlemen now present, capable of giving an opinion, if they will be kind enough to do so ; but I do not think there is anything in the Neanderthal skull to lead us to expect that there ever was a race of people settled in the world who had skulls anything like it.

Dr. THORNTON.—I never imagined the skull to be the representative of a race, but an individual distortion. The race settled in that part of the world in early times, I conceive to have been Fin ; but it is not necessary to enter on that subject now.

Mr. REDDIE.—I am glad to have elicited this explanation, which I see is quite consistent with what the paper says. I believe one of Dr. Davis's abnormal skulls is that of an Irishman—a Celt ; and I suppose no one race is more subject to synostosis than another.

Mr. WARINGTON.—I confess I am somewhat sorry for the title of the paper, though as regards its matter I should agree with it very well. The impression which that title is likely to convey, and which I suppose it was meant to convey, is that there is a peculiar lack of logic in sceptical objections. I am quite aware there is a lack of logic ; the only thing I question is its peculiarity. When we look around and observe the way in which men of science, or indeed men generally, are in the habit of drawing conclusions, we see, that in cases where theological prejudice has not the slightest influence, they are so perpetually falling into the very same logical errors, that it is plainly unjust to them to suppose that when they do so in opposition to Scripture, it arises from any peculiarity of the position in which they are placed, or of the object which they have in view. I am quite aware that in the substance of the paper Dr. Thornton has not expressed himself at all strongly in this way. But it strikes me that in speaking, not of the fallacies of scientific origin, but of the logic of *scepticism*, the impression is given that these fallacies are in some way characteristic of sceptical objections, and are not to be found elsewhere. To remove that impression I would briefly point out a few cases in which there are similar errors observable on the other side. There is another kind of scepticism as injurious at times, or even more so, than that of which we have heard to night : viz., theological scepticism in regard to science ; a scepticism which has certainly done a good deal to cause the breach at present existing between Scripture and Science. On purely theological grounds, men have been sceptical of science, and in being so have fallen into the same fallacies of argument as men of science on the other side. I will not go through all the paper, but I will take one or two instances by way of example. First, as to the argument from authority, that A. B. says such and such a thing is true, and therefore it is true. Well, Dr. Thornton has himself hinted that the thing is done over and over again by theologians also, who, when an assertion on the side of Scripture is questioned, do not trouble to go themselves and find out whether this statement is really a statement of Scripture or not, but say, "Oh ! Dr. A. B. says so ; do you object to

his authority?" It is exactly the same fallacy, and I confess I do not see why the dictum of an extremely learned scientific man is to be less received than the dictum of a learned scholar. In both cases their knowledge is imperfect, they make mistakes, however learned they may be, and so there would seem to be about as much worth in the one as in the other. Again, there is the fallacy in regard to the particular interpretation which we choose to put upon phenomena, and which we regard as, in consequence, a part of the phenomena, when it is really only an inference of ours. Take an instance from Dr. Thornton's paper, about the sun standing still. It may not have entered into the minds of those present to question whether Scripture really teaches that the sun did stand still, yet it is an extremely doubtful point. The original of the word is "be silent." The sun "was silent" in heaven. It is shrewdly supposed by some (and I can find no objection to such an interpretation) that it refers, not to light, but to prolonged darkness; that there was a great storm at the time, during which stones fell from heaven, and, as an attack in the dark is usually more fatal than an attack by day, Joshua prayed that the sun might remain as it was, dark and silent; that it did so remain for the whole day, there was no light, but the battle went on in the dark, so that there was no day like that, before or after. I do not say that this is the true interpretation, but merely adduce it as an instance of the way in which what we have been accustomed to hear as the teaching of Scripture may prejudice us, and make us regard what is really a mere inference as part of the fundamental facts. Then again, there is the fallacy which Dr. Thornton notices, in the imperfect subtraction of known causes, and the effects they will produce, and the consequently fallacious reference of the remaining facts to some other antecedent. This is also constantly done by the opponents of sceptics. They say, for example, that men of science have failed to account for the deluge on scientific principles, that they are unable to show natural causes sufficient to occasion it; whence the conclusion has been jumped to—"Then the deluge was miraculous." Wait a moment. Are you certain that every cause is known which could account for it, or that, of every cause with which you are acquainted you know all the effects? I think not; but if not, then the reasoning is plainly fallacious. There are a considerable number of cases of this kind, where men jump to the conclusion that a thing is proved to be miraculous simply because not disproved to be so; in all which cases there is a liability to this kind of fallacy. I take a few instances thus (one might go through nearly all the points of Dr. Thornton's paper in this way, and parallel them with other examples), not for the purpose of dwelling upon the logical errors of defenders of Scripture, but merely to remove the impression that sceptics are more illogical than others. I believe theological scepticism has extremely little effect on the process of scientific reasoning. I can imagine a man with sceptical opinions, using a half-established conclusion, apparently antagonistic to religion, as if it were one fully proved, and this, I apprehend, is the true account of most such inconsequential reasoning; but you can hardly call this a logical fallacy, for it is not a deep-lying sophistry, but appears plainly on

the surface. With that exception, I do not think scepticism has much to do with making men of science reason illogically, and I must say, when there are so many glass windows in the houses of those opposed to scientific scepticism, that it is not wise for them to throw too many stones.

