

Reviews of *The Unseen Universe* (1875)* preserved in Tait's Scrap-book**

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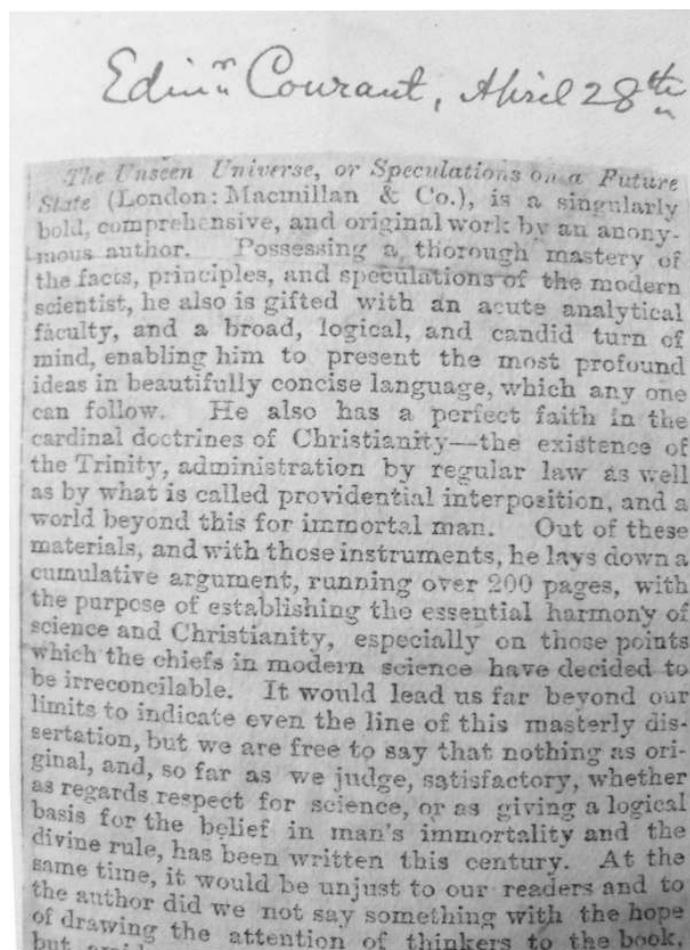
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* Stewart, B, & Tait, P G, *The unseen universe: or, physical speculations on a future state*, 2nd ed., London: Macmillan and Co., 1875.

** Housed in Edinburgh by the James Clerk Maxwell Foundation. <http://www.clerkmaxwellfoundation.org>

1 *Edinburgh Courant*—April 28, no year



but amid so much wealth of reference we must select only a point or two. One of the chief controversies of the day is whether matter be not the only objective existence in the universe, and whether all force and life are more than material phenomena. The materialist finds in matter alone all the forces in the universe, and refuses to look any farther for origin of life or other force. This writer analyses the definitions of matter, shows their inconsistency and faultiness, and enquires into its matter origin—all the while operating in a truly scientific spirit, and with the most advanced facts and speculations of the physicists, and concludes that none of them know what matter is—a conclusion none of them will deny. But he does not leave his problem in this haze, for by applying the principle of *continuity* to the case, he finds that the material universe must have been evolved from what, judged by human senses, must have been an unseen universe. The visible universe, he argues, with all its grandeur of force and wealth of form, built up of the few elements of the chemist, is destined, through the necessary radiation of force, to become effete and dead, and be again absorbed into the unseen universe, which alone is eternal, and from which it came at first. What makes this conclusion so very striking is, that it is reached by adhering to the principle of *continuity*—the specific instrument, if we may so put it, that has cut the materialist adrift from the spiritual region. By the same

process of reasoning, he concludes that the existence of the unseen universe is established beyond question, and that there is communication between it and ours. In other words, by dwelling on the forces associated with matter, materialists have denied the spiritual altogether, while this writer, by accepting their definitions of matter, concludes that something very like a spiritual universe was a necessary antecedent of the material one, and that owing to the very qualities manifested in our solar system and other material aggregates, they will again be reabsorbed into the eternal but now unseen universe. This may suffice to show that the volume is an extraordinary one, and when we further add that its author goes over almost every aspect in which his theme presents itself, both to the man of science and the theologian, we think no more need be said to send readers to the splendid illustration of analytical and other rare powers manifested in the volume. Apart from its conclusions, it is a fine summary of what is known of matter, and the steps by which those discoveries have been made. The author also works up into his thesis the latest conclusions of Huxley, Wallace, and other eminent naturalists.

*TRANSCENDENTAL PHYSICS.**

It is now some years since the systematic study of metaphysics touched the lowest point of its unpopularity in this country. The impatience of mankind at the discovery—which it had, strangely enough, taken so many ages to make—that metaphysical speculation revolved in an vicious circle led a large number of thinkers not only to betake themselves from the outset of their studies to other and more fruitful fields of inquiry, but to refuse even to take a preliminary and passing survey of the ground which had proved so obstinately sterile. In this they were wrong, as all men are wrong who neglect the history of human error. They forgot that, if mental philosophy had won little or no solid gains for man, it had bequeathed him many momentous warnings. They overlooked the fact that its value as a training was independent of its utility as a source of knowledge, and that the study of the instrument and processes of perception and thought might and, indeed, could not but have revealed weaknesses and dangers which would beset the human mind when turned outward to the world no less than when turned inward upon itself. It was doubtless imagined, however, that there was an element of practical reality about the study of physics which would protect its votaries from any dangers in neglecting that "pathology of thought" of which metaphysics supplies so instructive a record. Physicists, it was perhaps expected, would be, in virtue of their "subject," exempt from the weaknesses to which other kinds of inquirers may be liable. Like Antæus, they would be constantly reinvigorated by contact with the solid earth. We are far from denying that the expectation has been in many cases realized; but we must be permitted to doubt whether those physical philosophers who are sanest in their speculations are not so rather in spite than in virtue of their exclusive devotion to physical studies. At all events, there is evidence to prove that those studies are by no means a guarantee against another form of that transcendentalism in which pure metaphysics culminated in the earlier part of this century. The extraordinary book before us is alone sufficient to show to what heights of extravagance the *tête montée* of the pure physicist may ascend. From it we may learn that two or more savans of this class (for the "we" of the book is not the editorial plural, but stands for a plurality of authors), learned and acute in their own branch of study, and thoroughly familiar with and appreciative of the latest results of scientific research, can deliberately, and evidently after long and conscientious thought, put forth 212 pages of the most hardened and impenitent nonsense that ever called itself "original speculation." And the explanation of this strange performance—namely, the defective acquaintance of the authors with any other than physical studies—is as manifest as its character. It is a small but monstrously distended

* "The Unseen Universe; or, Physical Speculations on a Future State." (London: Macmillan and Co. 1875.)

windbag, which at a single touch from the needle of a sound metaphysic would have instantaneously collapsed.

In the meantime, however, the authors of the "Unseen Universe" ought at least to be congratulated on the imposing edifice which they have succeeded in rearing on so narrow a foundation. They start, so far as we can see, from absolutely nothing but a single postulate and a single axiom. The postulate is the existence of a great First Cause, and the axiom is what they call the "Principle of Continuity." From these they proceed to prove the immortality of the soul and its future migration to a "spiritual body," the truth of the Christian miracles and of the resurrection of Christ, the doctrine of the Trinity, and last, but not least, the eternal punishment of the wicked. Religion and science, gradually drawn towards each other throughout the volume, finally embrace at the brink of the bottomless pit—a touching reconciliation of a long-standing quarrel. When we add that the whole of the argument by which this happy union is brought about is carried on in terms of matter and force, and in strict accordance with the vortex-atom theory of Sir William Thomson, it will be admitted that the work is highly creditable to pure physics, and ought to go far to reassure the theologians who were alarmed last autumn by Professor Tyndall's unexpected leap over "the boundary of the experimental evidence," with the result of finding nothing on the other side. When, however, we come to study a little more closely the apparently unpretending materials which the authors have worked up into so magnificent a result, our surprise, we must confess, is somewhat abated. The Principle of Continuity turns out to be as "perfectly elastic" as the fluid in which Sir William Thomson's vortices are supposed to rotate. This principle, the authors tell us, is "the definite expression in words of a trust that" the great First Cause "will not put us to permanent intellectual confusion." We will not pause to consider whether this would not be more or less a work of supererogation in the author's case, so far at least as their present work is concerned, but will hasten to inquire what the phrase means. Its first application is intelligible and appropriate enough. The first instance given of a putting to "intellectual confusion"—the supposition that the sun, moon, and stars were to move about in strange and fantastic orbits for a day, and then to return to their places—is certainly a case in which it may be fairly said that the whole world (with the exception, according to his own account, of Charles Lamb, who would not have noticed the phenomenon) would be intellectually confounded. But in almost all subsequent applications of the phrase we are said to be "put to intellectual confusion" by any event or catastrophe which strikes the authors as disagreeable or disappointing, or even merely inconvenient; and to admit the possibility of any such event or catastrophe occurring becomes "a violation of the principle of continuity." Thus, though the authors admit, indeed it is part of their case, that the "visible universe

must, certainly in transformable energy, and probably in matter, come to an end," yet, the principle of continuity "demanding a continuance of the universe, we are forced to believe that there is something beyond that which is visible." The same conclusion—namely, that there is an eternal invisible universe—is founded on the fact of creation as well as on that of destruction; "for if the visible universe is all that exists, then the first abrupt manifestation of it is as truly a break of continuity as its final overthrow." We take this last sentence as a typical illustration of the mischiefs of a defective metaphysical training. The writers dogmatize on inconceivables with as ready a confidence, though with a much less excusable neglect of the fact that they are inconceivables, as a mathematician shows in his manipulations of infinity. To speak of an absolute beginning of things as constituting a break of continuity must have appeared downright nonsense to anybody who had devoted to the interrogation of his own conceptions even a portion of the time which these writers have doubtless spent on inquiries into the external world. A break of continuity—to translate the language of the "absolute," in which so much of these writers' speculations are conceived, into its equivalents in the "relative"—can only mean the substitution of a new and unexplained series of phenomena for an old and explained series; and how can such a description be applicable to the first appearance of any phenomena at all,—if we were able to frame such a conception? But the truth is that the whole speculation on this point is a mere manipulation of words.

The principle of continuity—which, so far as it is a sound principle at all, is nothing more nor less than our old friend the belief in "the persistent uniformity of natural law"—is conditioned by time like every other human conception of the same order. It has nothing to say to any question as to the infinite duration of the phenomena of whose regular recurrence these laws are the observed expression; unless, indeed, amongst the laws in question there be one which asserts the recurrence of certain phenomena *tending to their own extinction*—in which case the principle of continuity will be satisfied when that extinction has been brought about. In other words, if the theory that the transformation of energy continually tends to reduce the amount of transformable energy till at last further transformations will be impossible, and the material universe become an inert and lifeless mass, is to take rank in certainty with, for instance, the law of gravitation, then the principle of continuity will compel us to believe that the universe will ultimately undergo this fate; but it will not compel us to believe anything else. To say that the Supreme Governor must have some further views for the future disposition of the universe and its inhabitants because we should be "put to intellectual confusion" by such a lame and impotent conclusion as its destruction, is not to formulate a scientific principle, but to utter a religious aspiration.

As the whole treatise is based on this confusion between belief and hope, it would be hardly worth while to discuss it further were it not that the authors' theory of the preparation of man by purely physical means

for his new life in that invisible universe reserved for him by the principle of continuity from the foundation of the world deserves study for its singular monstrosity. There are, they say, three conceivable suppositions with reference to individual immortality. "It may be regarded as a transference from one grade of being to another in the present visible universe; or, secondly, as a transference from the visible universe to some other order of things intimately connected with it; or, lastly, we may conceive it to represent a transference from the present visible universe to an order of things entirely unconnected with it." The last hypothesis is quickly disposed of by the redoubtable principle of continuity. It would create the greatest confusion if beings "having a past entirely unconnected" with their new abode were suddenly transferred to an entirely new and original universe. So much for hypothesis No. 3. Hypothesis No. 1, which regards immortality as a transference from one grade of being to another in the present visible universe, is disposed of by the consideration, afterwards more fully discussed, that the present visible universe is not eternal, but destined to "become effete." There remains, therefore, only hypothesis No. 2—the hypothesis that immortality implies a transference from the visible universe to some order of things intimately connected with it. The problem, then, is, How is man, whose material body cannot of course survive the perishable matter of the universe, to be equipped with a new spiritual body, and yet to preserve his identity? It would be obviously useless merely to supply his soul with a new body specially manufactured *ad hoc*, after his death; because identity, as our authors say, depends upon our hold on the past—upon memory, in fact; and this hold implies a permanent organ of some sort. So universal is this proposition that the writers take upon themselves to say that something analogous to an organ of memory must be possessed by every finite intelligence, "from the archangel to the brute." Clearly, then, man must have a spiritual body in this life which grows with his growth, or at least a spiritual organ of memory, in which, as in the material and perishable organ of the same faculty, successive acts of consciousness may leave traces which will enable him in his future immortal state to retain his hold upon his mortal past. At present we have got no further than the familiar if now somewhat antiquated theory of the existence of a soul; and, if the writers had done no more than affirm that a soul exists, there would have been no great novelty in their speculations. The addition they have made to the old theory consists in their having brought the preparation of the soul for a future state under the regular operation of physical laws. This is their argument. Energy is apparently passing away in waste from the sun at the rate of 188,000 miles

a second; and other so-called dissipations of energy are constantly taking place in other ways. It is disagreeable to suppose that all this amount of a highly useful commodity is being wasted. Why not rather suppose that it is being merely transferred from the visible to the invisible world? The law of gravitation assures us that any displacement which takes place in the very heart of the earth will be felt throughout the universe, and "we may imagine that the same thing will hold true of the molecular motions of the brain." Every thought, then, which creates a displacement and motion of the particles of the brain is propagated throughout the universe—that is, into ether—that is, into the invisible world—that is, into our spiritual frames which are connected with the invisible world. Having paused for a moment to take breath after this "quick thing" in conclusion-hunting, we see that we have gained considerable ground; indeed that we have in one rush, as it were, completed our whole journey. The entire theory is thus formulated: "Each thought that we think is accompanied by certain molecular motions and displacements in the brain, and parts of these are in some way stored up in that organ so as to produce what may be termed our material or physical memory. Other parts of these motions are, however, communicated to the spiritual or invisible body, and are then stored up forming a memory which may be made use of when the body is free to exercise its functions." Thus is immortality made easy.

We despair of adequately criticising this magnificent speculation; doubting, indeed, whether we have any "organ connecting us" with its writers by which we might be enabled to do so. We must content ourselves with the following modest suggestions:—(1.) That the word "material" means "of or belonging to matter," the word "matter" itself being absolutely nothing but a name for an assumed objective cause of subjective sensations. (2.) That propositions true of material phenomena—that is, of modes of sensation referred to an assumed external cause—cannot be extended with truth, or even with meaning, to assumed existences which are not even alleged to be capable of correlation with any

sensory impressions. (3.) That the "something besides matter or stuff" which scientific men recognize as existing in the physical universe is only "beside matter" in the sense of being beyond the reach of our physical organs of perception; that in its own nature it is, and must necessarily be, conceived as "material," or such propositions as those made concerning the ether, for instance, in certain physical speculations, would involve a self-contradiction; and that therefore it must be essentially different from the mysterious fabric of which the authors' "spiritual body" is to be manufactured. And, lastly, that the authors' hypothesis, since it either assumes existences of which we have no proof, or reasons concerning proved existences in terms which involve self-contradiction, is either gratuitous or suicidal; and that, had they corrected by a due study of the history of intellectual error the tendency to mistake words for things, they would have seen that to say that thought-energy may at one and the same time displace material molecules in a material brain and immaterial molecules in an immaterial brain is to assert a proposition as inconceivable to the human mind as it would be to say that every man has a material right-hand pocket in which he keeps tangible florins and a spiritual left-hand pocket in which he puts immaterial two-shilling pieces.

PALL MALL GAZETTE.

[JUNE 27, 1879.]

THE DISCIPLINE OF PHILOSOPHY.

THE treatment of philosophical questions after a scientific method has of late years been attempted in several quarters, and with an amount of coincidence in tendency and even in actual results between independent workers which may be regarded as at least fairly encouraging. It is important that those who contribute their aid to these endeavours should fully realize how much is expected of them. The connections of psychology with physiology, and of physiology with general physics, are now clearly established except for those who wilfully refuse to see them: and the modern student of psychology must be equipped with a competent grounding in physiology, or he will very soon find himself at a loss. More than this, he must have a firm grasp of elementary physical notions. He need not be trained in the refinements of applied mathematics, nor need he even have mastered all that is to be found in such works as Professor Clerk Maxwell's "Matter and Motion." But he should know enough of the subject not to talk nonsense about it himself, or to be imposed upon by the nonsense of others. He should have learnt, for instance, to look with extreme suspicion on every statement about Force which is not capable of being reduced to number and measure. He should have acquired also, as he naturally will in learning to handle scientific ideas, a certain discipline in the exact use of thought and language. He will understand that metaphor is not argument, and have found out the danger of generalities. And when he comes to apply himself particularly to the standing problems of philosophy, he should likewise understand that philosophy, like other special studies, has its language and its history, both worth knowing something of if one means to take it up seriously. At present these conditions are but imperfectly fulfilled. Philosophy is at most in a semi-scientific stage, resembling in his respect political economy, save that it is rather the worse off of the two. There is nothing in philosophy corresponding to the nucleus of economical doctrine which is maintained by a steady consensus of competent persons and, in this country at least, is acted upon without serious hesitation. Yet we see that the crudest economical fallacies and paradoxes are every now and then gravely put forward by men of considerable general ability, and do not seem ridiculous except to economists. Much more, then, is philosophy open to confusion of various kinds, and this even in the process of trying to make it scientific.

There is obviously no remedy other than the slow but sure one of gradual education by discussion. The older branches of science have now struck root so deep that the educated public has a fairly good instinct for avoiding nonsense, at least in gross forms. No attention is paid to the ingenious persons who from time to time square the circle or demolish the Newtonian system of astronomy. In the newer and more complex branches the same process is going on, though at different rates in different countries. Political Economy is consolidating her conquests if we regard

England only, but still militant if we consider the whole of Europe. There is nothing irrational in hoping that the turn of philosophy will come, and that we may ultimately have a body of philosophical doctrine resting on such grounds of argument and evidence as may be fitted to command, and may in fact command, the general assent of competent persons. It is sufficiently obvious that we cannot expect to have it soon, if only for this reason—that the treatment of philosophical questions in the patient and impartial temper which experience has shown to be indispensable for other kinds of research is only in our own time becoming at all general. The alleged unprogressiveness of philosophy consists mainly in the fact that its progress has been deliberately hampered in every possible way in the interest of established theories and prejudices. Spiritual powers in high places, not being able to kill philosophy altogether, have at sundry times and for long times together blinded her and set her to work in a mill-round grinding out their foregone conclusions.

External constraint may now be considered, at least in Western Europe and North America, as out of the question. But internal weakness and incoherence must long cling to a study which not only is in its infancy but has been kept for centuries in a forced infancy. It loses all the benefit of a genuine scientific tradition, such as we have in the exact sciences and their applications, and to some extent in almost all the arts of life. For the tradition and the machinery for keeping it up have been seized and perverted to anti-scientific uses, and it is much more difficult to start fresh than if the ground were vacant. Repugnance to perverse methods and traditions naturally engenders a wide distrust of every sort of organized discipline; the rebound of new independence leads every man to fight for his own hand. Now the use of independence is to do your own work in your own way, but not to do it in ignorance of what the conditions of it are, and what other people have done before you. But this is a lesson which needs learning; and, having been prevented from learning it sooner as concerning philosophy, we must expect to spend some time in learning it now.

Thus a great deal of the difficulty and misunderstanding at present incident to philosophical discussion comes of pure ignorance—the ignorance of well-meaning and often otherwise well-informed persons. And this may be seen even in the work of writers who seriously intend to proceed in a scientific manner. Perhaps the commonest form of all is ignorance of the difficulty of the subject. It is frequently assumed that everybody is competent to criticize philosophical theories, and that no philosophical theory can be worth considering which is not clear at first sight to an intelligent man who knows nothing of philosophy. Take such a man and put before him Berkeley's denial of material substance and Hartmann's affirmation of unconscious will and design. He will probably say that both are absolutely and equally nonsense; and if he does he will certainly be wrong. Berkeley's idealism is not only far from being nonsense, but contains a large proportion of what is now established scientific truth. As to Hartmann's, the merit of his invention is a point on which opinions are for the present various. We should ourselves class it, roughly speaking, as nonsense, though nonsense of the most ingenious kind: but nobody is entitled to call it nonsense offhand. It is at least as rational as the so-called philosophy of common sense which was once largely accepted in this country, and is still held in a confused manner by a great many people who have just enough half-knowledge to be satisfied with it.

Again, we have ignorance of the scientific data, which is a necessary condition for the existence of much that now passes for philosophy, and also vitiates many laudable but premature attempts at philosophical construction. Ignorance must be taken to include confused thinking and inaccurate use of terms as well as complete absence of information, which indeed is comparatively harmless. A notable amount of the metaphysical rhetoric we are favoured with (sometimes from men really eminent in their own ways) depends on the misapprehension of elementary physical and physiological facts, the misconstruction of scientific doctrines, and sometimes complete mistake as to the nature and functions of scientific theory in general. Great havoc is wrought in the minds of the weaker brethren among philosophical students by scientific phrases and formulas which they do not understand. The wild and unmeaning statements that have been solemnly propounded about Force (to revert to an example already used) are alone a surprising monument of human infirmity. Professor Tait is, perhaps, austere and over-righteous in his denunciation of that unhappy word; but we should like some of the writers who confidently philosophize about the constitution of the universe to be put through a course of his lectures. For milder cases Clerk Maxwell on Heat might suffice.

Then we have ignorance of the philosophical conditions; in other words, absence of the special training required to deal effectively with philosophical questions as such. In this way it may come about that men of science give the philosophers their revenge. If it would do much good to many dabblers in philosophy to learn some physics of Professor Tait, it would have done no harm to the authors of "The Unseen Universe" if they had taken some little survey of philosophy before they blew that exquisitely coloured bubble. They were the last men in the world to be caught tripping in any point of natural science. But they had to make

a certain number of metaphysical assumptions, and they committed themselves with the utmost innocence and simplicity to the snares of common sense falsely so called. They settled offhand in a few lines questions which, as any serious student of philosophy could have told them, are extremely difficult even to state in a form calculated to lead to profitable discussion. And, in their laudable endeavours to provide man with a convenient spiritual body, they went very near to exposing themselves to the charge of gross materialism. "The Unseen Universe" might conceivably have been worked out on really philosophic lines; as it is, it must remain a mere exercise in imaginary physics. Again, the problem of Natural Theology was recently discussed by a writer who named himself only as "Physicus." We noticed his work at the time, and pointed out that, notwithstanding its power in some respects, as to its philosophical bearing it was simply out of date. "Physicus" evidently knew nothing of Kant's work in the same field; and, what is stranger for an Englishman, he seemed to know nothing of Hume's. Accordingly he spent much trouble in doing over again that which had been done once for all; and on the other hand, when he came to meet opposing arguments, dealt mostly with obsolete forms of them. But he was always quoting Mr. Herbert Spencer; and perhaps he thought that Mr. Herbert Spencer summed up everything worth knowing in all previous philosophies. This kind of fallacy is one of the most dangerous, and can be guarded against only by making the teaching of philosophy historical from the first. Just now, in looking through a little book by a writer of considerable natural acuteness, but unfortunately wanting in exactness, we find mention of the opinion that free-will is a *noumenon*. It is quoted from M. Ribot, and the writer apparently thinks that M. Ribot has invented it. For the expression M. Ribot may be responsible, but the idea is only one piece of the Kantian doctrine of the Practical Reason. But we do not mean to say that books like those of "Physicus," or other writers even of less ability who philosophize with little or no knowledge of philosophy, are at present of no use. They may do excellent service by waking up the intelligent public from the confused slumber of what they take for common sense. But the real discipline must come after them.

4 *Science Sermons for Young People*—no date

SCIENCE-SERMONS.

FOR YOUNG PEOPLE.

You will find the text in the Book of the Prophet Nature, the 1st chapter and 1st verse ; also in the last chapter of the same prophet and the last verse. The words of the text are these—*The Principle of Continuity.*

I have illustrated for you, my friends, from its natural side, the principle about whose spiritual application we are now to inquire ; but it will be well, before passing on to the consideration of continuity in

its spiritual extensions, if I restate in a sentence the subject of our last discourse. We tried to reach, by an ascending series of illustrations, the idea of physical continuity, and saw that it consists essentially in the unbroken continuance of the forces of which the ever-varying material universe is the grand result; that though the universe is continually changing in its structure and incessantly on the move, it is at the same time one whole thing held part to part in rigid sequence by the forces which, as it were, live and have their being within it—the outcome appearing to be the eternal progression of material universes. I hinted that this result had something of the windbag character, and had already received a puncture which might be serious. Is this materialistic outcome true to the principle of continuity, or does that principle demand some other and quite different extension? For us all, brothers, I hope to answer, Something quite different.

To start with, we must face some of the general questions which continuity inevitably raises for us, and the answers to which will be the object of these first talks together. This is also the place to express the probable feeling of some among you that these "Sermons" threaten to be dreadfully tough; but then, you know, the quality of toughness in sermons, like the quality of tenderness in beef, is purely relative to the masticating powers of the individual; so that the confession of dryness, toughness, and the rest *might* only mean a confession of—d'ye see? But bear in mind *I* don't suggest any such thing: no, no, I want to take you *all* with me, and therefore profess for you my entire belief that you will be true and brave, and for myself that I hope to be, well—as simple as I can. So, now that the conditions are settled, we can clear our throats all round, and settle our faces seriously, and, as the old divines used to say, "compose our minds, and begin the" task of thinking our continuity-questions out.

1st, If continuity is physical only, involving an eternal evolution of material universes, how shall Christians be able to retain their belief in a spiritual world? Clearly the ideas are incompatible.

2nd, If continuity is physical only, involving the eternity of matter, is not the belief in God denied? Again the ideas are incompatible.

3rd, If physical continuity implies the destruction of the present universe, what of the belief that "the earth abideth for ever?" These ideas also are incompatible.

4th, If continuity be physical only, what of Revelation? These ideas, too, are incompatible, and that quite apart from the denial of God.

5th, And again ; if so, what of miracles, which appear so many infractions of that continuity ? etc., etc.

Indeed, we may discern this subtle cord passed round the whole world of theological thought, and see it being rapt from our sight by the stealthy materialism, while we stand in sheer imbecility unable to lift a finger. If any one admits that continuity is physical only, he may as well have the alternatives of his admission clearly stated : and these are they. For how will he escape ? If matter is continuous from itself only, is not that saying that there is *nothing* but matter ? The principle of continuity, therefore, has either a wider extension than the physical, or else our theology is all a myth. You see I do not mince matters with you ; nor will you for yourselves, if you are prepared to follow where truth leads. Those are right who declare the issue of physical continuity pure and simple to be the eternal progression of material universes. But can continuity receive a full application in material things alone ? Would it be logically consistent and complete ? If there is nothing but matter, continuity comes to a dead halt and breakdown ; itself compels us, however, to seek its legitimate extension in other fields.

Suppose now you try to think for yourselves what continuity is, will you not tell me that it is just the dependence of one state of things upon another capable of producing it, and the oneness of the whole succession of states ? And you are roughly, but essentially, right : this is the underlying meaning of the principle, these two things, namely, *causal dependence* and *unity*. In these ideas continuity yields up its inmost to us. Again, try to answer to yourselves clearly whether it is likely beforehand that these ideas could be satisfied with a merely material extension ; and are you not bound to reply that the causal dependence and unity of mind are just as certain as those of matter ? True, say you ; but as mind is only known *in* matter, any mental extension of continuity is practically an extension of material or physical continuity. My reply is, that as the connection between mind and matter is undiscovered scientifically, there may be *two lines* of continuity, mental and physical ; but that, in any case, the principle of continuity is bound to account for the antecedents of these two lines of fact, material and mental alike ; and as these two lines become by their interdependence practically one, the true question for continuity to decide is the causal antecedent of the universe which contains them. This is the point, however, which continuity has been thought to have nothing to do with, *except* to prove the eternity of

matter; which easy assumption we altogether deny, striving to discover the true extension of the principle. And we are so far on our way as to know that continuity does not admit of a finite or limited stopping-place, nor of a break either in causal dependence or in unity. We shall understand better, as we proceed, what these statements fully mean.

(1.) What, then, is the first extension of itself that continuity demands? Its first extension has regard to *a spiritual universe*.

A material universe exists; from what is it continuously derived? Let us carefully weigh the several possible answers. We may say that it is derived from "nothing;" but, seriously, can "nothing" be a *cause*? The reply is inevitable—No. But we are in search of a state of things "capable of producing" a material universe, in search of its causal antecedent; which is *not* "nothing." Again, we may say that it came *from itself*. To this it is sufficient to reply that a thing can neither be the cause nor the antecedent of itself. Again, we may say that it came *from the used-up material of a former universe*. There is the delusive show of an answer in this, which a little reflection will dissipate as a mere begging of the question, and a shirking of the principle of continuity. The reply is manifest that the question to be decided is *the existence of a material universe at all*; and if we postulate a hundred thousand of them, continuity will still compel us to seek the cause or causal antecedent of, or that which produced, the first. It is the same, too, if any man says *there never was a first*. The meaning of this we find to be that matter is eternal, that is, it is derived from itself; so that the principle of continuity resolves itself into this, that a thing may be continuously derived from itself. Is this scientific continuity? By no means. We have seen that continuity implies *a foregoing condition of things capable of producing that which is*; and if we ask what was the foregoing condition of things capable of producing *matter*, we are told—*matter itself*! That is to say, matter is subject to the law of continuity and is *not* subject to it; matter is continuously derived from a sufficient antecedent cause and is *not* so derived: the law of continuity, in short, is true and not true—"which is most excellent conclusions!" If the principle of continuity is anything but a paper principle (and we have had it lauded for us to the skies, as if it were the God), matter, like the forms of matter, has an antecedent cause. Here, then, on the hypothesis considered, the principle of continuity breaks down, and we are called upon to admit, instead of a continuous succession of effects from

causes, an abrupt infraction and change of law in the universe, the introduction of a new principle, that of *self-development*—a mere circular thought, beginning nowhere and leading to nothing. These two principles clearly give each other a flat denial; for if the universe is self-developed, not to say self-formed, it is certainly not continuous from any cause, and if it is continuous from a cause it is certainly not self-developed. Continuity demands the existence of an adequate cause step by step backward; can it stay its backward march anywhere, and say, "Causes here cease?" But matter is either the continuation of an adequate cause preceding it, or it is not; if it is not, the principle of continuity is denied; if it is, we preserve and obey our principle loyally, and only the men of a science falsely so-called are found untrue to it.

If continuity thus breaks down under the doctrine of "matter only," what extension does it here rightly demand? What could precede matter? We need not delay ourselves with those who, like Serjeant Cox, confound atomic structure with the true "unseen," and call such matter *spirit*.

The answer, like every other first truth, appears a truism, but is inevitable. The universe of matter could only be continuously derived from some universe other than the material, yet capable of producing it. Is there any evading this reply, simple in its baldness as it seems, if we are to abide by the principle of continuity? I say, when we dare to trust our principle implicitly and make it thoroughgoing, does it not compel us to leap the barrier of matter, and lead us to an antecedent universe *not* material but co-extensive with materiality? Turn it as we will, the only rational answer, because the only one consistent with continuity, is that *a non-material universe capable of producing matter was the antecedent of the material*.

Consider now what is implied in this answer. The universe to be accounted for is *material*, therefore its antecedent is *immaterial*; and if immaterial, therefore, and for other reasons, *invisible*; but, as force and matter are *effected*, that antecedent universe is *causal* (indeed it is so by the very supposition), and, being a cause of a substantial effect, it is, though immaterial, *substantial*, *i.e.*, matter is but one form of substance. The principle of continuity thus demands an immaterial, invisible, substantial, causal universe as that from which the material universe is continuously derived. You may call this universe the invisible, the unseen, the spiritual universe—what you will: the name is nothing, the fact is all.

Is not this, then, the legitimate issue of continuity? Surely the principle demands, and is fulfilled in, the idea of a universe not material, yet substantial and causative; for, refine matter as you will, it cannot produce itself, hence its antecedent must be *immaterial*; yet, inasmuch as substance is produced, it must have resulted *from* substance, though different in kind, *i.e.*, from immaterial, or, if you will, from *spiritual substance*; and yet again, inasmuch as we are to *account for* something, we are, by the very supposition, to find its *cause*, and, having to account for a universe, must find a *causal universe*; hence the immediate cause of the natural universe is an invisible universe, immaterial, substantial, and causative: *this* the world of effects, *that* the world of causes; and the principle of continuity is satisfied.

Now, if the principle of continuity be truly followed up here it matters not in the least what objection any logical expert among you may find to bring against the position, such as that we are simply taking refuge in our ignorance in demanding a spiritual world, or that continuity would compel us to account for that spiritual world too. The reply is clear, that we have merely to resolve whether continuity is truly followed so far, and that, if so, it is thereafter just as incumbent upon our sharpshooter as upon me to question our guide further, and try to discover from him what antecedent of that spiritual universe also will satisfy his knowledge and demands; moreover, that even if he declines to answer, and we can go no further, that will not invalidate what he has told us, or dislodge us from our secure position in the spiritual unseen, as the antecedent and cause of the natural. What do you think yourselves? Will it? But there is one other point to solve in this place.

Can you tell me now whether we are bound to believe that this said spiritual universe still exists, or that it passed away in producing the physical? Let us consult our principle again. You remember that what constitutes the continuity of this physical universe is not the forms of its matter, but the continuous action of the forces present in it; you remember that? And these forces, where do they of course come from but from their cause, the spiritual universe? Yes; and are these forces still acting? But you have heard a common saying, which runs, "Remove the cause and the effect will cease;" and as the effect does *not* cease (the forces of our world, to wit), the cause remains (the spiritual universe, *viz.*, from which they come). Continuity thus demands that these forces, the continued effect in this

universe, find their continued cause in the existence of the other. The spiritual and natural universes, therefore, are co-existent.

Such is the first great truth which a legitimate extension of the principle of continuity teaches to those who can hear it, and ratifies to those already believing it—the existence of a spiritual universe. This is the last step which, according to Professors B. Stewart and P. G. Tait, modern science, to complete herself, ought to have taken, but which she failed to take, returning into herself and becoming essentially materialistic—a mere salt pillar, in fact, instead of a redeemed, glorified woman.

(2.) We must pass to a second extension of continuity in the same direction, that of causes. If continuity is physical only, what of the existence of God? Our position is, that as a first extension led us to a spiritual universe, a further extension leads us to God.

We start now with the existence of a spiritual universe, and ask to what it leads us. Some of you may unthinkingly answer, "To *another* spiritual universe;" but would not that answer be as much beside the mark as the materialist's, who thinks continuity satisfied by a succession of material universes? Consider now that what we have reached is not a universe of effects but *the* universe of *causes*, and must you not reflect that that fact throws a flood of light on the matter? If we have actually reached the universe of causes, would it not be self-stultifying to go searching *again* for causes, for further causes other than a first? Clearly *there can be no further causes to find* other than a first. Why then the need for ultimately landing in a first? Because continuity demands that having reached causes, and being logically unable to go further in that direction, these causes shall be gathered up and traced to one common origin or source; such common origin is necessarily the true Beginning or Primal Being. But *why* must these causes be gathered up into one origin? For the plain reason that if they were not so existence would stop short in a meaningless jag of loose and broken ends, and continuity would hang suspended in mid-air, like a caterpillar swinging its head from a leaf, and seeking in vain to cross the space to the next. Continuity can only be satisfied when the essential unity of the causes is made known, and when they are finally resolved into One Eternal Primal Being, the source of, and possessing, those powers of Will and Reason manifested in the universe produced by Him.

But if we have thus to come at length to a First Cause, why might He not produce the material universe directly without a spiritual

universe between? Pardoning the circular logic for the sake of the truth, I answer, Because a source of power can only effect results by specializing its activities, and the specialized activities of the Primal Power constitute the universe of causes. Without such specialized causes then, or spiritual universe, no material universe could result.

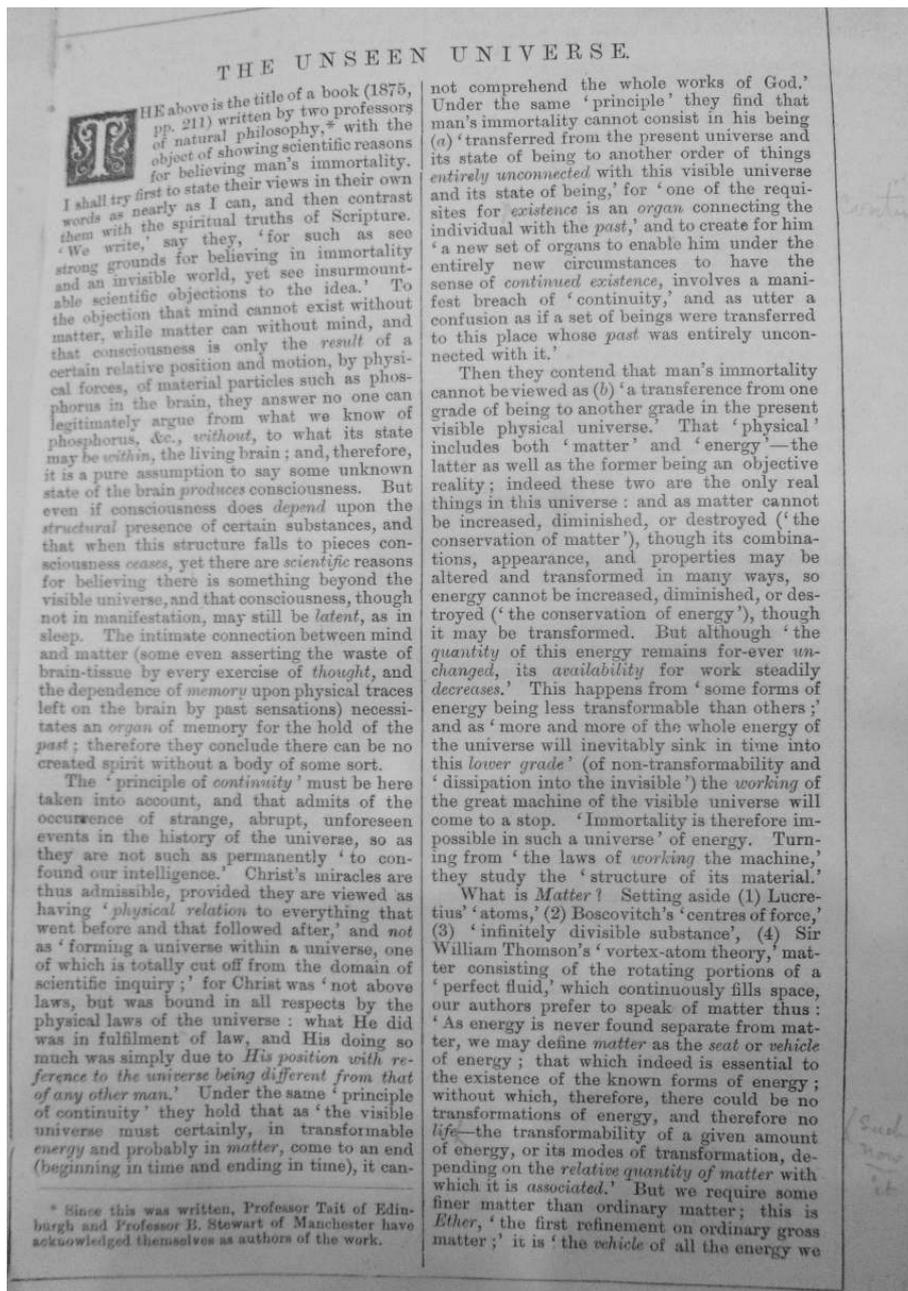
In brief, let us see the relation of the whole. Continuity demands a causal universe, the antecedent and co-existent of the material; but a universe of causes cannot itself be derived from another universe, for that would be causes producing themselves, and continuity demands the mutual relation of these in a common origin or being, the First or Supreme, of which power they are but the various specialized forms or expressions. And here continuity leaves the mind, which cannot but seek a Primal Cause, satisfied at length in the satisfaction of its deepest needs, spiritual and rational.

The question here discussed has been differently answered by two authorities. Herbert Spencer declares the cause of this material universe to be the Primal Cause; the Professors already named declare it to be an unseen universe. Why this difference? The Professors seek the *immediate* logical issue of continuity, find it in an unseen universe, and push their conclusions no further. Spencer is only content with the last or ultimate answer of the mind, and cares for nothing between. Both are right; and their statements are harmonized in the one I have now given you.

We conclude our talk at this point for the present. Other questions will engage us, but none so abstract and patience-craving as these. If of this you are glad, I confess freely that I am not sorry.

THOMAS CHILD.

5 The Christian Treasury—no date



receive from the Sun, and informs us of the nature, &c., of the bodies in cosmoical space, that 'medium of the luminiferous force, (and probably also of the electric and magnetic forces), either a fluid or an elastic solid,' susceptible of 'distortion and displacement by (gross) matter passing through it,' and this disturbance 'would be handed on as a vibratory motion with the velocity of light.' Thus 'the scientific mind is led from the visible and tangible to the invisible and intangible,' viz., Ether, which is some finer matter than gross matter, and which is 'capable of moving and transmitting the sun's energy.' How about the action of gravitation in relation to invisible ether? We see 'masses of visible (gross) matter attract one another, and apparently from a distance;' whether this force acts as between invisible particles (atoms) or between masses, the difficulty still is as to how the force communicates between the respective bodies. Sir W. Thomson's idea of atoms being vortex-rings generated, or somehow produced, out of a 'perfect fluid' filling all space, and of ultramundane corpuscles accounting for gravitation, has the objection of 'breach of continuity,' inasmuch as the atoms must be 'created in time,' for they cannot think the 'perfect fluid' capable of 'originating such a development in virtue of its own inherent properties.' They therefore prefer to 'suppose the material (visible) universe to be composed of a series of vortex-rings developed from an invisible universe which is not a 'perfect fluid,' and which 'material' will therefore be ephemeral, 'just as a smoke-ring which we develop from air is ephemeral.' This 'development' process they suppose to go on from 'primordial atoms' and combinations thereof, forming molecules at various temperatures and groups; thus originally the visible universe would be in a diffused or chaotic state—the particles of matter widely separated, but endowed with the force of gravitation or potential energy; and as they condensed or came together their potential energy was gradually transmuted into heat and visible motion; thus cooling and revolving matter in time threw off parts which formed satellites or planets, while the central mass would form the sun (Kant and Laplace); so with the other sidereal systems. Now, as these suns are dissipating their light and heat into space, and are slowly cooling, while their respective planets are by their orbital energy approaching nearer and nearer to the solar orbs, the end will be the mutual collision of all these bodies, when the visible matter, as well as all the primordial potential energy, of all the visible universe, will be evaporated and dissipated into space, and thus vanish into the invisible universe. As 'Life,' so far as it is physical, and depends upon transformations of energy, will cease with the end of the visible order of things, 'man's immortality cannot belong to the visible universe, for if on death there remain any germ or potentiality of him,' it must belong to the invisible order of things.

They conclude that man's immortality is to

be found in (c) 'a transference from the visible universe to some other order of things intimately connected with it,' viz., the unseen or invisible universe. That 'unseen' is not a future universe; it exists now; and the 'seen' is only a very small part of the whole universe; and as the 'invisible' existed before the 'visible,' so it will remain and possess energy after all the visible system has passed away; it has not changed into the present visible but exists independently now, though very closely connected with it and capable of acting energetically upon it, as indeed all the visible energy was originally derived from the unseen. Ether is both the connecting bridge between, and the cement binding, the visible order of things with the unseen, welding both in one whole universe; indeed, when energy is carried from matter into ether, it is carried from the visible to the invisible, and so also vice versa. As ether transmits motion from one part of the universe to another, it may be the medium for conveying and retaining photographs of all occurrences in the visible universe; and as molecular motions in the brain accompany thought, which also affects that organ, both thought and the organic motions may affect the invisible world—ether being the vehicle for propagating both affections throughout the universe, and so preserving memories of the past, all which may go to explain a future state. Suppose us then to have an invisible (spiritual or ethereal) body as well as a visible one (as there is an invisible world as well as a visible), and that thought partly affects the gross physical organ of memory and partly the ethereal body—where stored up it forms a memory, to be used when this ethereal body is free from the gross body and world to exercise its functions in the spiritual or ethereal world. Then, as the invisible universe will be full of energy when the present visible one is defunct, after death our ethereal body will be also replete with energy, and have eminently the power of action in that universe, retaining also a hold upon the past in the memory of past events stored up in itself, and thus preserving the two essential requisites of a continuous intelligent existence. As Dr. T. Young viewed ether, electricity, &c., as immaterial or spiritual substance, saying, 'Thousands of spiritual worlds may exist unseen for ever by human eyes, nor need matter exclude these from any spot—they may pervade matter and each other in space;' so our authors state their views as 'nearly at one with his, substituting for his "matter" gross matter, and for his "immaterial" not grossly material.' It is in this sense they speak of the spiritual or ethereal body, and say they feel 'logically constrained to admit the existence of some frame or organ, not of this ('gross material') earth, which survives dissolution, if we regard the principle of continuity and the doctrine of immortality as both true.' But 'Life' is needed for this ethereal body. What and whence is 'life'? It is a distinct thing from

'matter' and from 'energy;' neither of these can produce it any more than it can produce them; it does not belong to 'energy,' for it is not transformable as that is, seeing that 'the great characteristic of all energy is its transmutability; or passing from one form to another form;' but 'life can only be produced from life; a conditioned living thing can proceed only from a conditioned living thing.' Supposing the theories of the evolution and development of all present life from some 'primordial germ' were true, yet 'the difficulty remains, how to account for the supposed single primordial germ;' for 'it is against all scientific experience that life can appear without the intervention of a *living antecedent*:' 'matter with its forces and qualities being incapable of generating life, we must look to the unseen universe for the origin of life,' and it must be an 'antecedent possessing life that gave life to the primordial germ, an antecedent in the (unseen) universe, not out of it, and *conditioned, not unconditioned*.' Now, as the visible and tangible universe appeared in time out of the *invisible*, and will in time disappear therein, so with 'life;' their 'appearance' must be accounted for, under the rule of 'continuity,' not as a 'creation,' but as a 'development,' yet not as by a 'dead, natural operation of the invisible universe, but by means of *living intelligence* residing in that universe and working through its laws;' for the 'appearance' was of the nature of a 'sporadic or abrupt act, and the *substance* produced, or the atoms forming the material substratum of the present (visible) universe, bear from their *uniformity of constitution* all the marks of being manufactured articles' (Herschell and Clark-Maxwell); and they conclude that the '*intelligent developing agency in the unseen possesses infinite energy*.' They then ask, 'What is this mysterious, infinitely energetic, intelligent, developing agency, residing in the (unseen) universe, and therefore *conditioned*?' It is not 'the Creator, the Absolute One, the Absolute Deity, who is *above* the universe rather than works *in* it, who conditions the universe, but is not conditioned.' They claim it as the 'heritage of intelligence to be led from one form of the conditioned to another (an endless chain of a living intelligent universe, *i.e.*, one fully conditioned), never from the conditioned to the *unconditioned* or absolute, which would be to us no better than an impenetrable intellectual barrier.' 'What, then, is the 'conditioned developing agent?' They refer to the 'Christian records,' and say, 'The first Person in the Trinity, the Father, is the Creator, the Being in virtue of whom all things exist; the second Person (the Son) agreed to *develop the will* of the Father, and thus in some mysterious sense to *submit to conditions and to enter into the universe*. His work is twofold: (1) He *develops* the various universes or orders of being; (2) becomes Himself the type and pattern of *each order*; the representative of Deity as far as the beings of that order can comprehend, especially mani-

festing such divine qualities as could not otherwise be brought to light. He is King of angels and ruler of the *invisible world*; the *descent* of the Son of God through the *various grades* of existence, and the consequent a stooping on the part of a higher level; in order that there may be a *mounting up* on the part of the *developing Being*, the part of the developed.' Then the third 'living antecedent' of 'life,' and is 'in the *invisible universe*, and therefore very different from the (primordial) germ, working in this universe, and therefore *conditioned*, who distributes and develops the principle of *life* as one of the things of the universe, in the same manner as the second Person develops that other phenomenon, the *energy* of the universe: the one has entered from everlasting into the (unseen) universe, in order to develop its *objective element* 'energy;' and the third Person has also entered from everlasting into the (unseen) universe to develop its *subjective element*, *viz.*, 'life.' They conclude—'The visible universe of worlds is *not eternal*, the invisible or that connected with the *etherial medium* is necessarily eternal; both are 'conditioned' and 'the principle of continuity asserts that we can never be carried from the conditioned to the *unconditioned*; and two great laws, (1) the 'conservation of energy,' or the objective element of the universe, and (2) 'biogenesis,' or the subjective element by which the appearance of a living being in the (seen) universe denotes a pre-existence possessing life (in the unseen), lead us to an intelligent agent developing *energy*, and another such agent, whose function is to develop *life*.' On '*Miracles*' they say, 'If the *invisible* was able to produce the present visible universe with all its energy, it could *a fortiori* produce such transmutations of energy from the one universe into the other, as would account for the (miraculous) events which took place in Judea; therefore they are no breaks of 'continuity,' but only the result of a *peculiar action* of the invisible upon the visible universe; the scientific difficulty therefore disappears under our view of the invisible universe, or, indeed, if *any view* be accepted that implies the presence in it of *living beings* much more powerful than ourselves.' On '*Providence*,' they say, 'We can appreciate only *general laws* of action—the working out of these on *individual interests* we cannot explain.' '*Heaven*,' they say, 'expresses the Christian's sense of relief from sorrow and death, and his joy in the presence of Christ; in fine, our relations to *time* and *space* will then be greatly altered and enlarged.' '*Hell*' is 'not figurative,' but 'continuity requires its literality in a Gehenna of the universe, where all its garbage and filth is consumed, and with an *enduring process*; for we cannot agree with those who would *limit* the existence of evil to the present world; the dark thread of evil is very deeply woven in the *whole* universe, which, after all, we regard as *eternal*; so we view evil as eternal, and we cannot

imagine the universe without its Gehenna, where the worm dieth not,' &c.