Rev. CHARLES DEANE, D.C.L.—I do not rise to meet the observations of the last speaker, although I think they are subject to question; and I should differ from him almost entirely as far as the writers of the present day are concerned. I think they are going away from authority as a rule, and seeking proofs from Scripture, rather than accepting the dicta of the divines preceding them. But I do not rise to combat that proposition of Mr. Warington, but to request you, Sir, to ask him to tell us if he can, what is the original of the remainder of that verse which he referred to, with regard to the sun standing still, or “being silent.” Our version says, “And hastened not to go down during the day.” If Mr. Warington can remember the context, I think it would help us in considering the point, whether the sun was merely “silent,” or if we must believe that the sun really stood still.

Mr. WARINGTON.—The only alteration that would have to be made, to make that verse correct, is to strike out the word “down.” The expression may be used either of the rising or the setting of the sun; it simply implies motion; and the expression “The sun was silent and hastened not to move,” would plainly suit either interpretation which might be put upon the verse equally well.

Rev. J. MANNERS.—I wish merely to refer to Mr. Warington’s interpretation of the original passage. I believe “be silent” is a literal translation of the Hebrew. Now, you could have a darkness that might prevail for any length of time, whether the sun moved or not; and there might be darkness in one place and light in another.

The CHAIRMAN.—Dr. Thornton mentioned this as showing an instance of want of logic on the part of some sceptics. “The Scriptural language on the subject is, as we might expect, popular, and not scientific, and has moreover a poetical cast.” I think Mr. Manners will find he is at one with Dr. Thornton, while he does not differ from Mr. Warington. He only mentioned an additional fallacy to the one mentioned by Dr. Thornton—a fallacy of some who support the miraculous view, without going themselves to the Scriptures to determine what the Scriptures really said on the subject. I am sure it would be great presumption on my part to discuss so learned a paper as Dr. Thornton’s, without more time to prepare for it. I can only say, that I do think,—and I differ from Mr. Warington in this,—that “The Logic of Scepticism” is a very proper title to the paper. But Dr. Thornton has by no means maintained the counter proposition, that there is nothing illogical on the part of the defenders of revelation; and surely it is valuable for thinking men to have especially set before them, what is illogical in those objections which are urged by sceptics against the Scriptures. Dr. Thornton gave a very valuable classification of these fallacies; and I think it is very important that our members, those who are not logicians themselves, should be aware of them. Many people of tender faith may find their faith confirmed, when

they are shown that that which is apparently illogical can be defended, after all, on more strictly logical grounds than the objections themselves. If I may make any further observation it is this, that the whole of the paper appears to me to prove,—and I think it will so convince those who read it,—how difficult it is to argue logically upon any subject whatever. Nothing is more difficult than a strictly logical argument ; and therefore when sceptics come forward with what may appear to be a strong logical argument, it ought to be the office of the defenders of revelation, in the first place, to examine very minutely and strictly the logic of the sceptic. If I wished to adduce an instance to show how difficult it is, even for a profound logician, to argue and reason logically upon a subject with which he is not extremely familiar, I should not have to go far for an instance. I will not take a matter with regard to revelation, but a scientific matter ; and I shall go no further than to the treatise of Mr. Mill on Logic. Very early in this, he gives as an exemplification of a strictly logical process the demonstration of the 5th proposition of Euclid, incorporating into the 5th the 4th proposition. Now, through every edition of Mr. Mill's Logic, a fallacy has been allowed to slip into this famous *pons asinorum*. I would say with all deference to the logical powers of Mr. Mill, that he has failed in passing the "Asses' Bridge!"—not because he is a bad logician, but because he was writing upon a subject with which he is not extremely familiar. If he had been extremely familiar with the methods of reasoning in Euclid, he could not have fallen into the fallacy he has. But any person who will carefully examine the mathematical demonstration of the 5th proposition of Euclid, incorporating the 4th, will find he has committed there a grievous mathematical blunder and fallacy, and I think this is a thing to caution men. Not only must a man be skilful in logical processes, but he must apply those processes to a subject with which he is familiar. That want of familiarity with a subject, though a man may be well armed with all logical processes, will cause him frequently to make a slip. I shall now call upon Dr. Thornton to reply.

REV. ROBINSON THORNTON.—It is scarcely fair to call it a reply, for I think all that has been said has been much in my favour, and has tended to bring out matters which I was unfortunate enough to leave neglected. The only remarks on which I have to make further comments will be those of Mr. Warrington. In the first place, his criticism of the title of the paper is more lenient than I should have expected ; for I am more dissatisfied with it than he is ; and the only reason I adopted it was this—I could not think of a better : every other was worse, and I took this as a *pis-aller*. I agree thoroughly with him, that there is also a lack of logic on our side, but then I remind him of this,—the Victoria Institute was founded purposely in order to prevent the believers in Scripture having this constantly cast in *their* teeth. We are assembled and associated to examine science scientifically, and not theologially, and thus to meet the arguments drawn from science against the Bible ; and the Institute is therefore a protest against that lack of logic. As regards the subject of Biblical Exegesis, I have not forgotten it ; and I must remind him that I have expressly said, "We leave to Exegetical Theology to deter-

mine what Scripture really does assert. Doubtless the Bible has often been made to say anything but what it does really say ; but the investigation of its import belongs not to philosophy." I have said this in order to point out that I have not forgotten the matter. As to the battle of Beth-horon, my explanation was derived from no less a person than Dean Stanley, who takes the view that the day was prolonged. Not being profoundly versed in Hebrew, I am doubtful of the proper translation, but upon the whole I would adopt that of Dean Stanley.

Rev. J. MANNERS.--What does Dean Stanley mean by the day being prolonged ?

Dr. THORNTON.--That the light was allowed to remain visible for a longer period than usual.

The Meeting was then adjourned.