If all this be meant for anything more than an intellectual soap-bubble or 'smoke-ring,' blown from an ethereal pipe into ethereal space for the admiration of scientific beholders, then it is interesting as expressing the actual views of some physical philosophers on the subject of 'immortality.' I think I have fairly stated the argument of the book, and sufficiently for the consideration of ordinary thinking readers. Even such readers might claim to question many of the scientific points dealt with, when they find so much made of theories concerning *atoms* and *ether*; things which such modern masters of physical science as Davy and Faraday *denied*, the latter objecting even to the use of the term 'atom.' One shrinks, however, at the outset from the bold assignment of certain particular work in this creation to each Person of the Trinity, viz., that the Father 'creates' all, while the Son and the Holy Ghost 'develop' all, the *former* developing the 'energy,' and the *latter* developing the 'organic life' of the universe; but 'what' or who develops the 'matter' of the universe, we are not told. Why should 'continuity' require that God shall become 'conditioned,' in order to 'develop,' though not to 'create,' the ethereal elements, &c. ? Even the old idea of evolution going on by virtue of forces given in the original creation is not so objectionable. It is, however, enough to say there is no Scripture warrant for such allotment of agency and work, and it is safer to abide by the simple statements we find in the Bible as to the creation.* But surely it is worse to assign *organic life* to God; not content with attributing such life to the angel-spirits along with ethereal-material bodies (utterly without scientific evidence, as without warrant from Scripture), the same seems to be applied to the 'everlasting God.' First, God the Spirit and God the Son are 'conditioned' in the unseen material universe; then that unseen is 'developed' into the seen or gross-material universe by '*being* intelligence' residing in the unseen or fine-material universe; and, lastly, as 'life can only be produced from life, a conditioned living thing from a *conditioned living thing*, we must look to the unseen universe for the origin of life, and it must be an antecedent *possessing life* that gave life to the primordial germ.' As life is declared to be never apart from *organism*, it follows that the 'infinitely energetic, intelligent *living* and conditioned developing agency' has an ethereal, eternal organism of some sort. Our authors really seem to suppose that the terms 'life' and 'living' in the Scriptures always mean *organic life*. The 'living God,' the 'living Father,' Christ 'the living bread,' the Spirit 'the living water'—can any Bible-educated one possibly imagine or believe that this means

* See Genesis i. (note verse 2); Psalms xxxiii. 6; Jeremiah x. 12; John i. 1-3; Acts. xiv. 15, and xvii. 24, 25; Ephesians iii. 9; Colossians i. 16, 17; Hebrews i. 2, 3, 10, and xl. 3; Revelation iv. 11.

some kind of organic life, connected with some refined material organism? From Revelation we know God is Spirit, as Father and Son and Holy Ghost, and when spoken of as 'living,' it is in a spiritual sense, as conscious, active, personal Spirit, and apart from any form of physico-organic life or mental-moral life. He created angels as living spirits, and man as living spirit (in intelligent animal nature for temporal earthly abode); some of the angels fell and are spiritually dead, i.e., 'dead in sin;' and all men likewise fell and spiritually died, 'dead in trespasses and sins.' To quicken, to give spiritual life to these dead ones of the human race in the present visible world, the 'Prince or Author of life' (Acts iii. 15.) visited our earthly abode, then taking our (sinless) nature, including organic life. But there is not the slightest reason to suppose that organic life is or can be in the *spiritual* world, or that anything can be eternal except spirit and spiritual life. It was that 'Lord of life and glory,' who was 'in the beginning as the Word with God, and He was God, and all things were made by Him; in Him was *Life*, and the *Life* was the Light of men; who came, as the Word made flesh (human nature) to His own, and His own *received* Him not; but to as many as *received* Him He gave power or title to become the sons of God, which were born not of blood, &c., but of God.' He is Himself spiritual, personal *Life*, and becomes the *Life* of His redeemed ones: 'As the Father hath *Life* in Himself, so hath the Son *Life* in Himself;' 'the *Life* was manifested; and we have seen it, and show unto you that *Eternal Life*, which was with the Father, and was manifested unto us;' 'In this was manifested the love of God toward us, because that God sent His only begotten Son into the world, that we might live through Him;' 'God hath given to us eternal life and this life is in His Son, he that *hath* the Son, *hath* life, and he that *hath not* the Son of God *hath not life*; these things have I written unto you that believe on the name of the Son of God, that ye may *know* that ye *have* eternal life;' 'and we know that the Son of God is come, and hath given us an understanding to know Him that is true, and we are in Him that is true (or Truth), even in His Son Jesus Christ: this is the true God and *Eternal Life*.' It appears, then, that this heavenly, spiritual, personal 'Truth and Way and *Life*' came to give those who were already possessed of organic life and mental life another life, even the *life* of God, to quicken into a *life* of holiness that spirit (John vi. 63) which was dead in them *through* sin and *in* sin, to bring that which was *lost* into the *living way* of God, to make that which was captive to lie free to abide and be nurtured in the *truth* of God. Hence our Lord declares, 'As the Father quickeneth, even so the Son quickeneth whom He will. Verily, verily, I say unto you, he that heareth My Word and believeth on Him that sent Me *hath* everlasting life, and shall not come into condemnation, but is *passed* from death unto *life*. I am the

Otherwise, plant-immortality will haunt your theory, brute-immortality will dog your steps, until you are fain to fly from such phantom-salvation as refined 'matter-energy-life,' affords, to the Personal Saviour, who alone is that spiritual eternal Life in whom our spirit can live, that eternal Truth to sustain our spirit, that everlasting Way for our spirit holly to move and act in.

Weigh the terms in which man's creation is announced, and you will see it is very different from that of plant-life or animal-intelligence; for, in addition to all that, he is spirit-breathed, with a spiritual, personal nature like to angels, like to God, and will return in like personality to God*—this is man's true 'continuity.' It is this self-conscious, spiritual, personal nature in man which is spiritually immortal, and which must obtain 'living immortality' in holy perfection from and in Christ our Lord, or remain a fallen and 'dead immortal' in *sin* for ever (John viii. 24). The living one even here and now lives a 'life of faith in the Son of God,' and 'Christ lives in him,' so

* Genesis i. 26, 27, and ii. 7; Job xii. 10, and xxxii. 8; Psalm xxxiii. 6; Ecclesiastes xii. 7; Isaiah xlii. 5; Zechariah xii. 1; John xx. 22; Hebrews i. 7, and xii. 9.

that 'the life of Jesus is made manifest in his mortal flesh' in all holy goodness and virtue; and when death comes, and the spirit is 'absent from the body and present with the 'Lord' in the spiritual world, he is with 'the spirits of just men made perfect, and an innumerable company of angels, and God the Judge of all, and Jesus the Mediator of the new Covenant;' and there is the spiritual 'holy Jerusalem;' and the Lord God Almighty 'holy Jerusalem;' and the Lamb are the temple of it, and the glory of God lightens it, and the Lamb is the light thereof; and the redeemed shall be 'joint-heirs with Christ, and inherit all things, and reign with Him,' and shall receive 'crowns of life' and 'crowns of righteousness' (or living crowns of righteousness), and be 'blessed in being called to the marriage supper of the Lamb,' and be so closely allied to God as to be called 'the Bride, the Lamb's wife.' They shall also have a blessed part with their Lord in His 'second coming' at the 'first resurrection,' when He will be 'admired and glorified in His saints,' and they with and in Him, when He shall 'subdue all things to Himself,' and 'restore all things' to pristine perfection where He and His people suffered, and make it, for the appointed time, the abode of 'righteousness unto holiness.'

E.

THE DAILY REVIEW, FRIDAY, MAY 7, 1875.

MATTER AND IMMORTALITY.

THE UNSEEN UNIVERSE: or Speculations on a Future State. London: Macmillan & Co. 1875.

HERE is another attempt to penetrate the mystery of the existence of Matter, Life, and Man, and this is its sum—a pre-existent Unseen Universe developed into a gross universe “of stuff or substance,” in strict accordance with the principle of continuity, “that principle which has been the guide of all modern scientific advance.” Opening the book at page 74, our eye rested on the following—“Conservation of Momentum,” “Conservation of Moment of Momentum,” “Newton’s First Law of Motion—Action and Reaction are Equal and Opposite,” and we thought of the weighty warning of the foremost of plant physiologists, Schleiden. Mourning over the tendencies of his speculative countrymen to go outside of their speciality and intermeddle with all things under the sun and above it, he says:—“The first rule which the exact investigator of nature should observe is, that he should not allow himself to pronounce an opinion, either in affirmation or negation, on subjects which do not fall and cannot fall within the sphere of his observation and experience. What astronomer, for instance, would take upon himself to deny the existence of Tantalum or Lanthanum? Yet Spirit Free Will, God, come as little within the domain of any possible experience of the natural philo-

sopher. How then can he be competent to pronounce about them? If the natural philosopher comes, not in his special capacity, but in that of man merely, to speak of these matters (as every man has a right to do), then he must have before his eyes the second rule, which is, that he must not pass opinion, form his judgment, nor utter it, upon matters of any science to the present level of which he has not brought himself"—(*Ueber den Materialismus*, W. S. W., Leipsic, 1863). Had our author respected the second rule, and given a place to the science of theology under it, his views of many passages of Scripture quoted would have been somewhat different.

It will clear the way for subsequent remark, if in the outset we indicate, in a very general way, the scope and nature of the solution of the great problems here dealt with. In the depths of the past eternity, mayhap millions of ages antecedent to the millions assigned by Darwin to the origin of his famously fertile primordial germs, there was an unseen universe, and, previously, we suppose, a Deity, though the use of the word "things" on p. 47, and Herbert Spenser's "Power Incomprehensible," in the same paragraph, make the precedence doubtful. There was a Deity and a universe subject to the principle of continuity. Out of the invisible the visible universe was developed. But that which has become must continue, for annihilation is scientifically impossible. The unseen universe

seen. (By the way, is not Tyndall more sternly logical here, when he says:—"The law of conservation rigidly excludes both creation and annihilation"?—(*Heat as a Mode of Motion*). Our present order of things is growing old and decrepid. A prodigious dissipation of energy is going on, which, however, let us be thankful, is not lost but is received into the all-pervading ether—the true-blue connective medium between the seen and the unseen universe. It is held not improbable, certainly not impossible, that through this medium even the "stuff or substance" of our world may, at a point incalculably far down the ages, be rendered back into the unseen, whence it was originally evolved. Here the hypothesis hooks on "immortality." Science and Scripture alike bear unmistakable testimony to the truth that the present world has had a beginning and will have an end. It is not then fitted to be an abode for the immortal soul. This is even now found in the unseen, and as the unseen will abide the abode will be everlasting. The author holds that these considerations are fitted to clear away many of the doubts of thoughtful men as to the immortality of the soul. He holds, moreover, that there is room for Christianity inside the circumference of his hypothesis. In support of the latter belief he quotes

hypothese.
he quotes many passages of Scripture, whose value, however, may be estimated by the meaning he evidently assigns to 2 Cor. iv. 18 :—"The things which are seen are temporal, but the things which are not seen are eternal." He gives a prominent place to this passage, in the belief that it covers all the past, as well as all the future, whereas it embraces only the objects of an afflicted soul's hope, as one "delivered unto death for Jesus' sake," and yet "knowing that He which raised up the Lord Jesus shall raise up us also by Jesus," and give us those things which are unseen and eternal. While we have no wish to detract from the author's (or authors') claims to originality, we cannot help recognising the ring of old familiar voices, once and again, throughout these pages, which recall the metaphysics of Aristotle, "the master of the sapient throng;" his views of substance (*ousia*) existing as possibility (*dynamis*); of change as the passage of potentiality into reality; of the perfectly moved and that which both moves and is moved, and of that which is not moved, but is always imparting motion—the Immaterial and Eternal Form, the pure Actuality, the Absolutely Perfect, back to whose image all things seek to come—God. Then there was the favourite starting point of ancient hylozoism, the existent ether, the essence, or life, of matter. On this all its expounders were agreed :—

" Democritus
Who sets the world at chance, Diogenes,
With Heraclitus, and Empedocles,
And Anaxagoras, and Thales sage,
Zeno, and Discorides well read
In Nature's secret lore."

They differed only at the first step in "the continuity." One said that out of the ether came moisture, another water, another air, and another fire. It is fitted to startle many to find a modern physicist, manifestly of great accomplishments, working virtually in the line of these old-world speculators, and bringing to bear on their views, and views kindred to theirs, the illustrative power of highest attainments in recent physical science. Yet most will sympathise with the attempts here made to set science in such lights as will enable her to dispel doubts, and not beget them, whatever view we may come to have of the intrinsic worth of the attempts. Could we imagine a man set solitarily and suddenly, with all his faculties mature, amidst the works of nature, would not his desire to know take form in definite questioning? What am I? Whence have I come? Whether am I going? For whom or for what am I? What means all I see around me? Had these a beginning? Will they have an end? Had no voice from heaven spoken in the heart of the first man these, no doubt, would have been his questionings. Indeed, in the experience of many still such questions shape themselves as definitely. And though they are the fruit of many and varied conditions—as Christian heredity, so to speak, early training, education, reflection, and the like—they frequently come as by a sudden spring on thoughtful men, and imperiously de-

mand a speedy answer. But these men have a history. They do not stand alone, but in a multitude like themselves, with environments, physical, intellectual, moral, which have had much to do in fashioning individuality, and in determining the bent and nature of the questioning. Neither they nor those who attempt to satisfy them are free from bias, for even the most impartial of men cannot, like light, pass through a tainted atmosphere and take no harm. When the difficulties are such as our author deals with, and when they are sought to be removed by a scientific man by drawing materials avowedly from two sources—science and Scripture—preliminary to such discussions, there are several important considerations to be settled. 1. It should be made clear how, consistently with true method, the question of origin of matter and life can ever legitimately become a scientific one. 2. When quotations are made from the Bible in support of scientific statements, on other than questions of origin, reasons should be given for rejecting its authoritative declaration on that of origin. 3. As great dubiety exists as to the import of the term "force," which bulks so largely in such matters, it should be shown in the outset whether vital and physical force are held to be different or identical. This is the more necessary, seeing that one illustrious physicist has put his views very plainly thus:—
"It is the compounding, in the organic world, of forces belonging equally to the inorganic, that constitutes the mystery and the miracle of vitality."

We have weighed the author's statements, page by page, with much deliberation and care, and would like to have remarked on the attitude of "the unwilling disbelievers," who are manifestly waiting till they can become "as gods, knowing," and whose disbelief is irrational, rather than unwilling. There are the hesitancies also of the large class who have more dinners, intellectual and material, than appetites, and who would be saved a good deal of doubt, and would lessen the demand for books of this sort, if they had some hard honest work which they were compelled to do. We think the author gives undue respect, in his comparison of the universe to a great steamship, to the men who go below and examine the machinery, making out, of course, that the ship can take them no further than the next port—death, we suppose. They form deliberate opinions on purely mathematical grounds, and looking at the machinery, very nicely calculate the rate of frictional waste. We are sure that, even to them the revelation of an Unseen Hand freely oiling the whole would not alter their dear convictions. It would simply suggest to them the further question, how far the oil modifies the waste. Then why should speculators be ranked in two great classes only—the men who ask "how?" and those who ask "why?"—the men of science and the men of religion. There are many scientific workers who reverently, lovingly, and with faith, as of little children,

meditate on the "why," and find the answer in another quarter than their science, however dearly they may love it. Disbelievers we are assured are increasing. We are sure the numerical proportion of this class to the higher minds of the country who know what faith means, is not greater than at former periods. This cry of "fire" at the door of a great argument is rather sensational. In the reference to the beliefs of the ancient Egyptians, we think the true significance of the existence of the belief in the unity of God, as an esoteric doctrine, has been missed. It was no more than the presence in Egypt at that time, as in India and China still, of a testimony to the persistency of traces, even in nations otherwise fearfully polluted, of original primitive monotheism once universal in the world. This might be largely illustrated. We had intended to point out what seems to us grave defects in his views of the teaching of Christianity on the matters in hand, of miracles, and of development, but our notice has extended too far already. Turning to the crucial part of his hypothesis, we have to confess that, notwithstanding a strong desire to find in it the deathblow of materialism, we have laid the work aside with an uncomfortable impression that, while the author's views seem fiercely hostile to gross materialism, there is a refined sort with which they may consist—if not countenance. An hypothesis which has room in its embrace for Christianity and Darwinism should be looked at on all sides. We have attempted a little, and done far less than we aimed at, but we may return to the work for closer criticism on the merits.—Clement of Alexandria describes the contrast between the grandeur of the way of approach to the Egyptian deity and the deity itself when the sanctuary was reached:—"The god you sought is not there, but a cat, or a crocodile, or a serpent sprung from the soil, or some such brute animal which is more

sited to a cave than a temple. The Egyptian deity appears—a beast rolling himself on a purple coverlet." The argument of this book is massive and able. Its illustrative matter is like the argument itself. You get to the end, you see the purple coverlet, and on it "Continuity conserved." This is all. We lay "The Unseen Universe" aside, thinking of Oken's suggestive creation-formula + 0 —.

The Echo.

FRIDAY, JUNE 11, 1875.

The Unseen Universe; or, Physical Speculations on a Future State (Macmillan).—The aim proposed to themselves by the authors of this work is to prove to those who have no definite belief in the immortality of the soul that this faith is "strictly in accordance with the principle which has been the guide of all modern scientific advance, that of continuity," and that the Christian scheme "gives a more complete and continuous explanation of the visible order of things than one which proceeds upon the assumption that there is nothing else." In this respect they liken it to the hypothesis of atoms, or that of an ethereal medium, for neither of which we have the direct evidence of our senses, but which have, nevertheless, been adopted, as affording the best explanations of the phenomena of the visible universe. Regarding the doctrine of immortality, they say:—"The evidence in favour of the doctrine is not derived from us. It comes to us from two sources; in the first place from the statements concerning Christ, and in the second place, from that intense longing for immortality which civilised man has invariably possessed." A materialist who will receive "an intense longing" as evidence of anything is, we fear, a creature of the imagination. Meantime, the depth, originality, and earnest purpose of this work commend it to attention.

THE EDUCATIONAL REPORTER.

JUNE, 1875.

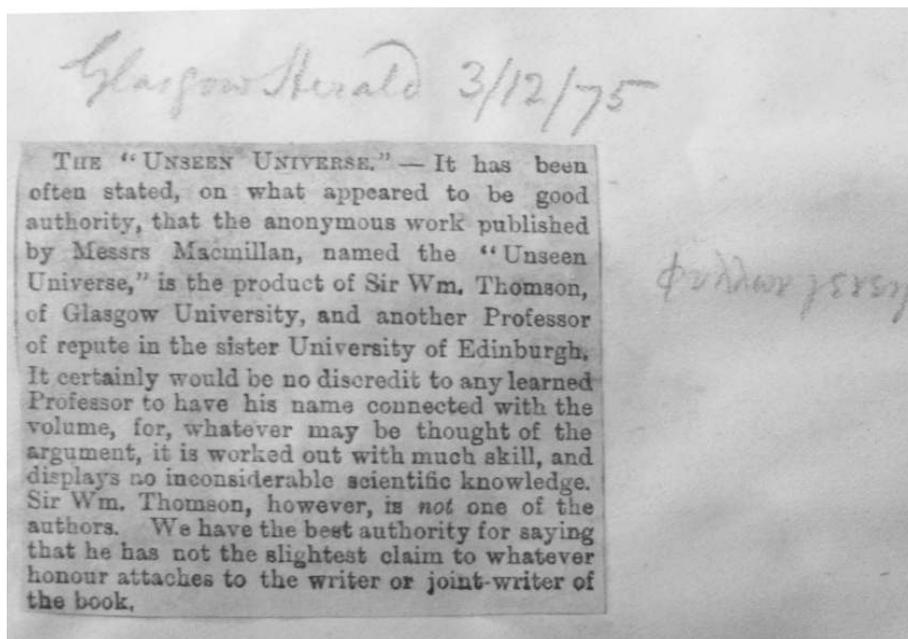
“THE Unseen Universe ; or, Physical Speculations on a Future State,” although published anonymously is ascribed to Prof. P. G. Tait, and Dr. Balfour Stewart, and the strength and precision (speaking generally) of the writing, the thorough knowledge of the highest and most recent developments of natural philosophy possessed by the writers, as well as the harmony of the views herein enunciated with similar ones published by one of the gentlemen named,—all these things conspire to render the ascription credible. To give an intelligible account of the argument of the volume would require more space than we have at our disposal, and we will only add that the work is pervaded by an earnest religious spirit, the authors believe “that the Creator of the Universe is himself the Author of Revelation,” and decide in favour of Trinitarian Christianity.

THE FREEMAN.

JULY 21, 1876.

The Unseen Universe. By B. STEWART and P. G. TAIT. Fourth Edition, Revised and Enlarged. Pp. 271. London: Macmillan & Co. 1876. Many of our readers are no doubt acquainted with the earlier editions of this well-known work, which in its present form is sure to win the attention of a wider class than heretofore. The distinctive features of the new edition are (1) the avowal of the authorship by Professors Balfour Stewart, of Owens College, Manchester, and P. G. Tait, of the University of Edinburgh; (2) an introduction of considerable length, which aims to remove misapprehensions as to the design of the work, and to answer the more important objections that have been urged against it; and (3) a revision and enlargement. The introduction and additions are so weighty that all who are interested in the subject will naturally desire to become acquainted with them. The design of the

book is one that must command the sympathy of all Christian men—viz., to point out from a purely physical point of view the possibility of belief in a personal God and in an immortal life. The argument rests on an absolutely scientific basis, and is intended to appeal to those who cannot accept these doctrines because of the strong objections urged against them in the name of science—objections which they do not see how to surmount. Our authors believe that they can be surmounted by the aid of science itself. The principle of continuity, supposed to be so adverse to our Christian faith, is here pressed into its service. It is, our authors urge, monstrous to contend that the whole universe will come to an end, while, at the same time, they aver that the visible universe certainly must, in transformable energy, and probably in matter. By the principle of continuity, however, we are compelled to believe in something beyond the visible—another and higher order, which will remain after the present system has passed away. And in this fact there is ample warrant for the faith inculcated by the Scriptures. Professors Stewart and Tait are reverent students of the Scriptures, and what they have written may certainly reassure us as to the issues of the conflict which is being waged so fiercely between “science and religion.” In fact, they have rendered a service of inestimable worth in exemplifying the spirit in which the advocates of the two sides should approach each other. Whether their argument will be deemed conclusive by those who do not believe in immortality on other than scientific grounds, it is impossible to say. We cannot ourselves accept their theological standpoint. With very much that they have said against hard, harsh dogmatism we fully sympathize, but here and there they are unnecessarily severe on theologians, who, as a class, are quite as tolerant as their scientific opponents; besides which, their views on the Trinity, for example, do not appear to us to be in harmony with the teachings of the New Testament. Their interpretations, though exceedingly ingenious, are strained. The work, however, is immensely valuable, and must prove helpful to those who have been perplexed by the distracting influences of “modern thought,” and for this reason we cordially commend it.



The Globe - April 30th

"THE UNSEEN UNIVERSE, OR PHYSICAL SPECULATIONS ON A FUTURE STATE" (*Macmillan*).—The world has heard a great deal of late of the antagonism between science and Christianity. Since Professor Tyndall delivered his bold manifesto at Belfast, every tyro who has taken up with "advanced" opinions thinks it his duty to shock as much as possible those who maintain the creed of their forefathers. The present work is an attempt to prove that science, properly understood, not only is not antagonistic to, but supports, the main Christian doctrines. The belief which the authors chiefly deal with is that of immortality, but they claim for their principles a significance which renders them applicable to other convictions of not less importance. They do not, like some advocates of religion, start by denying many of the more prominent conclusions and theories of modern science. On the contrary, they accept the latest and most audacious speculations as to the constitution of the universe, and make these the basis of their system. The fundamental principle from which they start is the law of continuity. They will not admit that there is anything in the Cosmos absolutely abrupt or beyond the range of law. Take any phenomenon, and, they maintain, if you push back you will find that it is connected with another, and that again with another, and so on through an infinite series, each change occurring according to a fixed order. This doctrine compels them to deny a sudden creation of the world from nothing. They trace it to an intelligent First Cause; but, they argue, He evolved the visible from an invisible universe, and that invisible universe still exists, and is regulated by its own laws. As an approximate statement of the mode of this development they speak favourably of an hypothesis of Sir William Thompson, "which regards the primæval atoms of the visible universe as vortices somehow produced in a pre-

existing perfect fluid"—an hypothesis which they improve by conceiving the pre-existing fluid as imperfect. The laws of energy are discussed; the latest views of the ultimate constitution of matter are presented; and then the authors proceed to consider development under the three heads of "chemical or stuff development," "globe development," and "life development." Their investigations on these matters lead them to a conclusion which has been recently urged by many scientific men, that the energy of the visible universe will ultimately be dissipated, and that even the matter of which it is composed will perhaps disappear. But this energy will not cease to exist. It is now, in fact being stored up in the invisible universe from which the visible sprang, and will be available for new uses when every trace of the present state of things has vanished. The medium by which energy passes from one world to another is the interstellar ether by which light is transmitted. Inconceivable amounts of working energy are apparently lost in the process of transmission; but the authors deny that there can be such a thing as real loss of energy. Such loss would mean the abolition of the law of continuity, which is at the root of all our reasonings with respect to past and future. Applying all this to immortality, it is plain that if man is immortal he cannot be so in the visible universe. That will itself perish, and all who are of it and related to nothing higher must perish with it. Their contention is that man only partly belongs to the visible; and at this point their speculation becomes, whatever may be said of its value, at least curious. They admit that thought is associated with molecular action in the brain. But they assume that man has a spiritual as well as a material body. The molecular action in the brain does not stop with the outward world; like all other

molecular action, it affects the all-pervading ether, and through this an impression is made on the spiritual body. Thus impressions are stored up, and when the outward body dies the inward life goes on, and there is a distinct memory of the past and the power of action in the present. To this spiritual body it matters nothing that planet crashes into planet, system into system, and that at last the fire of external existence is burned out. It belongs to a different order of being, and continues its life under fresh conditions, remembering the career on this planet, but only as one stage in an endless progression. It is easy to see how the fundamental principles of the book are applied to other doctrines. Miracles, for instance, are considered as violations only of the laws of the visible universe, not of the universe in the largest sense, since they were in accord with those of the invisible universe, and due to the action of powers belonging to it. The authors also take up the question of creation, and endeavour to show that the scriptural statements on the subject are borne out by their theory. A great many objections will occur to any one who reads the work with any attention. It will be felt, for instance, that the authors are much too vague in their definitions of what they mean by the invisible universe which gave birth to the visible, and which still acts upon, and is acted upon by, the visible. Again, their hypothesis of a spiritual body is a somewhat large demand to make without proof. To this they may reply that their object is only to suggest an hypothesis by which immortality may be reconciled with physical science; but even in that case they were bound to say what they think a "spiritual body" is, and, besides, it

is evident throughout that the hypothesis is one which they present as likely to be true to facts. The strictly philosophical parts of the book are not nearly so able as the strictly scientific. They dismiss the Berkeleyan theory of matter in a manner that shows the authors to be ignorant of the element of psychological inquiry. These drawbacks, however, do not detract from the value of the work as an attempt to grapple with the greatest questions with which the human mind can deal. Even if it does not convince any one already sceptical or confirm a faith already strong, it is at least highly ingenious, and contains, apart from its peculiar views, many clear expositions of scientific truth.

THE UNSEEN UNIVERSE; OR, PHYSICAL SPECULATIONS ON
A FUTURE STATE.

The Rev. Malcolm MacColl writes to the *Guardian* :—

“ Sir,—Under the above title a very interesting and remarkable volume has been published within the last few weeks by Messrs. Macmillan and Co. I trust that your readers will not deem me impertinent for presuming to call their attention to it.

“ The authors (for the book, which is anonymous, is avowedly the work of more than one writer) start from a purely scientific basis, and build their argument, step by step, on the established facts of physical science. And the conclusions to which their argument conducts them may be stated briefly as follows :—

“ The evolution of the visible universe out of the invisible by the operation of a triune God, and its dissolution and absorption into the unseen universe in process of time.

“ The immortality of the human soul and the framework of a spiritual body within the present material and perishable body.

“ The probability that some at least of the mighty operations of nature are the work of angels.

“ That miracles are not inconsistent with any of the established facts of physical science.

“ The result at which the authors have arrived is thus stated by themselves :—

Our readers are now in a position to perceive the result of questioning science in this manner, and of abandoning ourselves without mistrust or hesitation to the guidance of legitimate principles. It is that science so developed, instead of appearing antagonistic to the claims of Christianity, is in reality its most efficient supporter; and the burden of showing how the early Christians got hold of a constitution of the unseen universe, similar to that which science proclaims, is transferred to the shoulders of the opponents of Christianity.

“ The authors are clearly not amateurs in physical science. They are evidently masters of their subject, and it is as scientific men, not as theologians, that they write. To me the book has the additional attraction of confirming some speculations of my own in a recently published volume. But it will, in any case, repay a careful perusal.”

THE GUARDIAN, JUNE 23, 1875.

The Unseen Universe; or, Physical Speculations on a Future State. Macmillan.

This book is one which well deserves the attention of thoughtful and religious readers. But the title may very likely suggest false impressions, and frighten away some who would derive both pleasure and instruction from its perusal. We hasten therefore to say that it is not a "spiritualist" book, that it has nothing to do with table-turning, or rapping, or planchette writing, or "levitation," but that it is a perfectly sober inquiry, on scientific grounds, into the possibilities of a future existence. Perhaps, indeed, we might go further, and say that it is an attempt to bring religious and scientific conceptions into harmony generally; for though the one point to which the argument is professedly directed is the immortality of the soul, it embraces so much by the way that it may almost be regarded as a treatise on the relations of Matter and Spirit, of the Seen and the Unseen, of Theology and Philosophy. These are topics on which many writers try their hands; but the distinguishing feature of the present book is that its authors—they are anonymous, but the Preface implies that we must speak of them in the plural number—are quite familiar with the most recent and the most abstruse physical speculations. Their knowledge of the theories of the ultimate constitution of matter propounded by Sir W. Thomson, Prof. Clerk-Maxwell, and others, as well as of the theory of Evolution, as developed by Mr. Herbert Spencer and his disciples, is real and intimate, and not—as is too often the case in books of this kind—picked up second-hand and imperfectly apprehended. They are completely masters of this part of their subject, and, what is still more remarkable, they accept and maintain in all its broad outlines the current physical philosophy of the day; but they believe that they have discovered a method of regarding it, which will bring it into perfect harmony not only with the doctrine of the Immortality of the Soul, but also with those of the Trinity and the Incarnation, of Heaven and Hell, of Angelic Manifestations, and of Miracles.

The reasoning by which this method is established is, as might be expected, abstruse, and the method itself is evanescent and hard to grasp. No one can fairly appreciate it without reading the book carefully, which, considering the nature of the subjects it deals with, is neither long nor difficult. Some acquaintance with the scientific objections it meets is indeed presupposed, for it would not be possible to exhibit them effectively within the given limits of space to persons who were before entirely ignorant of them. But few readers even of the lighter literature of the day are in this condition; and the general knowledge, which is as it were in the air, for all those who are interested in such topics, is sufficient to enable them to understand the general drift of the argument.

It runs something in this way:—The authors adopt to the full the great principle of Continuity, which was first enunciated by Sir William Grove in his inaugural address to the British Association at Nottingham, and which has since received considerable development from subsequent writers. This principle requires that the Universe should be regarded as one great whole, with all its parts linked together by insensible gradation. It especially excludes the idea of the intervention of the Creator from time to time by repeated acts of individual creation. All things must be so arranged that worlds may give birth to worlds and species to species by processes of natural law, which are in fact nothing more than the steady expression of the unchanging Will of the Creator. A complete theory of Evolution is, of course, simply another statement of this doctrine. Our authors hold it as proved that the solar system—and therefore probably all other systems—took their origin in a condensing nebula. They adopt Mr. Herbert Spencer's formula that Evolution proceeds by the integration of matter and the dissipation of motion. They hold his doctrine of the adjustment of organisations to their environment; they take for granted the axioms of the indestructibility of matter and the conservation of energy. But they urge also the still more recent doctrine of the Dissipation of Energy. Modern philosophers hold not only that there is a

certain definite amount of Matter in the world, which can neither be increased nor diminished, though it is continually undergoing transformations, and a certain definite amount of Force, which can take on many shapes—such as gravitation, electricity, heat, muscular contraction, molecular motion in the brain—but which, like Matter, can neither be generated nor destroyed; but they hold also that a large portion of this Force is continually becoming useless for all purposes of work, and that in course of time the whole of it will be reduced to this condition. For other forms of Force are perpetually being changed—by friction, collision, and other means—into Heat; and heat is only available for use as long as there is inequality of temperature. It is the passage of heat from one body to another—as, for instance, from fire to water, and from water to air—which generates available energy; but as soon as equilibrium is obtained, as soon as one body is as hot as that with which it is in contact, no more heat passes between them, and consequently no more energy can be got out of them. The energy is there, but it is locked up and unavailable. Heat, like water, seeks its own level and there rests. Just as you cannot turn a water-wheel without a difference of level, so you can do no work with heat unless you have a difference of temperature. The ultimate consequence of this is clearly put in our authors' words:—

“It thus appears that at each transformation of heat-energy into work a large portion is degraded, while only a small portion is transformed into work. So that while it is very easy to change all of our mechanical or useful energy into heat, it is only possible to transform a portion of this heat-energy back into work. After each change, too, the heat becomes more and more dissipated or degraded, and less and less available for any future transformation. In other words, the tendency of heat is toward equalisation; heat is *par excellence* the communist of our universe, and it will, no doubt, ultimately bring the system to an end.”

That is to say, the process of evolution, consisting always of the integration of matter and the dissipation of energy, will at last run all orbs together into one vast mass, out of which all energy will be gone, because all force will have been reduced to

heat, and all heat will be in equilibrium. And this, of course, involves the destruction of life :—

“It is absolutely certain that life, so far as it is physical, depends essentially upon transformations of energy: it is also absolutely certain that age after age the possibility of such transformations is becoming less and less; and, so far as we yet know, the final state of the present universe must be an aggregation (into one mass) of all the matter it contains—*i.e.*, the potential energy gone, and a practically useless state of kinetic energy—*i.e.*, uniform temperature throughout the mass.”

This statement, it will be seen, is absolutely universal. It is not confined to our earth or the solar system, but extends throughout all worlds. First of all, the earth and the other planets will be drawn by “ethereal friction” spirally nearer and nearer to the sun, and be at length engulfed in his mass :—

“In each such case there will be, as the result of the collision, the conversion of visible energy into heat, and a partial and temporary restoration of the power of the sun. At length, however, this process will have come to an end, and he will be extinguished, until, after long but not immeasurable ages, by means of the same ethereal friction his black mass is brought into contact with that of his nearest neighbour.”

In this way will ensue cycles of destruction and re-creation, illustrative on a prodigious scale of that rhythmic movement which, according to Mr. Herbert Spencer, is a universal law of nature : but all will at length come to a close :—

“But the present potential energy of the solar system is so enormous, approaching in fact possibly to what, in our helplessness, we call infinite, that it may supply for absolutely incalculable future ages— [this phrase is scarcely reconcilable with the ‘not immeasurable’ of the last quotation]—what is required for the physical existence of life. Again the fall together, from the distance of Sirius let us say,

of the sun and an equal star would at once supply the sun with at least thirty times as much energy for future radiation to possible planets as could possibly have been acquired by his own materials in falling together from practically infinite diffusion as a cloud of stones or dust, or a nebula; so that it is certain that, if the present physical laws remain long enough in operation, there will be (at immense intervals of time) mighty catastrophes due to the crashing together of defunct suns—the smashing together of the greater part of each into nebulous dust surrounding the remainder, which will form an intensely heated nucleus—then, possibly, the formation of a new and larger set of planets with a proportionately larger and hotter sun, a solar system on a far grander scale than the present. And so on, growing in grandeur, but diminishing in number, till the exhaustion of energy is complete, and after that eternal rest, so far at least as visible motion is concerned.”

But our readers will, perhaps, have begun to wonder whither all this is tending, or what connection it has with the professed object of the book, the Immortality of the Human Soul. It is simply this. If the soul be immortal it must be connected with something other than this visible frame of things. This present visible universe “began in time, and will in time come to an end. Immortality is, therefore, impossible in such a universe.”

Is there, then, any other universe or universes in which immortality may be possible? That is the question to which our authors next address themselves. And they begin by observing that, though the Law of Continuity holds good throughout the whole duration of this universe, it was apparently broken at the beginning, when its constituent particles first rose out of nothing, and will be broken again at the end, when they have settled into absolute and eternal rest. Creation and Inaction are alike breaks in the course of nature—a beginning of things and an end of movement take us equally out of the continuous chain of cause and effect, of antecedent and consequent. Can we, then, imagine a cause or antecedent—not extraneous, like a Creator, to the course of nature—out of which the original world-dust may have come? That is a question which evidently takes us straight back to the ultimate constitution of matter. What are the atoms—those impalpable and invisible entities, which, nevertheless, in Professor Clerk Maxwell’s judgment, bear all the appearance of “manufactured articles”—out of which all this visible frame of things is built? One thing, at any rate, we know about them—that they possess the quality of gravitation. But what is gravitation, and how does it act?

of gravitation. But what is gravitation, and how does it act? When two bodies gravitate towards one another, how is the action transmitted? Where is the cord that pulls, or the hands that press them together? How, except by transmission from one particle to another in contact with it, is it possible to conceive the progress of force? Action at a distance is unimaginable to any one who, in the words of Newton, "has in philosophical matters a competent faculty of thinking." But it is not only gravity that raises this question. Light, electricity, magnetism are also passed from body to body, apparently separated from each other by vast distances, through some medium which is absolutely invisible and impalpable, and, except by these effects, unrecognisable by any test which Science has been able to invent. What is this luminiferous, electric, magnetic, gravity-transmitting medium, which fills all space, but has neither weight, nor tension, nor resistance? Is it as some have thought an elastic solid or a perfect fluid, or a ceaseless rain of invisible corpuscles? Whatever it is, it is an "Unseen Universe"—our readers may now catch a glimpse of the meaning of the title of this book—as real and effective as anything our eyes can see or our hands can handle. Sir W. Thomson is inclined to look upon this medium, whatever it is, as the natural antecedent of the visible creation. In his view the atoms, which make up the mass of all visible bodies, are "vortex rings generated out of a perfect fluid filling all space."

By this theory, which our authors adopt with certain qualifications too subtle to be explained here, we are at last enabled to pass over the gulf which separates the Seen from the Unseen. If this visible universe were thus generated out of an invisible one already pre-existing, there was no need for any supernatural act of creation at its first appearance, there was no break even then in the perfect continuity of the chain of cause and effect. But if the visible universe were thus developed out of the invisible, it is obvious that it may with equal ease be resolved back again into it; and it is obvious also that the invisible universe precedes, accompanies, and outlasts the visible, so that though Immortality is impossible in the latter, it may be possible enough in the former. All that we see, all this material framework is developed out of the Unseen world, as smoke-rings are formed from air, or bubbles blown from water, "the only difference being in duration, these lasting only for a few seconds, and the others, it may be, for billions of years:" but as the air and water remain, when the smoke-rings have been dissipated, and the bubbles burst, so will the Unseen Universe abide, when the vortex-rings have ceased to rotate and atoms are, consequently, no more, and the Seen Universe has sunk back into the invisible fluid from which it rose.

But, after all, this is only one step backwards on a long and endless road, one link added to the chain of Continuity. Where are we to look for the link before it? What was the origin of this Unseen Universe? Was an act of creation necessary for its production? or was there another Unseen Universe preceding this one and giving birth to it, in the way of natural cause and effect, and, therefore, naturally also outlasting it? This last is the supposition which our authors make, and it is one which may evidently be multiplied any number of times. They arrive thus at the conception of an endless chain of Unseen Universes, each of which is the cause of the next, and each of which is outlasted by the next.

thus at the conception of an endless number of invisible universes, rising each above the other in different degrees, like a mathematician's series of infinitesimals of higher and higher orders, each universe peopled, probably, with its own intelligences, and each receding further and further into endless vistas of the past with the prospect of re-emergence, after the destruction of intermediate universes, into endless vistas of futurity. These all proceed by processes of natural development, while outside and above them all, for ever separate and supreme, stands the Unconditioned and Absolute Creator. His act of Creation is thus pushed back out of mortal sight and conception; but, nevertheless, the mind requires some bridge to pass over from the Unconditioned to the Conditioned, and this is found in the doctrine of the Trinity. Certain texts, we are told, are held by theologians "to indicate, in the first place, the existence of an unapproachable Creator—the Unconditioned One Who is spoken of as God the Father;" and, in the next place, "the existence of another Being of the same substance as the Father, but different in Person, and Who has agreed to develop the will of the Father, and thus in some mysterious sense to submit to conditions and to enter into the universe." This apparently is given as the explanation of the dead framework of all things. Life introduces a new idea. Abiogenesis, or spontaneous generation, is rejected by our authors—and this is the only point on which they hesitate to admit the most advanced speculations of the day—as against "the universal experience of the most eminent physiologists."

The first spark of life must therefore have been communicated from without, and its origin is to be looked for in the Christian doctrine of "the Lord and Giver of life:"—

"The Third Person of the Trinity is regarded in this system as working in the universe, and therefore in some sense as conditioned, and as distributing and developing this principle of life, which we are forced to regard as one of the things of the universe, in the same manner as the Second Person of the Trinity is regarded as developing that other phenomenon, the energy of the universe. The one has entered from everlasting into the universe in order to develop its objective element, energy; the other has also entered from everlasting into the universe in order to develop its subjective element, life."

Some of our readers, when they have read thus far, will be tempted to cry out that we have here only a fresh example of the old apophthegm that there is nothing new under the sun. Is

not all this, they will ask, only a revival of the old Gnostic problem to be solved very much after the old Gnostic fashion? How spirit and matter can be brought together; how the Infinite and the Absolute can be conceived as acting upon the Finite and the Relative is once more explained as it was sixteen hundred years ago by the introduction of an endless succession of *Æons* and a

Demiurge. That, however, is not quite a fair account of the matter, for it would be easy to point out some differences which separate the one scheme from the other. Still, the general likeness is not to be denied: but this important consideration must be added. The old Gnostic problem—if such it be—is here re-stated and re-solved under the light of modern science. In the early Christian centuries very little knowledge of the facts or laws of the external world could be brought to bear upon it: the philosophers who engaged in it could only spin webs out of their own self-consciousness. Now, the case is widely altered. Nature has been questioned at all points and has returned many answers, some of which are clear, distinct, and undeniable, while others are still dim, misty, and uncertain. All these must be taken into account in framing any theory of the universe. The peculiarity of the present work is that the authors are quite capable of doing this, and that they have, in point of fact, done it. They have no prejudices against any of the conclusions of modern science: they do, as a matter of fact, accept almost all those conclusions; and they do not feel themselves thereby precluded from accepting also not merely a vague sentiment of Christianity, but the dogmatic theology of the Christian Church. That, in the present state of public opinion, is in itself a most important fact. We may or may not be able to understand or accept the subtle theory by which they endeavour to establish an alliance between systems which are often supposed to be antagonistic; but it is a sufficient reason for inviting the respectful attention of our readers to this remarkable book, that men thoroughly versed in natural science should have made the effort, and at least to their own satisfaction should have succeeded. It is well to know that there are able physicists who can accept, at least in their general outlines, the theory of Darwin and the philosophy of Herbert Spencer, and find in them not only no grounds for repudiating Christianity, but even aids and steps by which their reason may mount up to a better apprehension of its mysteries.

THE INQUIRER June 26, 1875

THE UNSEEN UNIVERSE.—I.

The Unseen Universe; or, Physical Speculations on a Future State. London: Macmillan and Co.

The work lately published by the above title will be welcome to many a religious thinker. It shows strongly that convergence of scientific towards theological thought which Mr. Upton so well established in the *Theological Review* of July, 1874. It is said, by those who ought to know, to be the joint production of the eminent Physicists, Professors Stewart and Tait. And whilst science has been suspected of becoming more and more the slave of materialism, it is delightful to find it thus, with two of her most eminent representatives, becoming the very handmaid of the grandest spiritual faith. When we have such men as B. Stewart and Tait making for us the material and the seen only a kind of St. Augustine's ladder by which to climb up and out into the immaterial and unseen, we are consoled for the fact that there are other scientific men like Professor Clifford,* who would bar all egress into the unseen and spiritual to us, would turn the key upon us, and shut us up in the prison of the seen and material for evermore. The aim of the work under consideration is to show that there is an "Unseen Universe," revealed by science itself, and assumed in a large number of its theories, that this Unseen Universe probably existed before the Visible Universe, and will continue to exist when it has passed away. Out of this Unseen Universe, it is held, the one that is seen has been developed, into it again its energy is gradually passing, and into it at last probably its whole material will dissolve away, and

does cause us to see God under three different aspects—God as the absolute the unconditioned, God as the conditioned developing energy, and God as the conditioned developing life.

But when our authors attempt to harmonise their philosophical Trinity with the theological Trinity they descend from their high path and weaken the faith they had raised in the reader's mind. When they call God conditioning Himself as the developer of energy the Second Person in the Trinity, and God conditioning Himself as the developer of life the Third Person in the Trinity, and then see the Second Person incarnate in Christ, and the Third as the Holy Spirit of Theology, we feel that this union of philosophical with the orthodox and theological doctrine is arbitrary, forced, and unnatural. The authors, in truth, make just the same mistake that the Neo-Platonising Christians did with their logos. They had two aspects of God, one Greek as the Logos, the other Hebrew as the Holy Spirit, and these two, in a large measure overlapped each other. Now according to the Synoptical Gospels Jesus is presented quite as much as a manifestation of the Holy Spirit as of anything represented by the Logos. These philosophising Christians ought, therefore, consistently to have made the Logos and the Holy Spirit one, and Jesus the incarnation of both as one, or keeping them separate to have made him the incarnation of the two, and seen two persons—the Word and the Holy Spirit—incarnate in one Christ. And so with our authors. Having these philosophical hypostases of God in their mind, they wish to show that one of them is incarnate in Christ. But surely it is a mere arbitrary conceit to make Christ the incarnation of

Like the baseless fabric of a vision,
Leave not a wrack behind.

But the energy of the Visible Universe dissipated or passing into the invisible one is not lost there; neither will the matter,—which is probably also energy—that will be dissolved away into it, be lost. The whole is stored up there in perpetuated action, to be probably used hereafter in new creations, and in the meantime to make of the Unseen Universe a great organ of memory of all the history of the past. But not only every world, every human being also, is surrounded and pervaded by the Unseen Universe, and every motion of every molecule in the human brain accompanying thought goes forth, and propagates itself therein by corresponding motion. And so this "Unseen Universe," or a portion thereof, may be to each a spiritual body in which all the mental experience of his life is registered and living; and it may be, that after separation from this material body the mind or consciousness may still live on, keeping its memories and its individuality in this spiritual body, and though separated from this visible universe, may be so united to the invisible universe as to find in it a great memory of the eternal past. This it may go on reading, and thus enter into knowledge of things that eye hath not seen, nor ear heard, nor heart conceived.

But what is this "Unseen Universe," soaring into which Science and Faith at last meet and kiss each other? Some of the readers of the *Inquirer* may at once understand by being told that it is in substance identical with the "Heaven that Lies about us," of a work familiar to some Unitarians at least, published fifteen years ago. It is also in substance identical with the "Corona" of force reaching through infinity supposed to surround every world in space, every atom of matter, described in "Materialism, an Unscientific Habit of Thought," in the *Theological Review* of April, 1874. The "Unseen Universe" is partly that

the Agent developing Energy when, as he is presented to us in the Gospels, he is immeasurably more—the incarnation of Life—the highest kind of life, and, therefore, of the Agent developing life. It seems to us that Christ is the incarnation of both the Energy of God and the Life of God, just as man in general is this incarnation of both also. Man is the microcosm in which the Energy of the Universe is blended with the Life of the Universe and made its servant. We regret, then, this concession of our authors to a fading theology. Yet, notwithstanding, the "Unseen Universe" is a noble and precious book, in which, to use the words of Martineau, "the architects of science have raised over us a nobler temple, and the hierophants of nature introduced us to a nobler worship."
T. E. P.

THE "UNSEEN UNIVERSE."—II.

The Unseen Universe; or, Physical Speculations on a Future State. London: Macmillan and Co.

Professors Tait and Balfour Stewart have given us in their interesting book much sound scientific reasoning, and there is a form of the "Unseen Universe" which they present to us—though not quite as steadily and clearly as we could wish—that must be accepted as a legitimate and scientific inference. But, unfortunately, they have also given us some unscientific speculations, and some wavering views of the "Unseen Universe" which are not legitimate. We must be careful, therefore, to distinguish between the two. Scientific is their view, that surrounding and pervading the visible Universe, and probably filling all space, there is another Universe, invisible, impalpable, incomprehensible, which scientific men have agreed to call the Ether or Etherial Medium. "We know," our authors say (Art. 149), "that one body, such as the sun, can part with its radiant energy to an-

mysterious, inconceivable, invisible, intangible something which transmits the energy which we call Light and Heat from the sun to the earth and other planets, and which is called the Etherial Medium, the Etherial Force, the Ether, and partly that other something which binds the orbs in space together, binds all the particles of bodies together, imparts or transmits a large part of the energy of motion in winds and waves and falling bodies, and which is called Gravitation. Our authors are not very steady in their association of Gravitation with the Ether as one of the elements of the "Unseen Universe," but there are expressions here and there scattered through the book

which warrant us in making this association and in considering the "Unseen Universe" as consisting of the Etherial Medium co-existing in space with Gravitation, if indeed they are not both the same in different conditions.

Now the authors do not suppose these great powers, forces, agencies, or vehicles of energy to be dead and blind. They are—this seems their thought not their words—the spiritual body of God, who though absolute unconditioned in Himself, conditions Himself in them. The authors here give us again the idea of the Neo-Platonic Philosophy, that of the *λόγος προφορικός*, God manifested as distinguished from the *τὸ ὄν*, God the absolute, unapproachable. The authors thus find a Trinity in nature, (1) God the absolute,

(2) God the conditioned in the unseen Universe as the developer of energy, (3) God the conditioned in the unseen Universe as the developer of life. They thus very philosophically, as we think, keep life as something distinct from physical energy, which, though co-existing with it, is not the same thing. A somewhat kindred notion of Trinity was also suggested in the "Heaven that Lies about us." The absolute was there represented by God as he knows Himself, and the Logos as God putting Himself forth as love and energy. Only the agent-developing energy was the third instead of the second member of the series. We are not called upon to reject this conception by our authors of a philosophical Trinity. But it has no real relation to the orthodox Trinity of the theologians. We may confess that the conception of the Universe and of its author, which seems naturally to present itself through the views which the "Unseen Universe" has given us,

other body, such as the earth; and observation and experiment alike lead us to acknowledge a stage in which the energy has left the one body, and has not yet arrived at the other. But this means that there is something between these two bodies capable of moving and transmitting energy." We would for a moment avoid the word etherial medium, which the authors here employ, and say, "This something we agree to call the *Luminiferous Medium*." "Again," they say (*ibid*), "We know that different masses of visible matter attract one another apparently at a distance." Therefore, by reasoning parallel to that in the first paragraph, "this means that there is something between these masses capable of transmitting energy. This we agree to call the *Gravitiferous Medium*." Now, observe our authors have before laid it down (Art. 140) that we cannot do without some medium between the bodies to transmit gravitative energy unless we assume action at a distance. "But it is impossible (as Newton long ago pointed out in his celebrated letters to Beutley) for any one, 'who has in philosophical matters a competent faculty of thinking,' for a moment to admit the possibility of such action." There must, therefore, be a "gravitiferous as well as a luminiferous medium. We believe that it will ultimately be found that there is but one medium with two functions; in one function it transmits energy in the luminiferous undulations which travel at the rate of 180,000 miles a second; in

the other function it transmits energy—probably akin to pressure—in right lines, "with velocity almost infinitely great in comparison even with this enormous velocity" of light (Art. 143). At present, then, we will speak of the ether—using language of our own—as consisting of these twin media, the luminiferous and the gravitiferous, co-existing in space; and we shall, as we think, present the main thought of the "Unseen Universe" in clearer form than that in which the authors themselves present it.

Then, again, they seem to develop matter itself from the ether (Art. 152). What we call atoms are only vortex rings set up therein, having a beginning and an end, like the smoke rings developed from the mouth of the smoker, or the steam rings developed from the steam funnel of the locomotive. These last, it is true, exist but for a moment, whilst the atomic smoke rings may exist for billions of years. Still we prefer Pro-

essor Clifford's conception of the atom, which is, that whilst the atom differs from the ether only in being another state or mode of motion of the same stuff it is not a ring vortex, but an ordinary vortex as we understand it, like a globe of water made to revolve on its axis. Now it follows from these fundamental principles, which are quite scientific, that the theory of a spiritual or invisible body connected with the physical body of the mind—the brain—rests upon incontrovertible scientific data. In fact, from these data we *must* assign a spiritual or invisible body to every visible creature, every visible thing. If we take a single planet like the earth, and imagine it as it must be, surrounded by its ether, which fills all space, and records within itself in ethereal vibrations, records of all the movements of every atom in it since time began, thus presenting a great organ of memory of the earth's history,—and if we imagine the constitution of this ether that the gravitative portion must have,—how the

energy which fills it is ever acting in right lines *from immensity to the centre of the earth*,—and if we further imagine this great ether with this convergent action in it to become luminous, then it might appear to take a mighty infinite spherical nimbus surrounding the earth, with its convergent rays representing the gravitative energy. This, then, is a spiritual body to the earth. Now every atom must have a similar infinite nimbus of which, indeed, it is only the smallest part and centre. Every motion of the atom will be transmitted along the lines of gravitation, and if the motion be a vibration resembling the vibrations producing light it will be transmitted through the ether in waves of the luminiferous character.

Now as the human brain is composed of atoms, it will again have its own nimbus made up of countless millions of atom-nimbi. Here, then, is a real spiritual body, revealed by sober science, surrounding the brain, as the atom-nimbi of old were painted surrounding the heads of demigods and saints. The spiritual body has no outline like this material body. It fills all space radiating from its centre, the brain. How it is that when countless millions of these spiritual bodies cross each other in all directions, and occupy the same space, they do not interfere with one another, but each preserve its own individuality, seems difficult to understand. But we have the same wonder in the transmission of light. I might turn the great telescope aloft to-night and behold nebula whose light has been travelling through its spiritual body in the ether for more than a hundred thousand years. In some moment beyond that vast period, the vibrations of some of the atoms which compose that nebula, communicated their motion to the ether, and that momentary motion has been retained ever since and propagated onward in luminiferous undulations. Other waves from other nebulae, other stars have every moment crossed their path in every possible direction, and yet have not disturbed or confused them. Still they kept their own individuality, pursuing their swift but silent course. The thoughts that open upon us from this conception overpower us in their awfulness. Each of us, then, has a Being of infinite extent. And we may each think that our consciousness exists, not in this material body alone, but also in this immaterial body that accompanies; that it thinks and feels not only by means of the vibrations that are in the material brain, but by means of those also that

the material brain, but by means of those also that accompany them in the immaterial body of ether. And thus we can for a moment seem to catch a glimpse of the mighty overwhelming thought that we are living *now* in God's all-pervading life, and that our life is but a portion of His measured off and let out to us. Now the spiritual body must necessarily continue to exist when the body has ceased to exist. The spiritual body of that nebula still exists and transmits its vibrations of one hundred thousand years ago, though it might be that nebula had ceased to exist as a nebula ninety thousand years ago. Though it should then have been dissolved into thin, un luminous vapour, still the vibrations that it gave forth when it was a nebula will go on travelling through the ether, it may be throughout eternity. So the vibrations that represent all the motions of the molecules of the brain concerned in all the thoughts and feelings and actions of the mind throughout our life are still travelling on in endless undulations, in our spiritual body of ether, and so it may be that as our consciousness is now there as well as here, now in the spiritual body as much as in the material body, that when its connection with the material body ceases, it only retires entirely into the spiritual body, and retains its identity by finding in that body an organ of memory, containing in its vibrations the records of the past. In our next number we shall endeavour to show the bearing of Professor Clifford's arguments in the June *Fortnightly*, on the conclusions to which the authors of the "Unseen Universe" help us.

T. E. P.

The Liverpool Mercury 27/12/75.

EVENTS OF THE PAST YEAR.
BY THE REV. H. T. HOWAT.

SCIENTIFIC MEN NOT UNDEVOUT.

It would be a mistake, however, to suppose that the masses of our country, as the term is generally understood, are the only class of the population outside the pale of the church, and on whom the Christian teacher should bring his influence to bear. I believe, for example, that those who are seeking to show our men of science that there is a place for science and a place for religion at the same time, and that between the established facts of science and the great verities of religion there can be no contradiction, are doing one of the greatest services to the cause of Christianity in this land. Let us honour the town missionary in the dens and slums of the city, at the one extreme of society; but let us also honour the men who at the other extreme, and in such a book as "The Unseen Universe," published during the last six months, are endeavouring to bring the philosopher and the theologian together, and renew the examples of Newton and Faraday—princes in science, and yet humble, believing Christian men. There are few things more to be deprecated in this age of widening education than anything like a divorce between the literature and the religion, the intellect and the heart, of this nation. Nor do I believe that

our literary and scientific men either are, or wish to be, undercut. But in their attempts to pierce the secrets of nature they have too often been met in the wrong spirit. Their words have been misunderstood. Taunts of atheism have been cruelly flung out. Passions strange to calm philosophic research have been aroused, and never without mischief. If men of science have sometimes been rash, men of religion have not always been wise. We shall make nothing of our scientists by dogmatism and denunciation. We shall only drive them further and further away; and while Christianity must triumph in the end, its triumph is delayed, while religion for the present greatly suffers. Starting from a purely physical basis, the authors of the volume to which I have referred contend for the possibility of immortality and a personal God. They think they have found analogies in nature which throw light upon the doctrines of Christianity. To employ their own words, they seek to strip off "the hideous mask with which materialism has covered the face of nature, to find underneath (what every one with faith in anything at all must expect to find) something of surpassing beauty, but yet of inscrutable depth." In their judgment there is a path from the known to the unknown: it is the king's highway, and it must therefore be left open. As scientific men alone—and on principles into which I cannot go here, but chiefly what are termed the dissipation and conservation of energy, forming between them the principle of continuity—they maintain that "an unseen universe" is a reality. The authors of this remarkable volume have concealed their names, though there is little doubt, if any, that Professors Tait, Balfour Stewart, and Sir William Thomson, have had something to do with it. The book, whatever be our reservations, should be hailed by all the friends of Christianity as a welcome contribution to Christian apologetics, all the more that the keynote is this: "The presumed incompatibility of science and religion does not exist," and that what I may term the grand practical lesson is contained in these beautiful and memorable words, "A life for the unseen, through the unseen, is to be regarded as the only perfect life."

Manchester Examiner - April 28th

THE UNSEEN UNIVERSE.*

The position of Science with regard to Religion has of late years been so decidedly modified that the assertion of the old proverbial relation between them would now perhaps be considered the consummation of irony. The standard bearers of an important section of the army of Science certainly became more and more daring as the number of their achievements increased; the utterances of scientific scepticism, once faint and few, have not only become more frequent and stronger, but the more ardent champions of the school have advanced from mild doubt to defiant negation; defence has developed into attack; and the most sacred doctrines of the past are now openly despised as effete and baseless superstitions. The doctrine of a future life is nothing but a dream of the imagination; Christianity itself is a passing phase of thought, doomed to speedy oblivion, and even the vaguest form of Theism has been denounced as an unscientific and paltry compromise. And this extreme position of hostility, if not an inevitable consequence of the ignorance of presumptuous zealots, has assuredly been exaggerated by the conduct of men who have too often elected to stand or fall on ground

which gives all the advantage to their adversaries; while the indifferent onlooker witnessing their defeat has too often attributed the folly of the defenders to inherent weakness in their cause. There have, indeed, been occasional attempts at common understanding on the part of the less bigoted on both sides, but we need only refer to the discussion which took place some years ago on the efficacy of prayer as an illustration of the difficulty of finding a common starting point, and it will be admitted that the ablest efforts to reconcile opposing views have been at best only partially successful. The man of science who sympathised with the views of the theologian has indeed often been compelled to acknowledge the theologian's inability to comprehend the position of his opponent, and many enlightened men who have faith in the perfect accord between Science and Revelation have become avowedly hopeless of establishing it by argument.

But if in the past the presumed incompatibility between Science and Religion has seldom been discussed according to the properly exacting conditions of Science, it may be said without hesitation that the authors of "The Unseen Universe" have not exposed themselves to the charge of being unmindful of these conditions. We do not say they have succeeded in their efforts, but we have no doubt they will secure a

hearing from men not usually willing to listen to anyone who talks about an unseen world.

Some months ago it was rumoured that there might be shortly expected a work, by two eminent physicists, in which would be elaborated an argument for immortality and revealed religion based upon the results of scientific investigation; and if the book just published had not been attributed to able men, its internal evidence would have been sufficient to convince the accomplished scientific critic that he had to deal with no superficial students, but with men able to test, if not to initiate, the most abstruse investigation. Of the ability of the authors to speak in the name of science there can indeed be no doubt whatever; they may be wrong in their conclusions or partial in their estimates, but about their knowledge of the premises and their acquaintance with the secrets of physics there can be no question. The method of their argument will also immediately commend itself to the consideration of the candid; they never attempt to shirk a difficulty, to raise a false issue, or to use persuasion instead of argument, but in the course of the discussion the weak places of their own position are indicated as well as its strong points. The inquiry is throughout intellectual, appeals to the emotions have no place in it, and denunciations of opposition, it

is needless to add, are never indulged in. Its momentous and important subjects are proposed and discussed with no less dignity than fairness, and though the authors are perfectly candid in avowing their own opinions, and begin by declaring that they "assume as self-evident the existence of a Deity who is the Creator of all things," they are not unmindful of the conditions demanded by one of the most accomplished modern critics of theology. They admit that the number of disbelievers in the doctrine of the immortality of the soul has of late years greatly increased, and that at the present moment it includes in its ranks "not a few of the most intelligent, the most earnest, and the most virtuous of men." One of the objects of the authors' work is to examine the intellectual process that has brought about this result, confident that the scepticism they refute is not only not justified by what we know of the physical universe, but that, on the other hand, there are many lines of thought which point very strongly towards an

opposite conclusion. We shall not attempt to give more than a general idea of the arguments of this remarkable book, and, inviting as are several of its themes, we must resist the temptation to discuss them; the authors themselves have apparently more than once been compelled to turn away with regret from the consideration of some of the questions forcibly brought before them. In one or two instances, probably, the reader will wish that the inquiry had been pursued further, and he will more than once have to

infer opinions where he might have expected a statement of them ; but candour and courage are equally conspicuous in the book, and it is long since a work of the kind appealed to the readers for whom it was intended with so many and such powerful claims. It cannot, however, be said that the general argument of the work is so elaborate and complete as the discussion of its several parts, and while the authors' attempt to harmonise the teachings of science with the doctrines of the Bible will commend itself to many readers, it is not unlikely that its omission would have more thoroughly concentrated attention on the main purpose of the work.

At the outset we are told that the authors address themselves especially to those who see strong grounds for believing in the immortality of man and the existence of an invisible world, but who at the same time are forced to acknowledge the strength of the objections urged by certain men of science. They have no hope of influencing those who will maintain that any scientific deduction which contradicts their religious opinions must be fallacious; but though they are not very sanguine of winning over the men of the extreme materialistic school, they hope that to these men "their scheme will be found to suggest a more complete and continuous explanation of the visible order of things than one which proceeds on the assumption that there is nothing else." The authors look upon the visible universe as an effect,

having an immutable bond of connection with an invisible universe, the conditions of which are different from those of our universe; they support their views by the doctrine of man's inability to create or destroy a single particle of matter, but they accept the definition that matter is only a modification or affection of a more subtle and ethereal substance—"a perfect fluid"—and that matter as it now exists, with all the concomitant energy proper to it, whether self-contained or extraneous, may completely disappear without any violation of the laws of nature. The fixed character of these laws is admirably defined in the discussion of the "Principle of Continuity," by which it is proved that the universe is under an orderly government. The principle of continuity accounts for the occurrence of strange and unforeseen events, but not of such as must finally put to confusion the intelligent beings who regard them. Thus it is maintained that no explanation of miracles or other extraordinary phenomena is satisfactory which suggests a suspension of law or any eccentric violation of continuity. The authors entirely reject every belief founded on the idea that in this universe the human race may enjoy an eternity of bliss; they assert positively that, on the contrary, the visible universe must *certainly in transformable energy, and probably in matter, come to an end,* but,

and here the point of their argument is seen, "the principle of continuity, demanding a continuance of the universe, we are forced to believe that there is something beyond that which is visible."

In the long chapters in which the laws of energy and the ultimate constitution of matter are discussed will be found a comprehensive outline of the most important recent investigations and discoveries in this region of inquiry. The conclusion adopted by the writers of the results in their survey is that the visible universe has been developed from the invisible; and in examining the laws which scientific experience warrants them in asserting that it invariably follows they endeavour to reply to the question, "Has the visible universe always worked in its present manner, or has there been any apparent break?" Here, of course, a discussion of Mr. Darwin's theories ensues. The establishment of the Darwinian hypothesis would not, however, affect the position held by the authors; for while they admit the possibility of accounting for the great variety of living forms on the supposition of a single primordial germ, the difficulty of accounting for the existence of this germ would still remain, since scientific experience is against the notion of the appearance of life without the intervention of a living antecedent.

The chapter on the "Possibility of Superior Intelligences in the Visible Universe" might at first appear to involve an utterly needless

inquiry; but to some believers in the existence of intelligent angelic influences it may be useful to follow the reasoning by which it is shown that the existence of such intelligences, which cannot be perceived by our bodily senses, is not dependent on the fate of the visible universe.

The authors do not probably count upon a general acceptance of their theory of accounting for the apparent waste of energy in the universe, nor is it very easy to understand what is meant by "our universe keeping up a memory of the past at the expense of the present." The difficulty to be explained is that all but a very small portion of the sun's heat goes day by day into what we call empty space. What becomes of the unused force? Nature is not wasteful, and since this excess of expenditure involves the more speedy destruction of the universe itself, our authors endeavour to discover its object. They suggest that the ether, or subtle imponderable fluid of which light is an affection, is more than a medium between one portion of the visible universe and another, but that "when energy is carried from matter into ether it is carried from the visible to the invisible; and that when it is carried from ether to matter it is carried from the invisible to the visible." The remainder of the argument shall be given in the authors' own words:—

If we now turn to thought, we find that inasmuch as it affects the substance of the present visible universe, it produces a material organ of memory. But the motions which accompany thought will also affect the invisible order of things, and thus it follows that "*Thought conceived to affect the matter of another universe simultaneously with this may explain a future state.*" This idea, however, requires further development and explanation. Let us, therefore, begin by supposing that we possess a frame, or the rudiments of a

frame, connecting us with the invisible universe, which we may call the spiritual body. Now each thought that we think is accompanied by certain molecular motions and displacements in the brain, and part of these let us allow are in some way stored up in that organ, so as to produce what may be termed our material or physical memory. Other parts of these motions are, however, communicated to the spiritual or invisible body, and are there stored up, forming a memory which may be made use of when that body is free to exercise its functions. Again, one of the arguments which proves the existence of the invisible universe demands that it shall be full of energy when the present universe is defunct. We can, therefore, very well imagine that after death, when the spiritual body is free to exercise its functions, it may be replete with energy, and have eminently the power of action in the present, retaining also, as we have shown, a hold upon the past, inasmuch as the memory of the past has been stored up in it, and thus preserving the two essential requisites of a continuous intelligent existence.

The authors are frank enough to suggest some of the objections likely to be made to their theory, and proceed to answer them *seriatim*. We can scarcely suppose they believe they have exhausted the list; if so, it is not unlikely they will be speedily undeceived. But whatever may be thought of the theory itself, it will be generally conceded that in the work before us the question involved has been considerably simplified, and that the bearing of science on the discussion has been carefully defined will be readily admitted by many who will not be prepared to accept the conclusions of the authors. The brief discussion of the contending theories of the extreme Materialists and extreme Idealists is worthy of attentive consideration, and the scientific view of the future of the physical universe has seldom

been so eloquently and so forcibly stated.

The work will probably perplex some readers, and leave many more unconvinced, but all will do justice to the ingenuity with which the writers work out their hypothesis. The followers of Swedenborg, who is mentioned with great respect, and whose alleged intercourse with the inhabitants of other planets, we may remark, is not dismissed as intrinsically unbelievable, will fancy they recognise one of their peculiar doctrines in the "spiritual body" as described in the above extract. The speculations indulged in lie, of course, beyond the scientific domain, and are incapable of anything approaching to scientific proof. They are, indeed, mere conjectures of an exalted type, and all that the writers succeed in showing is that they are not incompatible, but rather in harmony, with the conclusions of science. But to show this is to render a very useful service to the interests of religious faith, more especially as the same reasoning may be applied analogically on a still wider scale. All that theology needs is the concession that its larger teachings are not in fatal and irresolvable contradiction to ascertained facts. This position is almost universally assumed already by those who combine scientific culture with definite religious beliefs, and the interest of the present work lies in the abundant evidence it affords that such a position finds ample and cogent warrant in the widest and most advanced scientific generalisations of our time.

17 *The Monthly Packet*—no date

THE UNSEEN UNIVERSE.

'We look not at the things which are seen, but at the things which are not seen; for the things which are seen are temporal, but the things which are not seen are eternal.'

These words, in the original Greek, stand on the title-page of a most remarkable book, as showing its plan and argument throughout. It is with the hope of inducing a more general study of this book, that we attempt a slight sketch of its outline, with the briefest possible *résumé* of its contents. We warn young readers that though by no means dry, it is difficult reading, while, on the other hand, we assure them that it will repay any amount of time and trouble spent over it.

It is difficult to overstate, as matters stand at present, the importance

of a correct view of the bearings of Scripture and Science one upon another. No intelligent person can remain insensible to the direction in which the currents of literature and thought are moving in the present day. There awakes in us from time to time a certain uneasy sensation, as if old landmarks were disappearing, and we were gradually losing ourselves in a maze of scientific speculations which we cannot see to be in accordance with what we have understood to be Scriptural teaching. We feel like children drifting along on a rapid stream in an unmoored and rudderless boat, losing sight of all familiar objects, and unknowing whither the stream is bearing them. Even those who do not care to study any science, who say that they have no such tastes, do not seem to escape from the difficulty. These questions enter so largely into the general tone of thought and conversation, that every social gathering, every newspaper or periodical, to say nothing of the modern poetry and philosophy which fill our drawing-rooms and our bookshelves, seems to contain more or less this subtle aroma of scepticism. And if this be so, what of those who, having such tastes and desiring to enter with ardour into such studies, feel themselves checked and discouraged, cut off by conscientious scruples from pursuits that they instinctively feel ought to lead them up to God rather than away from Him? We have known of some startled more than they cared to avow, by the detection of religious indifference or open contempt for Revelation in the works of scientific writers, thinking that as they could not find the connecting link between Revelation and Science, it was better to ignore the latter altogether. But is such *ignoring* possible in the present day? If possible—would it be right? We think not, because if God has willed that the present should be an age of scientific enlightenment, we cannot do Him service by wilful ignorance. Ignorance has never yet been a foundation for Faith, and further, if those of truly sound faith will take the trouble to train themselves in elementary science they may be of incalculable benefit to the cause of Truth, wherever their duty brings them in contact with those younger, feebler, less well-educated than themselves.

The Unseen Universe ; or, Physical Speculations on a Future State, is one of the most wonderful adaptations to the need of the present day that this generation has seen. It cannot be challenged by sceptics on the score of religious *animus*, party bias, or unproved dogmatic assertion, it bears the stamp of no theological school, it is not the work of theologians or divines. Its authors, for there are two, are men of science, so distinguished that their opinions carry weight with their own class on matters within the sphere of scientific proof, on the one hand, while on the other, their reverent acknowledgment of One who is above, beyond, and outside of His own created universe, should satisfy theologians of every school of thought. Science, as sceptics will have it, attacks the revelation of God in Christ; to this they unflinchingly adhere throughout.

Another advantage of the book is this—they write to be understood by the many. Scientific language, of course, often presents a difficulty. A defence of Revelation, if made in very scientific terms, is hardly intelligible to the mass of readers for whom it is meant. Our authors use scientific terms just when they are necessary, and then as simply as they can, and with all possible explanation. They are not concerned with this or that branch of science any more than with this or that religious party, they set Science as a whole beside Revelation as a whole, and their argument runs thus:—If Revelation shows us a certain set of facts, and Science another set of facts, let us place these together and we shall see that both lead us exactly to the same point. We quote from their preface—

‘Our object in the present work, is to endeavour to show that the presumed incompatibility of Science and Religion does not exist. This, indeed, ought to be self-evident to all who believe that the Creator of the Universe is Himself the Author of Revelation. But it is strangely impressive to note how very little often suffices to alarm even the firmest of human faith.’

The book opens with an Introductory Chapter, dealing with men as composed of two classes—students of the ‘How’ of the Universe, and students of the ‘Why.’ This is a principle of division as old as Aristotle, but there follows a charming original illustration of a great ship carrying two sets of passengers, one on deck, looking to the end and aim of the voyage, the other below, studying the engines.

‘Occasionally there is much wrangling at the top of the ladder where the two sets meet, some of those who have examined the engines and the ship asserting that the passengers will all be inevitably wrecked at the next port, it being morally impossible that the good ship can carry them further. To whom those on deck reply that they have perfect confidence in the steersman, who has informed some of those nearest him that the passengers will not be wrecked, but will be carried on in safety past the port. And so the altercation goes on; some who have been on deck being unwilling or unable to examine the engines, and some who have examined the engines preferring to remain below.’ (P. 3.)

The authors then begin by tracing the belief in the immortality of the soul from the earliest ages. Though greatly obscured, and held in connection with gross errors, this doctrine has never been wholly denied by large masses of mankind. It is among the scientific class—the disciples of ‘How’—that sceptics of the soul’s immortality are mostly found, but no nation has long continued great in history after declining from this belief. A rapid but masterly sketch is given of the forms in which the doctrine was held by the ancients, taking them in the following order:—Egyptians, Hebrews, Greeks and Romans, Orientals, *i.e.* Brahmins, Magians, Buddhists. Care is taken to note, while speaking of the Hebrews, the influence of Egyptian teaching on Moses—

‘Without discussing the question of Inspiration, we may readily imagine that, himself a believer in the unity of God, this sagacious leader must have perceived the deficiency of a religious system in which the truth was confined to a few, while the many were allowed to remain in the most degrading idolatry. He was

thus in a fit state to recognise the paramount importance of the whole mind and mass of the nation being pervaded with a belief in one invisible, ever-present, ever-living God. We do not, however, mean to assert that Moses got his religious system from Egypt, but we think it possible that his mind may have been prepared by the failure of the Egyptian system to receive a better one.'

Next there is shown, in a few remarkable paragraphs, the bearing of Christian teaching on these ancient beliefs, and then follows the consideration of the position of Mohammedanism with regard to Christianity (p. 31). The point kept steadily in view is this—belief in immortality being natural to man, what are the different outward expressions of it? So we are led on to what are commonly called the dark ages, marked by a singular lethargy on many subjects, most of all on science. There probably never will be, as there certainly never was before, a more remarkable stirring of the minds of men than that to which we refer when speaking either of the Renaissance or of the Reformation. Let us not be misunderstood as confusing the two when we say that the same spirit led to them both, and God has overruled that men should never again sink back into the lethargy from which they were then awakened, least of all perhaps in the department of science. Men who could not be discoverers while liable to be burnt alive for heresy, came to the front now. The same spirit that set men free to read the Bible for themselves, set them free to look into the created works of God, so while science owes its very birth to religious freedom it may lead, rightly directed, to a better understanding of the invisible things of God where these come in contact with the visible;—ignorance, as we have said, never helps faith.

Then follows a lucid statement of the case between men of science and theologians, with a wise distinction between extreme and moderate leaders on both sides. In speaking of the false systems which have appeared since Christianity, they instance Emmanuel Swedenborg, and it is noteworthy that they can confute him as strongly on scientific as on religious grounds, even while owing to much that is thoughtful in his theories.

In speaking (p. 35) of the difference of religious and scientific teaching, the following point of *similarity* between them is well brought out:—

'Both, we conceive, maintain in some sense the supremacy of law, or the invariability of the procedure adopted by the Deity in the government of the universe; both maintain likewise that the outer works of the visible universe are insufficient to manifest certain attributes of the Deity. Here, however, the likeness ends. . . .'

In Chapter II. the authors take up their position and show their plan, dividing the classes of their readers into three—those who are convinced of the truth of Revelation, those who would fain be convinced, but are perplexed by the scientific difficulties in their way, those who do not wish to believe—extreme materialists, sceptics.

First they lay down a few axioms (an axiom of course meaning some-

thing accepted by both sides as true, so that we need not spend time in proving it). They assume the existence of a Creator of all things, and the chief axiom is the Principle of Continuity. This must be carefully studied, being a universally sound principle, yet one that has been often foolishly set aside on the so-called religious theory, that God can do whatever He pleases without regard to laws, so that in times of imperfect science men called everything 'a miracle.' True, God is not fettered by His own laws, but we are not concerned with what He *can do*, but with what He *does* and has done. Science shows to the careful inquirer much; Revelation of course shows more; but neither of them claim to tell us more than this. The Principle of Continuity might be thus stated by a scientific man:—The government of the universe has proceeded on a certain plan, ruled by certain fixed laws, we may therefore infer that it will continue to be so; and it might be thus stated by a religious man:—'God has endowed us with certain capacities which enable us to dwell safely in the world and serve Him according to His laws. He will not distress or alarm His children by capriciously suspending or setting aside the laws which guide His universe. Our authors state it thus:—

'The power of the Divine Being is surely unlimited, but nevertheless we have perfect trust that God will work in such a way as not to put us to permanent intellectual confusion.' (P. 62.)

We know that uselessly to multiply miracles is to degrade them to the level of mere conjuring tricks; nothing can be less consonant with their Scriptural aspect.

It is also shown that a number of things exist which are not matter, in short they cannot be perceived by our senses, they are not subject to physical laws, and yet nobody would dispute their reality. By a series of able deductions we are shown—

1. That there are certain things which are visible.
2. That there are certain others which are invisible.
3. That on the principle of Continuity a certain set of laws are and have been always at work producing certain results.

It is here argued (by anticipation, it will be proved afterwards), that the visible universe, by the very operation of its laws, is coming to an end; but that the invisible universe, on the principle of Continuity, will go on in its unbroken course—there will be no break in its laws. Science, then, is here at one with revelation, which tells us that 'the things which are seen are temporal, but the things which are not seen are eternal.'

Chapter III. is difficult, but thoroughly rewards careful reading. The terms are scientific, but they are explained when it is possible, and the main drift of the argument is not over our heads. We are reminded (p. 70) that a good deal of the universe is intangible though real, and '*Experience of the most varied kind consistently shows us, that*

we cannot produce or destroy the smallest quantity of matter. [The italics are not ours.]

Two important laws are thus arrived at—the Conservation of Matter, and the Conservation of Momentum. We go on to an able sketch of the Laws of Motion, and a description of the two kinds of power called the kinetic and potential force. It is shown how these two kinds work alternately, playing, as it were into each other's hands, when one ceases the other begins, like the innings of a game of cricket. There is also a slight inquiry into the laws of thermodynamics, or of Heat-power; these have an important part to perform in our universe. We know that hot and cold are merely relative terms, and that heat-power depends upon the fact of some parts of the universe being more highly heated than others; were temperature equalized throughout, heat-power would be at an end. It is quite possible by observing the present working of this force to arrive at some idea of the manner in which the present solar system was evolved, and the conclusion that by these same laws the visible universe is gradually working itself out. Therefore:—

'We have thus reached the beginning as well as the end of the present visible universe, and have come to the conclusion that it began in time and will in time come to an end. Immortality is therefore impossible in such a universe.'

Chapter IV. deals with Matter and Ether, and again it requires care in order to follow the general argument. It takes us back to old Greek philosophies and theories of the production at the first of the 'Atom,' and then of the production of the visible universe by the drifting and whirling together of these Atoms. Much is said of the atheist-poet and philosopher, Lucretius. His declarations on the subject of religion and the gods sound blasphemous, but when we recollect his date, 54 B.C., we see that these assertions, terrible in their calmness, of the nothingness of a God, a soul, an eternity, are but the outpourings of human despair, and God willed it should be so. He permitted heathen systems to take their day, He willed that heathendom should do its utmost, and that then the utter failure of all false worship, however beautiful in its first ideas, to purify, ennoble, and exalt mankind, the failure of all philosophies to strengthen or support or guide, should naturally strike the higher and more intelligent thinkers of the day, till recoiling from the horrors of idol-worship, they tried to seek a God in the beautiful visible creation itself. This was Pantheism. This, too, utterly failed them, for personal creatures cannot have an impersonal God, and so men lapsed into Atheism. The darkest chilliest hour before the dawn! God was with man, but man knew it not. Lucretius is writing against Heathenism for Atheism, and there is much that is striking in his deductions. It is worth while to see how utterly false his science is, the argument of our authors being that *all* Atheism is scientifically false. As we go on through this chapter we are next struck by finding, in spite of all our boasted modern enlightenment, how very little is really discovered

beyond what the ancients knew or guessed at—a nebulous formless condition of Matter and Ether, out of which no principle of Life could have come without an External Great First Cause. Science, be it remembered, leads us to inquire into the 'How' of Creation, and it moves but slowly to perfection. In some respects we have gone but little further than the Greeks with their atomic theory, but our discoveries of the laws of Matter, Ether, and Motion indicate a condition of things very like what Genesis dimly shadows forth. This portion of the book must be carefully studied; and then we have (p. 118) this striking suggestion:—

'In our last chapter we came to the conclusion that the available energy of the visible universe will ultimately be appropriated by the invisible, and we may perhaps imagine at least, as a possibility, that the separate existence of the visible universe will share the same fate, so that we shall have no huge, inert, useless mass existing in after ages to remind the passer-by of a form of energy and a species of matter that is long since out of date and functionally effete. Why should not the Universe bury its dead out of sight?'

When we place these remarkable words side by side with 2 Pet. iii. 10-14, does it not strike us that the true students of the 'How' approach closely the students of the 'Why' of God's Creation!

Chapter V. deals with the question of Development, dividing it into *a.* Chemical, *β.* Globe, *γ.* Life, Development; or, we may say, development of the materials, of the house from the materials, and of the inhabitant of the house.

In few and telling words we are given the theory of 'Chemical Development,' *i.e.* compound substances from simple—a process which goes on under our eyes every day; then taken onwards to the formation of worlds by these same processes, and the manner in which these worlds act one upon another. The summing up of the argument (p. 127) is this:—

'The very fact, therefore, that the large masses of the visible universe are of finite size, is sufficient to assure us that the process cannot have been going on for ever, or in other words, that the visible universe must have had its origin in time, and we may conclude with equal certainty that the process will ultimately come to an end.'

The end to which our philosophers point is the absorption of the earth into the sun, which, as we have said, would be precisely in accordance with the words of Revelation.

But the next point is Life-Development, and this brings us on hotly-contested ground. The question whether it pleased the Creator first to impart a principle of life, and then leave it to work itself into every possible variety of living organism, from a jelly-fish to a man, commonly called the Evolution theory, or whether He produced the varieties of organic life from parent stocks distinct from the very first, is probably the most engrossing subject of dispute between the two classes of thinkers—scientific and theological. The latter say the Evolution theory contradicts Genesis; the former: then let us give up

Genesis. In fairness to our writers we must give their own words (p. 131):—

'Our point of view is somewhat different from that of either of these two parties. We think it not so much the right or privilege as the bounden duty of the man of science to put back the direct interference of the Great First Cause—the unconditioned—as far as he possibly can in time. This is the intellectual or rather theoretical work which he is called upon to do, the post that has been assigned to him in the economy of the universe.'

These words are important to both parties. Religious minds are apt to be unreasonably distressed at the necessity (scientifically speaking) for thus 'putting back' the interposition of God to an almost incalculable period. But once concede, what most people now gladly concede, that the word 'day' in Genesis merely signifies 'a period,' and there is not another word in Genesis i. that in any way limits the extent of the ages before man appeared. If it be not, as we reasonably infer,* six days, it may be any number of millions of years.

After giving some interesting facts on varieties of species we are brought (p. 135) in face of the Darwinian theory of development, with a few modifications of it as held by Mr. Wallace and Professor Huxley.

To a thoughtful mind there can be no doubt that we have an enormous and interesting field yet unexplored, of discovery of the development of lower races of animals; and here it is candidly admitted that although we are not compelled to follow Mr. Darwin and Mr. Herbert Spencer into all their speculations, yet there is a strong probability that in their hypothesis of Natural Selection they are so far on the right road. The one point upon which we may reasonably be anxious is this:—Are these discoveries, real or fancied, at war with the idea of a Creator in time? No, certainly not. The variety of organisms on the globe having been produced from one original life-germ would not be the smallest hindrance to our faith, 'Life can only come from Life' is a well-attested scientific fact. Our authors put the question thus:—

'It is against all true scientific experience that life can appear without the intervention of a living antecedent; how then are we to explain the production of this primordial germ? If . . . a pure act of creation in time be an inadmissible hypothesis, and if the hypothesis of Abiogenesis be equally inadmissible, our readers may well ask, how are we to surmount the difficulty? For our reply to this question we must . . . refer them to our concluding chapter.'

Chapter VI., though difficult, is one of the most important in the whole argument, as also one of the most beautiful and poetic. It opens with a summary recapitulating the points by which we have seen that Immortality is one of the deep-seated needs of our race; that this

* Hebrew scholars have assured us that verse 5 would be more strictly correct—'and the evening was, and the morning was, and the first day,' in short, expressing that through the period termed 'day' interchange of light and darkness continued, as it naturally would, from the time that rotation of the earth on an axis began.

Universe was created in Time, and by its own laws is working itself out, so that unless there were an Unseen Universe beyond, immortality would be a useless chimæra. It then goes on to infer the reasonable probability that there should be Intelligences analogous to man, yet superior to himself. It adverts to the world-wide superstitions on the subject of invisible beings peopling each element, a belief which has enriched with such treasures of poetic fancy and feeling the literature of all nations. The most beautiful quotations from living poets are given, and thought suggests hundreds more. Do we not owe the fairy tales of childhood, the Ariels and Undines of riper years to such ideas, wrought into shape by the poets? who talk of 'airy tongues that syllable men's names'; of 'elves that chase with printless foot the ebbing tide,' until the beauty of the fables leads us on to see an evidence of the truth God has graven in our human nature too deep to be erased by scepticism—the need of a world of spirit and of our own communion with it.*

'We entertain no doubt that man, and beings at least analogous to man, represent the highest order of living things connected with the present visible universe.' (P. 150).

From this point the chapter takes up the view which pervades Scripture in both Testaments, of the place of man in the universe as shown forth in Ps. viii. 5, 6 (marginal reading), and shows that science, placing man as the highest living organism in the *visible*, testifies that any superior intelligences must therefore belong to the *invisible* world, and that it also witnesses to man being the creature of whom Scripture tells us—that he shall put on immortality and share glorified life with Him who has vanquished death.

From this we pass to the beautiful concluding Chapter VII., headed The Unseen Universe. The foregoing arguments are all drawn in and wound up to a centre. Science and Religion, the teachers of 'How' and 'Why,' both point to a coming catastrophe.

The question is fearlessly asked—What of the 'spiritual body' of which Revelation speaks? Is it possible that even now it may be building up, framing for Eternity? A long quotation is given from Dr. Thomas Young's *Lectures on Natural Philosophy*, and then objections are dealt with—(1) Religious, (2) Theological, (3) Scientific, in due order. Next is demonstrated the need of a Ruling Intelligence to bring this great Seen Universe into being, and to continue the existence of immortal beings, when the sun by its own fixed laws shall pass away. The present position of life in the universe is set forth (p. 179). The

* How far this belief in the peopling of the elements with airy beings still subsists in remote districts of our own islands might surprise some of our younger readers. Not many years ago the writer of these pages was intreated, while sketching on the shores of a wild little Highland loch, to abandon her convenient seat on a fragment of grey rock, because it was the favourite haunt of the 'Vuagh,' or water-fairy, who would resent the intrusion!

school of Darwin and Huxley have done good service in clearing away unscientific and foolish theories which people mistook for Faith in the Unseen. It is right and laudable to show how God has worked, not in caprice but on a series of marvellously complex and yet simple laws. It is right to place Life and Will *outside* the physical universe; let Atheists do this, they can do no more. Whenever they proceed to deny that Life and Will are awful realities of which science alone cannot grasp the mysteries, they perplex themselves in endless labyrinths, and end by hopelessly confusing their Science.

Therefore—

'Life exists just as surely as the Deity exists. For we have subjected both these mysteries to the same process, and have found it as difficult to rid ourselves of the one as of the other.'

Put it as far back as we will, there cannot be even animal life, how much less a living soul, unless God give it. Thus the Creator must ever remain outside of and antecedent to Creation, in spite of all classes of reasoners, who professing to be wise become fools, and say in their heart there is no God. The most rationalistic of these are compelled to own that they cannot account for the origin of Matter or of Life; now the creation of these two, *separately*, is precisely what Genesis tells us, no matter how metaphorical the language may be. If any man rejects the inspired account, he is bound to confess that by the great laws of Conservation of Energy, and Biogenesis, his science is utterly at fault. An intelligent agent in the universe, is the only solution of the difficulty.

Hitherto the subject of miracles has been touched but slightly. We cannot better do justice to the argument now given than by quoting the following (p. 189):—

'We have now reached a stage from which we can very easily dispose of any scientific difficulty regarding miracles. For if the invisible was able to produce the present visible universe with all its energy, it could of course *a fortiori* very easily produce such transmutations of energy from the one universe into the other, as would account for the events which took place in Judæa. These events are, therefore, no longer to be regarded as absolute breaks of continuity, a thing which we have agreed to consider impossible, but only as the result of a peculiar action of the invisible upon the visible universe.'

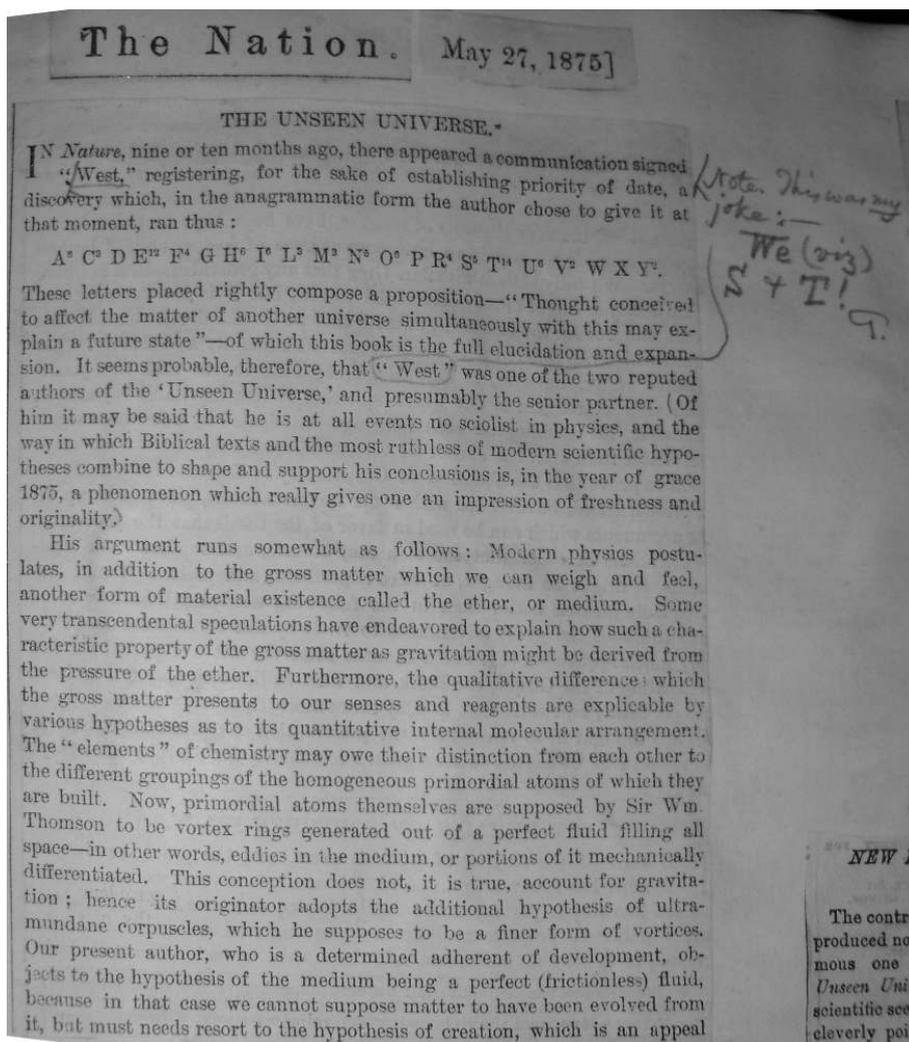
We hope these beautiful words will be carefully weighed by any of our readers who may ever have felt even a moment's passing perplexity or pain, on reading the strangely repellent and startling attacks not only on this or that recorded miracle, but on the whole system and teachings of miraculous interpositions. This unworthy mode of handling such topics distresses us the more, when done by men who would indignantly repel the charge of seeking to undermine Scripture or deny Revelation. All they wish, so they say, is to eliminate from the Bible, as merely a human admixture due to imperfect science, all that implies a breach or cessation of Nature's laws. *We* feel that were men permitted thus to deal with the Word of God, they would soon

deprive us of the Bible altogether; and, judging by the acute arguments now before us, the science of such a proceeding would be as false as its theology. There is a happily chosen simile (p. 189) of the disturbance consequent on digging up an ant-hill. We may imagine the terror and confusion of the poor ants, and how to them it would appear like some terrible 'breach of continuity in the laws of Nature,' merely because in their large 'ant-experience' they had never seen the like before! But how would it appear to the human operator?

'... in like manner the scientific difficulty with regard to miracles will, we think, entirely disappear if our view of the invisible universe be accepted, or indeed, if any view be accepted that implies the presence in it of living beings much more powerful than ourselves.'

We see, then, the real grounds on which we may gladly hail any fresh discovery, or engage in any study whatever, confident that in so doing we help to advance the time when the earth shall be full of the knowledge of the glory of the Lord. We may rest assured that when any truth is capable of being brought to light by the working of human reason, it is distinctly for the glory of God that all should work at it as hard as they will.

The last few pages are exquisitely beautiful on the final reconciliation of scientific with religious thinkers. That there can ever be disunion between any two sets of earnest seekers after truth is, of course, a defect in the manner of their search, not in its object and aim. It was plainly no part of God's purpose to reveal scientific truth; the laws and wonders of His Visible Creation being within the sphere of human reason He left His children free scope for the exercise of their powers. On any subject we can thus study for ourselves, Revelation throws no new light, because it need not. It gives all knowledge necessary to fit us for the life that lies beyond visible things, going far beyond science, because it enters the Unseen Universe, but never ignoring, still less contradicting, well-attested scientific facts. It welcomes all the aid science can give in the right interpretation of Scripture, for, of course, like all highly metaphorical writings, the Blessed Scriptures are singularly open to misinterpretation, whether by friend or foe. And let us remember—we are apt to forget it—that these are regions of thought into which revelation gives as little entrance as science. In vain men speculate on the origin of evil, nay, even on the origin of life. Scripture makes a few statements about the latter but never explains them; upon the former it never enters at all. And, as the duration of the 'day' of Genesis, so is the final 'day' of the Lord's appearing, an insoluble enigma. Scripture and Science both point to a coming catastrophe, the one in language a child can understand, the other in the wordless eloquence of Nature's changeless laws. As we gather from Science that this doom is inevitable, so we know from Scripture that it will be sudden and awful, taking men by surprise.



to the unconditioned always to be avoided ; and moreover, because certain facts connected with the light of the stars suggest the conclusion that the ether is not perfectly transparent, but *absorbs energy*. But with whatever differences of detail, the upshot of all these speculations is that matter and the medium, or the visible and the invisible, are considered materially and dynamically continuous. One arose in time by a coagulation or precipitation occurring in the other, and must needs end in time, if the other be not a perfect (frictionless) fluid, by the undoing of the momentum of rotation it contains. The great law of dissipation of energy, too, which requires us to imagine a constant leakage into the ether of heat vibrations from the visible world—vibrations which will never be restored—leads to the same conclusion. The energy which is leaving our visible world in every direction at the rate of 188,000 miles a second *is not lost*. “It will all be ultimately appropriated by the invisible world, and we may now imagine as a possibility that the separate existence of the visible universe will share the same fate, so that we shall have no huge useless inert mass existing in after ages to remind the passer-by of a form of energy and a species of matter that is long since out of date and functionally effete. Why should not the universe bury its dead out of sight ?”

This bold conclusion is the culmination of the author's scientific argument. The use he makes of the ethereal world thus left upon his hands, with all its stored-up energy, is, if possible, more purely speculative still. In the first place, it has a *history* connected with that of the visible world, since by transfer of energy from the latter it is conditioned in time, direction, amount, etc., by the particulars which are now and here occurring. Every event here, then, is recorded by its traces on the invisible world, and these traces may be organized (it is not attempted to define how) into a memory. A possibility is thus afforded for a continuity of being, both conscious and material, between the two worlds, and our faith or fancy may

fill out its details in the way that seems most fitting. The author's aim simply is to explode the notion that science *debars* the supposition of such a continuity. He indulges in some further speculations about superhuman intelligences in that world, and concludes that it must contain an *immanent* intelligent agency which once determined the manner of formation of the visible universe from it, and impressed upon the molecules thereof that uniformity which Clerk-Maxwell calls the stamp of the "manufactured" article. This immanent agency is proved by Scripture to be the Second Person of the Trinity as distinguished from the First, who is transcendent.

The points which strike us most in the whole attempt are, first, the urgency of the author's demand for "continuity," or the principle of explaining one conditioned event by another conditioned event, and "pushing back the Great First Cause as far in time as possible," combined with his hopelessness of "driving the Creator out of the field altogether," and resulting in the compromise by which he gives us the Son as indwelling in the world, and merely determinative, not creative, of its molecular events, whilst the Father stays outside in inscrutable majesty, with apparently no function but to keep up logical appearances. Secondly, we are struck by the way in which he immediately resorts to teleology to determine the particular constitution of that unseen world of whose existence his previous arguments have established the probability. In a word, his tactics are in logical form precisely identical with those of the most primitive, "unscientific," and short-winded natural theologian, the only difference being in the scale of his operations. He shows us the same mechanical determinism in the line of events we clearly and familiarly apprehend, and he bounds the penumbra *a parte ante* in the same way by the Absolute Cause, and defines it *a parte post* by faith, guided by teleological reasoning. It is only the incomparable superiority of the modern scientific imagination on its *quantitative* side that may seem at first to give our author's speculations a different aspect.

And truly enough, if vastness of scale be a real character of the universe, both in space and time, those Hindu-like imaginations which are pleased with the contemplation of monstrous lengths, and are able to feel the difference between sums expressed in units of different orders of infinity, would seem the best fitted to divine its secrets. The German and English imaginations are fast being educated up to this spaciousness, whilst the French mind lags behind both in this point and in its feeling for continuity. Our author, therefore, may enjoy the credit of having attacked the problem of natural theology (and solved it in his way) on a scale not unworthy of the grandeur of the theme's dimensions.

But when he professes to have *mediated* between Science and Religion we cannot grant his claim. He simply gratifies the demands of science for an ever-wider scope, and thus throws upon religion a vaster task for her translating and interpreting powers. But his scientific unseen world is by no means identical with the world "behind the veil" of religion.

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Christian devoutness has never expressed its trust simply in "another," but always in "another *and a better* world." Our author's belief in the "betterness" of that "other" world which he constructs for us demands from him at the end of his mechanical gyrations, be they never so ingenious and rarefied, the same simple act of teleologic trust, the same faith that the end will crown the work, with which the most narrow-minded old woman so quickly envelops her briefly-recited cosmogony. We for our part not only hold that such an act of trust is licit, but we think, furthermore, that any one *to whom it makes a practical difference* (whether of motive to action or of mental peace) is in duty bound to make it. If "scientific" scruples withhold him from making it, this proves his intellect to have been simply sicklied o'er and paralyzed by scientific pursuits. In the physical realm the "subjective method" of finding truth may be the root of all evil. But the affirmation that this physical world has *also* a moral meaning and a moral plan is one that no argument drawn from purely physical truth can either establish or impugn. It is nevertheless an affirmation which either is or is not true, and which if true may, from the very nature of the case, be intended to command from us only that inward, free, or moral assent, or rather consent, in which the subjective method consists. As we have said, the 'Unseen Universe' does not make this consent essentially easier. It establishes no "continuity" whatever between mechanical reasoning about facts at our feet and teleological reasoning about ultimate things. But it widens the data and horizon which teleology receives from science, in accordance with the sentiment of the day; it will, doubtless, be found suggestive both by men of science and divines; and it deserves to be widely read.

SPIRITUALISM AND THE UNSEEN
UNIVERSE.

THE NOTTINGHAM JOURNAL,

AUGUST 16, 1876.

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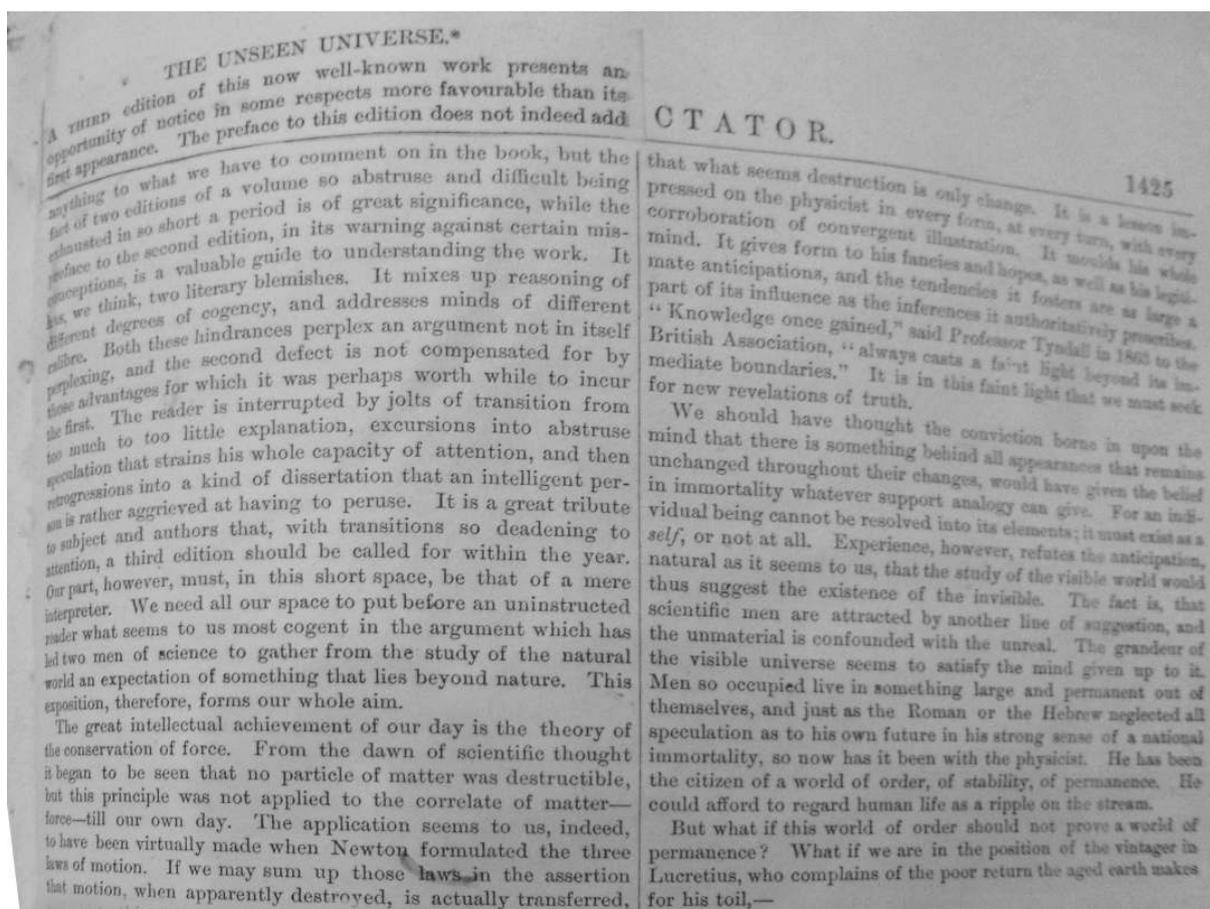
Some time ago the *Unseen Universe* (Macmillan and Co., London), which bore on the face of it evidence of scientific authorship, made its appearance before the public, but no one had the slightest idea as to the source from whence it came. Its general treatment of the character, vastness, and operations of the invisible were very bold and hazardous, yet worked out on evidently scientific principles, so that the critical world was very much awakened to an unusually searching examination of the work. Though dealt with scientifically there were many proofs that the writer's, or writers' object seemed to be to build around and exalt a belief in the authenticity of the Bible and the futurity which it teaches. To some extent this took off much of the weight that might otherwise have been put upon it in scientific quarters. The great aim of the author or authors is best explained in the following extract:—

“The great majority of mankind have always believed in some fashion in a life after death; many in the essential immortality of the soul; but it is certain that we find many disbelievers in such doctrines who yet retain the nobler attributes of humanity. It may, however, be questioned whether it be possible even to imagine the great bulk of our race to have lost their belief in a future state of existence, and yet to have retained the virtues of civilised and well-ordered communities. We have said that the disbelievers in such doctrines form a minority of the race; but at the same time it must be acknowledged that the strength of this minority has of late years greatly increased, so much so that at the present moment it numbers in its ranks not a few of the most intelligent, the most earnest, and the most virtuous of men.

It is, however, possible that, could we examine these, we should find them to be unwilling disbelievers, compelled by the working of their intellects to abandon the desire of their hearts, only after many struggles, and with much bitterness of spirit. Others, again, without absolutely abandoning all hope of a future existence, are yet full of doubt regarding it, and have settled down into the belief that we cannot come to any reasonable conclusion upon the subject. Now, these men can have had nothing to gain, but rather much to lose, in arriving at this result. It has been reached by them with reluctance, with misgivings, not without a certain kind of persecution, nor without the loss of friends and the stirring up of strife; still they have fearlessly looked things in the face, and have followed whithersoever they imagined they were led by facts, even to the brink of an abyss.* It is the object of the present volume to examine the intellectual process which has brought about such results, and we hope to be able to show not only that the conclusion at which these men have arrived is not justified by what we know of the physical universe, but that on the other hand there are many lines of thought which point very strongly towards an opposite conclusion."

Beginning first with the question as to belief we are furnished with the views held on immortality by the Ancient Egyptians, Hebrews, Greeks and Romans, the Mahomedans, down to the time of Christ, and the scientific Spiritualism of our time, pointing to the instinctive but crude character of this belief in early times, and the gradual growth and development of the mind which has produced the difficulties amongst the thinking people as to what reliance can be placed on recorded faiths and doctrines. With this class of people the writers begin to deal, and proceed at once to prove by a general minute scientific investigation of the unseen universe that the transformations of energy and force show that matter though indestructible, loses its power, and will eventually return to the invisible, so that immortality on earth is absolutely impossible. From this point we are lead to a treatise of what hope there can be of a life in the ethereal world. Here the writers enter scientifically into the substantiability of heat, ether, air, gas, &c., showing their power, their molecular character, &c., and argue that the intelligence of man may be of kindred nature, existing, though unobserved to natural eyes, in the whole molecular system, of which our bodies consist. The remainder of the book departs from science considerably and enters into the religious aspect of the supernatural. Altogether the work is one of the most exhaustive, as dealing with the whole subject, and wields a very heavy blow at materialism. Such an effect had the work upon the enlightened portion of the public, that the critics were very busily at work and some expressed their belief that the author or authors, whoever they might be, knew nothing of science; but this was at once crushed when the next

edition bore on its pages the names of Professors Balfour, Stewart, and Tait. The work has reached the fifth edition.



and add to this summary the definition of force as that unknown quality which lies behind motion, we may surely say that the idea of the indestructibility of force is contained in the *Principia*. The two centuries intervening between the implicit and explicit statement of this truth were necessary, however, for the transference of the imponderable agencies affording its illustrations from the domain of matter to that of motion, and the correlation of the physical forces received its first literary statement thirty-two years ago, in the lectures of one whose study of laws other than those of nature has always seemed to us a grievous loss to science. The principle then enunciated by Sir W. Grove has been illustrated, confirmed, and defined by every fresh discovery, and is now a common-place. Nevertheless, a familiar statement of its import may not be unnecessary.

The varied forces of nature must be pictured to the mind as a kind of alternate agitation between the small and the large divisions of matter, a ceaseless activity now concentrated on the movement of a single mass, now spent in sending thrills of palpitation through countless atoms. If our sense of sight were keen enough, we might see this interchange; under the present circumstances, it presents itself alternately to our eyes as movement, and to that unnamed sense in us which takes account of "warmth" or "chill" (words which we think it would be a great convenience to keep for our sensations, as "heat" and "cold" for their causes). We may bring a sort of pictorial representation of this change before our mind, by imagining what happens in a railway collision, the sudden cessation of movement in the large thing, the train, causing a clashing together of the smaller things, the human beings inside it. This is a pattern of the way movement passes from masses to molecules; make the train large enough, and the people inside small enough, and it becomes a specimen of such a change. When our feet strike the ground, movement is in just the same way transferred from a large thing to

a number of small things, for the sensation we know as warmth cannot, except as a sensation, be described in different terms. Just as a person watching a train stop suddenly would know nothing of any number of collisions inside, so movement vanishes to our eyes when it changes into the molecular form known as heat. And as a brisk walk may remind us that heat is transformed motion, a railway journey may remind us that motion is transformed heat. Motion—heat—motion again, thus we may, to uninitiated minds, condense the whole cycle of force which the scientific observer knows on a larger scale. Some fragment of this cycle forms the object of every scientific experiment, and he who is familiar with the whole realises vividly the truth denied by none, that force, like matter, can be transformed only, never annihilated. "The art of measurement," Socrates is made to say, in the *Protagoras*, "will teach us to do away with the art of appearances, and find rest in the truth;" and the great lesson of this unerring teacher is to verify, to the furthest decimal figure, the principle

"Nec tenet omnia paulatim tabescere et ira
Ad capulum spatio etatis defessa vetusto?"

Then what becomes of the sense of permanence fostered by the study of science? If all that we meet in nature forbids the thought of an absolute end, and yet certain indications prove that the whole physical universe is approaching its end, then will not the principle of continuity call upon us to recognise that here, as elsewhere, what seems destroyed is transformed?

At all events, this universe of order, of life, and to translate its Greek equivalent, of ornament, is approaching its end. We learn from this volume that "it is absolutely certain that physical life depends upon transformations of energy; it is also absolutely certain that age after age, the possibility of such transformations is becoming less and less, and so far as we yet know, the final state of the present universe must be an aggregation into one mass of all the matter it contains with uniform temperature throughout the mass." (pp. 91-92.) Why is this? Why cannot these transformations of energy go on for ever? Unless we are deluded by superficial knowledge, the answer given by our authors to this question is addressed to the scientific reader exclusively,—a great pity, it seems to us. No doubt the elaborate dissertation into which we are called upon to follow them may be quite necessary in order to satisfy a mind open to all possible objections. But a mind open to all possible objections is familiar with all the facts of the case, and it confuses the reader who has to learn both facts and arguments to set before him the train of reasoning necessary to bring home a particular conclusion to a mind needing only arguments. Whether or not the following translation is faithful, therefore, we are sure it is not superfluous.

No law of thought seems to us to have a wider range than what we would call the law of imperfect antithesis. Hardly anything in nature, in experience, in human life, is entirely antithetical, and it is in the slightly varying form we are obliged to give the

converse of any statement that we often find the most important bearings of the truth therein expressed. Motion is convertible into heat. Heat is convertible into motion. Keep clear of modification, and you may make one statement the converse of the other, but bring in defining terms, and this is impossible, for *all* motion may be changed to heat, and *some* heat only may be changed to motion. This mutual and unequal exchange is going on every day, every hour, every moment. Now as force can no more be created than it can be destroyed, there will be, apart from miracle, no more force in the universe millions of ages hence than there is now. But all that time one kind of force will be constantly changing itself into another kind of force, and at last it is evident the change must be accomplished, and all the force in the universe will be of one kind.

To understand the full bearing of this fact, we need only remember that what the very existence of organic nature depends on,—in fact, what the very word *natura* means—is transformation

of force. The simplest experiences show us as clearly as the most elaborate experiments that every time any force becomes manifest to our senses it is transformed. Again take the case of heat. What has happened when we warm ourselves? What does the sensation of warmth mean? If it were not for the sunshine, we should be forced to realise that every time we warmed ourselves something was expended. Two people feel cold on a winter's day; one takes a brisk walk, the other sits by the fire, but the empty coal-scuttle reminds the indolent person that in order to give him warmth something has had to give up its substance, apparently to give up its existence. Two different forces here have been changed into heat; the essential thing is the change. We might perish of cold in a coal-mine; the coal itself, apart from the change which combines it with the oxygen of the atmosphere, is valueless to us. And we must not suppose that the necessities of animal life are the only claims made on the transformableness of force. Every natural event is such a claim. In fact, nature is the transformation of force. This idea includes all the varying senses of that word. There is no part of nature that is not a transformation of force; there is no transformation of force that is not a part of nature. The supernatural, alike for those who believe and disbelieve in its existence, is the region above this cycle of interchange,—the region where something may be achieved and nothing expended, something given and not lost. And the region where this is impossible, whether in the world of matter or of spirit, is nature.

The want of perfect reciprocity between the various physical forces is, therefore, undermining the stability of our system. Heat will do no work, even in a theoretically perfect steam-engine, without squandering itself on the atmosphere all round it, and there is no corresponding liberality by which this lavish giver may be reinstated in the full working power thus lost, for we must remember that what we want to produce motion is not only heat, but unequal heat. We can get no more work out of equal heat than out of level water, and the

continual tendency of heat is to become equal. "Heat," say our authors, with epigrammatic felicity, "is, *par excellence*, the communist of our universe, and will no doubt ultimately bring the system to an end." For this want of reciprocity between heat and movement is not confined to our globe; the sun himself is squandering his heat, and must change first to an icy mass, then to the material of a new conflagration, then, again, to the particle of a new cold globe, exceeding it in vastness as much as our globe exceeds a clod of earth, and then, perhaps, if we have rightly understood the authors' views of matter and ether, into an invisible and intangible form.

We find ourselves, then, face to face with an ultimate destruction of the universe:—

"All worldly shapes must melt in gloom,
The Sun himself must die,"

has become a teaching of science. The dream of poets has become the certainty of physicists. The day draws near when "the heavens shall pass away with a great noise, and the elements shall melt with fervent heat; the earth also, and the works that are therein shall be destroyed." No doubt, we are separated from that event by millions of ages, still *those millions of ages will pass*.

Now what the study of nature impresses indelibly on the mind is the lesson that nothing is lost. Destruction to the man of science means change. The end of one thing means the beginning of another. Where the stream vanishes beneath the earth he, like another Alpheus, is ready to follow his Arethusa to her escape, whether under a colder or a brighter sky. When he learns, therefore, that all that we mean by nature is hastening to its tomb, can he make the fate of nature one vast exception to the whole teaching of nature? Or may we not say, somewhat exaggerating our authors' over-timid statement of their aim, that the laws and the

lieve, is the largest agent in all change of belief. "I refused to listen to this *kind* of evidence yesterday, and was wrong,—had I not better try to-day if it proves a true guide?" is the form generally assumed by the reasoning, conscious or unconscious, of all those who have sufficient depth of character to profit by the teaching of experience. Analogy may be a deceitful guide, as we are reminded by one who has profited most from it, and at the strongest, it never rises to certainty. Still it is the intellectual inlet to all new truth. The mistakes and successes of thinkers alike remind us that it is the seed of science. When Comte forbade the attempt to assimilate the laws of light and of motion, he was, like some of our authors' critics, restricting a generalisation to a set of phenomena beyond which he knew of nothing but analogy to extend it. When Newton first endeavoured to assimilate the laws of weight and of planetary motion, he was, like our authors, extending a generalisation to a set of phenomena beyond which he knew of nothing but analogy to extend it. Of course, while the theory of gravitation, for instance, rested on analogy, it was not a part of science properly so called, and it is at this stage that we must compare it with the view under notice. But still the extension of a principle found to hold good on this earth to the heavenly bodies before the discovery of any property common to both, is exactly parallel to that extension of the principle of continuity to a region other than that of nature which is attempted in this volume.

Do we, then, anticipate that our author's suggestion will ever take its place, for instance, beside the theory of gravitation? We have no such anticipation for any theory that assumes the existence of a spiritual world. As long as it is possible to ignore all direct evidence for such a world, so long will it be possible to declare all indirect evidence fallacious. Not thinking a conclusive argument possible, we do not think the present a failure because it is something less. We are not prepared to say exactly what it is worth. The idea of the destruction of the universe is too new and too large for any one to attempt to measure its influence on

thought. It will, we believe, ultimately shut in the instinct that seeks permanence to some non-physical region; it will make men ready to listen to every whisper that tells of an enduring world other than this, which we know of through our eyes and ears. Just as the decay of national life during the first preaching of Christianity developed the sense of individual immortality, by detaching this instinct of continuity from the national life which had hitherto satisfied it, so we believe this wider sentence of destruction will prepare many ears to listen for a new promise of resurrection. On those who hear no such faint whisper anywhere, we do not suppose this argument, or any of like nature, will have any effect whatever.

AN AUSTRALIAN NOVELIST.*

We can hardly recommend ordinary readers of fiction to get and peruse the terrible and tragic story of an innocent convict's life, which Mr. Marcus Clarke has here told for us, with a grim fidelity to the natural history of convict ships and penal settlements which is as revolting as it is unquestionably powerful. From the first chapter, in which the 'Malabar' sets sail with her crew of wretched malefactors for Hobart Town, to the last, in which the innocent convict escapes from his torture-prison only to find his fate in the foundering of the 'Lady Franklin,' Mr. Marcus Clarke paints for us with a frightful realism, which makes it impossible not to see vividly the scenes he describes, the incidents of a society in which crime and vice, crowded together in foul decomposing masses, fester and ferment on the one side, and coarse authority, petrified by routine into hardness and indifference, or brutal and insolent courage, proud of its unflinching nerve in the presence of cowering guilt, tyrannises and tramples on the other side. Mr. Clarke's familiarity with all the most humble details of

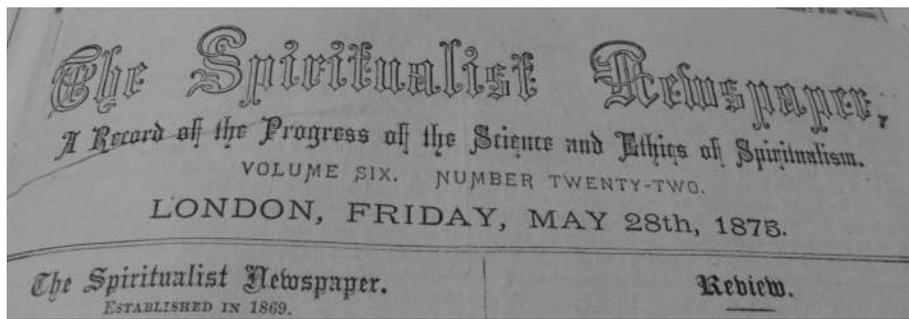
prospective fate of the visible universe together suggest the belief in one which is invisible?

If it be asked,—What is an argument worth which can be stated only as a suggestion? we should concede that it proved nothing in either a mathematician's or a lawyer's sense of proof. But we should urge that most of the considerations which induce deep and abiding belief are not proof in this sense. No book is richer in such suggestions than Butler's *Analogy*, but it proves nothing to the mere logical ear. It is hardly fair to the work under notice to compare it with one so mature and thoroughly thought out, but the most different kinds of intellectual effort may be grouped together when the aim is alike, and the present work, no less than its immortal predecessor, is an effort to show that the "Constitution and the Course of Nature" presents an analogy to something outside nature. Analogy, we be-

the life of a penal settlement is far too minute, and his power of reproducing them far too graphic, to render this powerful book fit for general perusal. It ought, however, to be read by all who, while they care for literary power, are not afraid of grim detail, and by all who still advocate the establishment of penal settlements at a distance from the wholesome influence of an opinion which has neither grown apathetic through long habit to the horror of crime, nor incredulous of the hope of humanising the outcasts of society. It should be translated into French, for the warning of those French statesmen who are developing the penal settlement in New Caledonia, and read by the Indian statesmen who are creating in Port Blair "a Port Arthur filled with Indian men, instead of Englishmen." It is next to impossible that any penal settlement

* *His Natural Life*. By Marcus Clarke. 3 vols. London: Bentley and Son. 1875. Another Edition. Melbourne: George Robertson. 1874.

21 *The Spiritualist Newspaper*—May 28, 1875



Review.

The Unseen Universe; or, Physical Speculations on a Future State. London: Macmillan and Co. 1875.

A STRONG impression prevails among Scotch readers of this journal that this thoughtful book has been written by Spiritualists in disguise, for so much of the work as has been quoted in a review in the *Scotsman* sets forth all the first principles of Spiritualism, adulterated with a little dogmatic theology. But the authors are not Spiritualists, and it will be breaking no confidence to state that the *Athenæum* has published that the book is written by two fellows of the Royal Society—Dr. Balfour Stewart, of Manchester, and Mr. P. G. Tait, Professor of Natural Philosophy at the University of Edinburgh.

There is a tendency in the human mind not to rest upon the things of earth, but to attempt to pierce the mystery which lies beyond the shadowy veil cutting off the view of the unseen world. The statesman, the philosopher, the poet, those who have achieved greatness and attained the honourable elevation they sought in this life, see the real emptiness of those baubles for which most men strive, so they turn aside from the things of time to consider the things of eternity, and to speculate upon the mystery of existence. Consequently Professor Huxley quits for a time the stones and bones of past ages to give a casting vote at the Royal Institution against materialism, and in favour of the idealism of Berkeley; Professor Tyndall quits his batteries and lanterns to speculate at Belfast upon the origin and destiny of man, and the press now teems with books written under impulses of the same kind. Dr. Balfour

Stewart, who has stepped aside from the study of physics to take part in writing the present book, is Professor of Natural Philosophy at Owen's College, Manchester. He was formerly Superintendent of the British Association Observatory at Kew ; he has written standard scientific books for Oxford University, and all his life has been a deep and earnest student of the works of nature, from which labour he has never turned aside either in search of social precedence or worldly gain. Both upon its own merits and the respect felt for its authors by the scientific world, the book now before us will command widespread attention.

Having no desire to be captious, stress will not be laid by us upon the bull contained in the title of the book, except to remark that a "physical speculation" must be first cousin to an "imponderable weight." The book displays a deep knowledge of physical science, far too deep to be slighted by the intellectual world ; and, on the other hand, it breathes true natural spirituality. Reasoning from a purely physical standpoint, the authors come to the conclusion that the visible universe must have been developed by an unseen power, because, if the living being is traced back to the primal germ assumed by the sceptical biologist,

or to the ultimate atom of the physicist, the question may yet be asked, whence came that germ, or whence came that atom? It is the old story of the Hindoo placing the world upon the back of a snake, and the snake upon the back of a tortoise, and the tortoise upon the back of an elephant, but having nothing left for the elephant to stand upon, the whole speculation fell to the ground for want of a foundation. The authors do well to admit the theories of materialists so far as they go, without denial, but to join issue with them over the facts lying at the boundaries of their knowledge.

Messrs. Tait and Stewart adopt the hypothesis of dissipation of energy. In the present solar system degradation of energy is seen in all directions. The evidence is strong that the sun is slowly cooling, and that the forces of nature are gradually sinking into a state of equilibrium in relation to each other. The authors argue that our visible universe was brought into existence in time by a creative act, or must have been developed out of a previously existing universe. The latter may still exist, and be destined to survive the wreck and ruin of the visible creation of the present. The authors speculate whether there may not be a something within man which survives the things of matter, and they raise the question whether the assumed interstellar ether does not constitute the bond of connection between the universe which is seen and that which is not seen. In this way do they furnish man with a spiritual body over which death has no power. They say:—

"Let us, therefore, begin by supposing that we possess a frame, or the rudiments of a frame, connecting us with the invisible universe, which we may call the spiritual body. Now, each thought that we think is accompanied by certain molecular motions and displacements in the brain, and parts of these, let us allow, are in some way stored up in that organ, so as to produce our material or physical memory. Other parts of these motions are, however, communicated to the spiritual or invisible body, and are there stored up, forming a memory which may be made use of when that body is free to exercise its functions. Again, one of the arguments which proves the existence of the invisible universe demands that it shall be full of energy when the present universe is defunct. We can, therefore, very well imagine that after death, when the spiritual body is free to exercise its functions, it may be replete with energy, and have eminently the power of action in the present, retaining also, as we have shown above, a hold upon the past, inasmuch as the memory of past events has been stored up in it, and thus preserving the two essential requisites of a continuous intelligent existence."

The men who could pen such a sentence as this were very naturally supposed by the Scotch readers of these pages to be Spiritualists, the only difference between the authors and Spiritualists being that we are able to prove by experiment the position which they have taken up, whereas they have no better foundation to rest upon than hazy speculations evolved in part from their own inner consciousness. They have departed from the principles laid down by Bacon, whilst Spiritualists are walking in the experimental and orthodox paths of science so far as this subject is concerned.

The facts of Spiritualism, which alone can prove the position taken up by the authors, are dealt with in a summary fashion in five short paragraphs of the book now under notice. They begin by calling these facts "pretensions," and then go on to assert that the spirits described in the Scriptures are represented as appearing to men unprepared to receive them, and consequently were attested by unbiassed witnesses, the most glaring case of the kind narrated in the Bible, namely, that of the appearance of Samuel in the presence of the witch of

Ender having unaccountably escaped their attention. On the other hand, they say that the manifestations recorded by Spiritualists take place, as a rule, in insufficient light or in total darkness, and in the presence of those who are in a state of mental excitement. If our two authors have read anything at all about Spiritualism, we should suppose they have read the works of their brother fellow of the Royal Society, Mr. W. Crookes. If so, they will see that he records that he has photographed materialised spirits by the electric light; probably they mean this method of illumination when they say 'insufficient light or total darkness.' As to the other statement, that the manifestations take place in the presence of persons who are in a state of mental excitement, all that can be said is, that we have been present when Dr. Balfour Stewart has tried experiments at Kew with his rotating disc in vacuo; we have also been present when Mr. Crookes tried some of his experiments with materialised spirits, and our testimony is that Dr. Balfour Stewart was rather the more excited experimentalist of the two. Mr. Crookes had the pressure of popular abuse and ignorance to work against, consequently was all the more cool and cautious in making his experiments.

Further, if certain manifestations—especially those with partially developed mediums—are favoured by subdued light, is that a reason that they are not to be investigated? If night favours astronomical observations, is that a reason why stellar phenomena should be studied only by daylight? To be consistent, Messrs. Stewart and Tait should send a circular to all the astronomical observatories in the kingdom, warning their managers to make no observations except in broad daylight, and arguing that anything seen by an astronomer who prepares himself to observe the same shall be set on one side as unworthy of credit. For thus say our two philosophers: "We should not be disposed to credit any communication from the world of spirits that was not made in open daylight, and to those unprepared to receive it and therefore unprejudiced."

And what is the conclusion of these two intelligent philosophers about Spiritualism? They "do not hesitate," they say, "to regard these pretended manifestations as having no objective reality." Now it so happens that the Committee of the Dialectical Society, consisting of educated professional men,—lawyers, architects, literary men, and men of science,—after investigating the phenomena for two years, reported that they had an objective reality. Further, the colleague of Messrs. Tait and Stewart, Mr. Crookes, has in his book registered the vibrations of the raps and of the physical forces at work, by means of self-recording instruments constructed on the same principle as those used by Dr. Stewart at Kew to automatically register magnetic variations; consequently the position assumed by our two authors is virtually that of giving a rude denial to the testimony of truthful people. If the Royal Society told Dr. Stewart that his experiments with his rotating disc never took place, but were a dream, and that the experiments of Professor Tait on the thermo-conductivity of metals had no objective reality, but were the result of visions produced by dinners of a less abstemious character than those which enlivened the members of the British Association at Edinburgh, they would both be treated as fairly and honourably as they have treated Spiritualism; but there would be this difference between the two cases—the proved results of their experiments would be of small importance to the

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THE SPIRITUALIST.

world, whereas the facts of Spiritualism prove that man has a life hereafter; they also affect the religious opinions as well as the daily life of every member of the human race.

Swedenborg was one of the greatest mediums of modern times, and at the hands of the two gentlemen who have written this book he fares very little better than Spiritualists. The authors say—"Had Swedenborg confined himself to the invisible world, it would have been very difficult to prove him the subject of a delusion, but when he visits the planets and describes their inhabitants, he enters at once upon dangerous ground." They then go on to show the almost conclusive evidence that Swedenborg was wrong in some of his revelations about the planets, just as this journal has shown that the revelations about the physical universe given through trance mediums can in most cases be proved to be not only erroneous but sometimes the very reverse of truth. Granting all this, why do not Messrs. Stewart and Tait carry out their own line of argument so as to deal fairly and honourably with Swedenborg? If they appeal to erroneous revelations about physical facts, why do they not also call attention to those which were not erroneous? Take the well-known fact, printed in nearly every book about Swedenborg, how on the 19th of July, 1759, the seer landed at Gottenburg, and at six o'clock in the afternoon told no less a person than the philosopher Kant that a dangerous fire had broken out in Stockholm and was spreading fast. Stockholm is 300 miles from Gottenburg, and in those days there were no telegraphs. Swedenborg further said that the house of one of his friends whom he named was in ashes, and that his own home was in danger. At eight o'clock he exclaimed, "Thank God, the fire is extinguished the third door from my house." All this afterwards proved to be true. Why do not Messrs. Stewart and Tait deal fairly with the facts, and not, like sharp lawyers, pick out those only which serve their purpose? By what right also do the authors brow-beat witnesses by intimating that self-recording instruments made on the same principle as those used by Dr. Stewart himself at Kew did not register objective realities, but dreams? By what right does Dr. Stewart say by implication that his near neighbour, Mr. Charles Blackburn, of Parkfield, Didsbury, Manchester, was not recording an objective reality when he stated in these pages that a tape knotted round the neck of Mrs. Corner (Florence Cook), and sealed at the neck with a signet ring, was removed at a seance in the house of Mr. Wm. Crookes without being cut, or the knots or seals broken, although the loop of the tape fitted close to the neck and would not pass over the head of the medium? He may argue that the admission of such a fact would put mankind into a state of intellectual confusion, whereas the argument should be that it would put *him* into a state of intellectual confusion because he does not yet know all the laws of nature. Would not the facts of electric telegraphy put a savage into a state of intellectual confusion? If so, does that prove that electric telegraphs have no objective reality? Dr. Stewart has written much and thought more about the impenetrability of matter, yet when a practical illustration bearing upon this all-important subject is published, he throws cold water upon the witnesses, and gives unreliable information about such phenomena to the public, in one of the most important books he ever published in his life. The truth of the matter, in all probability, is, that the two pages about Spiritualism in

the work before us were written by Professor Tait, and not by Dr. Hailour Stewart. The fairest and most unbiassed article ever written by any man who had not inquired into Spiritualism was that printed by Dr. Stewart, and published in *Nature* at the time when the British Association met at Edinburgh. Yet two pages in the present book are written in direct opposition to the spirit permeating that article, hence those pages were in all probability written by Professor Tait. Nor is it a small thing that the authorship of the column should be fixed upon the right person. For the present day whilst Spiritualism is unpopular (except in well-informed and highly intellectual circles) cannot may be gained from the ignorant by condemning its truths, a book by such intelligent men will also have to be judged in the light of history when we have to present drama shall have departed into the unseen world. In that future time the crude speculations in the book before us will be explained by solved problems, and the writers of that day will tell how Messrs. Stewart and Tait thrust aside the facts which would have proved the immortality of man, how they misrepresented truth to the general public, how they misrepresented the position of a half-developed Galileo who took up the earth rotated upon its axis, but who argued that the telescope and other instruments which could prove the same were delusions and snares, and who further asserted that the phenomena of the heavens which the alleged telescope revealed had no objective reality. Messrs. Stewart and Tait have never inquired into Spiritualism for themselves; they are much in the position of the professor of philosophy at Pisa who refused to look through the telescope of Galileo, but most learnedly argued that the things revealed by his telescope had no actual existence.

Throughout this book, by a process of pure reasoning, based upon the knowledge of the authors of the nature of the physical universe, certain true conclusions are arrived at in relation to the spirit world, the only thing necessary to clinch the arguments being some of the proved truths of Spiritualism. For instance, they say that some of the passages in Scripture must be regarded as figurative, and they add, "May they not be descriptions of what takes place in the unseen universe brought home to our minds by means of perfectly true comparisons and things of this universe which they most resemble?" The truth of this idea has long been practically ascertained by Spiritualists, and has led to long discussions on the symbolical nature of spirit writings and spirit drawings. In Mrs. De Morgan's book, *From Matter to Spirit*, published by Longmans, attention is called to different spirit drawings, all teaching the same truth through varying symbols. Again the authors say: "We cannot easily agree with those who would limit the existence of evil to the present world." This again is well known in Spiritualism to be a proved truth, for all kinds and conditions of spirits put in an appearance, some of the highest greatness and goodness, whilst others are of the lowest type.

On page 163, speaking of the human spirit, they say: "Even if trammelled by the grossest substance, we might expect that at least on rare occasions it should somehow manifest itself." Here, then, they state what their theory demands, and what the facts of Spiritualism alone can prove. They argue that there must be a spirit within man, and that this survives the dissolution of the physical body, yet proclaim that the phenomena of Spiritualism have no objective reality.

quite forgetting that on page 25 they admit that St. Paul once saw a ghost, and that he attached much importance to this proof of the possibility of resurrection. Now, St. Paul must have seen this spirit by one of two methods: either he became clairvoyant and saw with spiritual vision, in which case clairvoyance is a truth, or the spirit materialised itself by some such method as that now common in London. Without one or the other of these processes, both known to Spiritualists to be realities, St. Paul could not have seen the spirit: yet the only methods by which he could have seen the apparition are denied to exist by the authors of the book before us.

The question of miracles is also a difficult one for our two authors, especially when it is considered that their utterances are to be criticised by the scientific world. They will not admit for a moment that Christ was above law, for He spoke of Himself and was spoken of by the apostles as bound in all respects by the law of the universe; so Messrs. Stewart and Tait fall back with some modification upon the old explanation of the action of Mr. Babbage's calculating machine, which, after having worked for a long time by a particular method of procedure, suddenly manifested a single breach in its method, and then resumed for ever afterwards its original movement. This is not the method by which men of science usually deal with the facts of the physical universe. They usually verify or throw aside the assertions of tradition by bringing to bear upon them the more general knowledge of to-day. The laws which produced the true spiritual phenomena recorded in the Bible are at work now. The influences which produced the hand-writing upon the wall at Belshazzar's feast are equally potent at the present day, materialised spirit hands which do direct spirit writing being common enough. Yet our authors accept without question traditionary records, and deny the reality of the same facts when they now occur in the presence of their most intimate friends.

Towards the close of the book the authors say:—

"The truth is, that science and religion neither are nor can be two fields of knowledge with no possible communication between them. Such an hypothesis is simply absurd. There is undoubtedly an avenue leading from the one to the other, but this avenue is through the unseen universe, and unfortunately it has been walled up and ticketed, 'No road this way,' professedly alike in the name of science at one end and in the name of religion at the other."

Most of the scientific opinions about the spiritual nature of man expressed in the book will be proved hereafter to be true, but proved only by the facts of Spiritualism. One reason why the authors cannot prove their position at present is that they have unfortunately walled up the avenue to the unseen universe, and virtually ticketed it—"No road this way: (Signed) STEWART and TAIT." The book might be made a very good one if some intelligent Spiritualist would revise it, beginning by cutting out the few pages about Spiritualism and Swedenborgianism, by adding a chapter about the philosophy of Berkeley, by inserting observed facts where the authors seek to prove their points by metaphysical speculations, and by ruling the far-fetched "calculating machine" argument out of court, substituting the ordinary course of nature and the usual scientific method of dealing with traditionary accounts of real phenomena. The book should then be rechristened "The Physical Aspects of the Phenomena of Spiritualism," and would be a valuable addition to the literature of the movement.

CURIOUS PHASES OF WITCHCRAFT.

"A chronicle

Of strange, and secret, and forgotten things."

Shelley.

The intelligence styling itself "Imperator" has intimated in these pages that there have been times and seasons in history when the millions of spiritual creatures that walk the earth unseen, ordinarily, both when we wake and we sleep, have through unknown causes been permitted to draw nearer to human kind, manifest themselves more palpably, and interfere more intimately in mortal affairs. Such periods are mystically referred to by the most transcendental author of this century, reflecting the secret love of Platonic ages—

Unknown—albeit lying near—
To men the path to the demon sphere;
And they that swiftly come and go,
Leave no track on the heavenly snow.
Sometimes the airy synod bends,
And the mighty choir descends,
And the brains of men thenceforth,
In crowded and in still resorts,
Teem with unwonted thoughts.
When close above their heads
The potent plain of demons spreads;
Stands to each human soul its own,
For watch, and word, and furtherance
In the shares of Nature's dance.

These ideas present themselves in the earliest human records, run through the primeval mythologies, and enter under many shapes into the traditions and superstitions of almost every race. In the beginning of days it is written that the sons of God saw the daughters of men that they were fair; and they took them wives of all which they chose. This, it is intimated, led to immeasurable evil and wickedness. It were idle to speculate too curiously on the condition of those dim inconceivably distant ages, of which Egyptian papyri and Babylonian cylinders are but now disclosing some hint. Some think there are traces yet on earth of great and long-continued civilisations that arose when her surface presented other features and configurations of sea and land than now. In desert countries there are mighty ruins and monuments of human toil, for which even tradition has no rumour, and vestiges of the long-drowned Atlantis may possibly yet be recognised above the waves. Cloud-capt towers, gorgeous palaces and states, and all that inherited and made them—none can tell how great—may have dissolved and left no track behind; and none can say how close the "demon sphere" and the "sons of God" may have stood to those unknown generations.

But in the first dim light of history the idea and belief in the possibility of close communion between the inhabitants of the earthly and spiritual worlds is found prevalent—such communion as Genesis describes. All know how much of the Greek religion and worship was based on the intercourse of gods and mortals; the heroes and semi-divine personages, around whom the most glorious poetry in the world has crystallised, were the offspring of the gods by mortals. The Greek mind saw nothing strange in the spiritual inhabitants of the Olympian sphere seeking the daughters of men, nor in children springing from such union. Men pre-eminently great were indeed certain to have an origin ascribed to superhuman parentage. Alexander of Macedon claimed Jupiter for his sire. Plato was reputed the child of Apollo, born of the virgin Perictione. Who can surmise in what events, or traditions of events, reaching backwards—perhaps to the

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THE UNSEEN UNIVERSE; OR, PHYSICAL SPECULATIONS
ON A FUTURE STATE.

Three Lectures by JOHN PAGE HOPPS.

I.

It is a peculiarity of my Church teaching, that I think it is a useful and proper thing to occasionally bring before my hearers some leading book of the day bearing upon the progress of scientific and religious thought, and upon our researches as students of human nature, and of the links that unite the unseen and the seen. In the prosecution of this aim, I have always been untrammelled and impartial; or, if I have favoured either side, it has been to give a special hearing to Strauss or Tyndall—to Huxley and Stuart Mill.

The book before us to-day is, however, a voice from the other side. Its authors are, fortunately, men of science—Professor P. G. Tait of Edinburgh, and Professor Balfour Stewart of Manchester. (These names appeared in an early advertisement of the book.) They are not satisfied with the emphatic denials of Strauss, the cloud-land dissolving views of Tyndall, the jaunty know-nothingism of Huxley, or the gloomy vacancies of Mill: still less are they satisfied with the icy negations of Spencer, or the juvenile audacities of Clifford. They believe in God, they believe in a life beyond for man, they think they have scientific bases for their belief; and in this book we have the intensely promising subject discussed—“*physical speculations on a future state.*”

I speak with emphasis for myself when I call that an “intensely promising subject,” having been long looking for light in that direction, and being now more persuaded than ever that we must look to the man of science rather than to the divine for an introduction to the spirit behind the flesh. The popular pulpit appears to me to be well-nigh “played out” on the question of a future life. It has quoted all its texts, it has stated all its hopes, it has expounded all its arguments, it has recited all its poetry, it has laid before us all its proofs; and when we have put together the whole mass, the utmost we can extract is a plausible expectation, a cheering hope, or a pleasant dream. We are still left with the childish picture of a heaven of harps and spangles, and a hell of fires and devils; or with a belief in a resurrection of dead bodies

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at a future judgment day. The result is a wide-spread, but as yet partly unconscious and partly unexpressed, disbelief in anything worthy to be called—Life beyond the grave. Nor is this disbelief confined to men of the world, to men of science, to so-called “infidels,” or to the utterly careless. I have come to a clear conviction that, even among persons supposed to be believers, there is very little that deserves to be called conviction. There is a little genuine trust, a great deal of sentimental hope, a large amount of vague expectation or awe-struck sense of mystery, but a very little downright belief in actual continuity of being beyond what is called *death*. The proof of this is, that if you calmly and in measured terms talk about the dead as being alive, if you discard the cant terms, and speak of the dead, not as “immortal souls,” “angels,” and the like, but as men, women, and children; if you describe them as doing things that men, women, and children would be likely to do; if, in short, you accept people’s own statements, and treat the dead as really *alive*, you either startle, or irritate, or shock these imaginary believers; and you find that their so-called faith in a future life belongs to cloud-land, and that its leading characteristics are incoherency, unreality, or thin grey haze. It appears to me, therefore, that we are in urgent need of help, and that help can only be looked for from the laboratory, from the man of science, from experiment, from a deeper knowledge of the world that lies about us, and of the being we have been calling *Man*. The divine talks about the natural and supernatural, law and miracle, human and divine. The man of science will help us to abolish these distinctions, which are really only expressions of our ignorance and definitions of our limitations. He will shew us that everything is *natural*, that everything is within the circle of *law*. He will correct the vulgar error that when we know everything about flesh and blood we know everything about *Man*, and that when we have weighed and measured and dissected the atoms we know everything about the *Universe*. He will shew us that we must look for God, and the spirit of man, and the unseen world, in the old path,—the path of orderly procedure, the path of law, the path of demonstrable experiment. He will shew us that if man is ever to be an immortal spirit, he is an immortal spirit *now*; that if there is an unseen world, that world is *here*; and that if ever so-called miracles occurred, these also must be included in the mighty sphere of law, though of law as yet uncomprehended and unmastered by us,—law unfamiliar, law as yet beyond the ordinary bounds and experiences of life, but none the less law for that,—perhaps a temporary inflowing of the unseen forces into the sphere of the seen,—an inroad of spirit upon matter,—a manipulation of the weak by the strong, of the dead by the living, of the gross by the ethereal, but all in harmony with eternal law. These thoughts will at once explain my deep interest in a scientific work on “The Unseen Universe,” containing “physical speculations on a future state,” and will prepare the way for the exposition I have to give.

I must, however, first observe, that, with every anxiety to set a very high value on the book before us, it has in no slight degree disappointed me as a literary work. To begin with, it is, on the whole, badly written. Here and there we come across a well-expressed, pointed, telling paragraph, but too often the style is weak and the arrangement perplexing. The 258 numbered paragraphs of which the book consists, are far from being consecutive and orderly. We are taken, in a jerky fashion, from point to point, and through a kind of note-book which has not yet had the advantage of careful revision and arrangement. The result is a curious compound of severe science and third-rate poetry, profound suggestion and crude quotation, Glauber's salt and the Trinity, immortality and engines, scraps of hymns and fragments of texts, commonplace sketches of ancient beliefs and painfully technical descriptions of modern mechanism, put together with a grave juvenile air of accurate measurement, and with reiterated statements that everything is being done fully. Another source of disappointment is the disproportion between the space given to historical sketches, theological descriptions, textual criticisms, laboured scientific detail, and hymns, on the one hand, and "physical speculations on a future state," on the other hand. We read on and on, grudging the space gone as we turn each leaf, and wondering when the curtain is to be lifted. This is done towards the end, but when only a few pages remain; and in these, to our horror, we find Sunday-school hymns! A still graver source of disappointment, however, is the authors' treatment of Christ and what they call "Revelation." They use, on their very first page, the more than questionable phrase that "the Creator of the Universe is Himself the Author of Revelation;" and, in approaching the very heart of the problem before them, just at the very moment when our attention is quickened to the very utmost, we come across the intensely disappointing statement: "We cannot do better than consult the Christian records"! I am not prejudging the question whether the Bible is a "Revelation" from "the Creator of the universe," or whether "the Christian records" are an authority on a semi-scientific subject; I only say that, in such a work as this, the references to them are out of place, and that the appeal to them is neither scientific nor satisfactory. In a scientific work of "physical speculations," it is almost ridiculous, it is altogether inappropriate to "consult the Christian records;" and this I should say even though I believed in their infallibility; for, in science, we know experiments, not authorities; proofs, not quotations; demonstration, not revelation. We have the same objection to the authors' treatment of Christ, when they refer to him as the "incarnation of the second Person of the Trinity," and assume that his relation to the universe was "different from that of any mere man." All that may be true or false, but it is utterly out of place in a scientific work, and is apt both to mislead and to seriously weaken the really strong parts of the book.

I have thought it right to refer to these grave defects, partly because I hope to be able to reach these writers and some others who may be disposed to work in the field they have opened up, and because it may be that these words may help to keep the subject within proper limits; partly because I want you to appreciate my impartiality, when I come to speak warmly in praise of the book; and partly, I may say chiefly, because I wish to report fully and faithfully what I find.

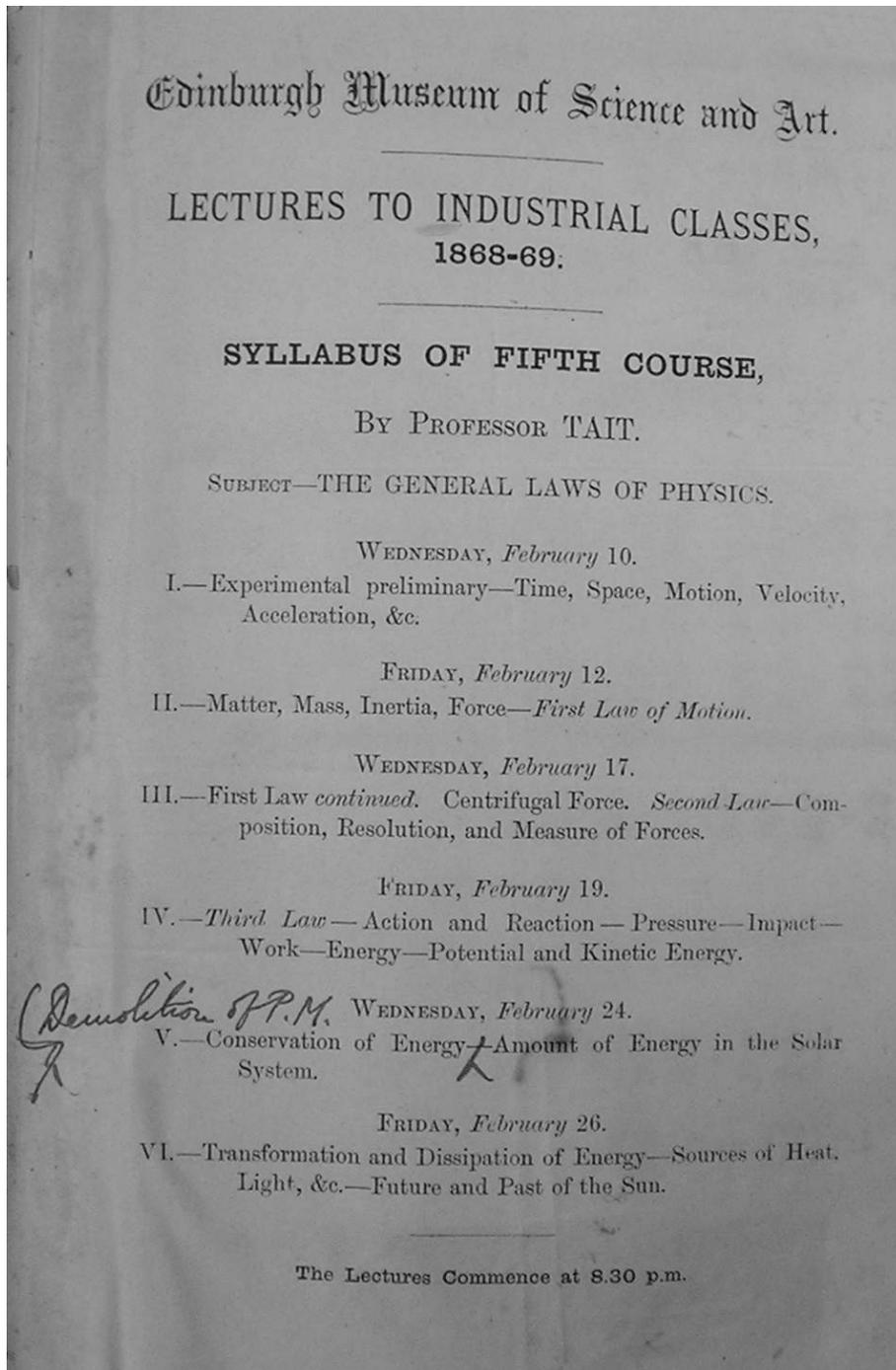
In proceeding to the subject of the book, we are met by a preliminary objection, which is splendidly met by our authors. "What," it may be said, "what have we to do with the 'unseen' ? Why pry into that which God or Nature has hidden ?" But this might have been urged against any purely scientific study, and if listened to would have barred the way to all knowledge and advancement. Referring to certain astronomical discoveries, our author says, "In this triumphal march, the progress has always been from the less to the more perfect, from the glimmering of early dawn to the clear morning light, if not to the bright beams of the noonday sun. Temporary obstacles have appeared, only to be surmounted, and, like Augustine's ladder, to constitute a platform from which a higher and more comprehensive view might be obtained." This is a capital reply to the objection—"Why pry into what God has hidden ?" It is an equally good reply to those who fancy we know all there is to know, and who scornfully talk of the impossible. Farther on, there is another reference to this objection, when what are called "miracles" are in question, and the passage will show how luminously these writers *can* put a thought:—"Undoubtedly," they say, "we cannot permit certain events to be set aside by merely human authority as questions into which it is deemed unprofitable or useless for our reason to pry; nay, we are tempted to advance even further than this, and to assert that it constitutes our duty as well as our privilege to do our best to grasp the meaning of all events that come before us. Do not all terrestrial occurrences of whatever nature form that material upon which the intellect of man is intended to work—that earth which man is commanded to subdue—a command equivalent to victory ?" And, almost as their closing words, these thoughtful lines occur:—"The truth is, that science and religion neither are nor can be two fields of knowledge with no possible communication between them. Such an hypothesis is simply absurd. There is undoubtedly an avenue leading from the one to the other, but this avenue is through the unseen universe, and unfortunately it has been walled up and ticketed with '*No road this way*,' professedly alike in the name of science at the one end, and in the name of religion at the other." There is great good sense, as well as timely wisdom, in this; and it is as good against Science militant as it is against Theology triumphant. Theology triumphant says, "Shut your eyes and believe:" Science militant cries, "There is nothing to see." Both need to be told that our business is to *inquire*. To the one we say,

—All paths are open, no questions are closed. To the other we say,—We know nothing of the impossible; we put no limit to inquiry; neither do we draw lines about the knowable. We are for freedom; but freedom cannot be while there is denunciation on the one hand and scorn on the other,—while Theology declares that investigation is a sin, and Science shouts that it is absurd or vain.

I shall conclude this preliminary lecture with an anticipatory glance at the leading result arrived at by these writers. That result is well and briefly expressed in a sentence of their own, that “a life for the unseen, *through* the unseen, is to be regarded as the only perfect life.” This is true in two senses: first, in the sense with which the book is directly concerned—that all life *proceeds* from the unseen; and second, in the sense that all life *tends* to the unseen. It will be my main object to keep this in view in my exposition, for the purpose, on the one hand, of showing, “by strict reasoning on purely scientific grounds,” that the unseen universe is a tremendous reality, and, on the other hand, of fixing attention upon the true end of life, which, if immortality be true and no dream, can only be the development of mental and moral character, and the working for *spiritual* results. The “scientific grounds” upon which the belief in the unseen universe is based will be described in my next lecture: suffice it now to say that no human being has ever found in the physical laws and resources of the universe an explanation of the mighty mystery of *life*. The very broadening of scientific boundaries which, in modern times, seems to threaten all our old theologies, silences, at the same time, the materialist by the presentation of fresh problems of overpowering gravity, and the bringing into view of vast fields of thought, before which the man of science might well put his hand upon his mouth, as did the ancient seekers after God when they approached what they believed to be the glory of His presence. Professor Huxley and others, as our authors point out, “have driven the operation of that mystery called life or will out of the objective universe, . . . and in so doing they have most assuredly done right. The mistake made (whether by this party, or their adversaries) lies in imagining that by this process they completely get rid of a thing so driven before them, and that it disappears from the universe altogether. It does no such thing. It only disappears from that small circle of light which we may call the universe of scientific perception. But the greater the circle of light (to adopt the words of Dr. Chalmers), the greater the circumference of darkness; and the mystery which has been driven before us looms in the darkness that surrounds this circle, growing more mysterious and more tremendous as the circumference is increased.” Let that be well remembered by any who, fixing attention solely upon the conquests of science, fancy that it is occupying *all* the field because it is pushing back the boundaries of knowledge: let them remember that the rim of mystery never ceases, and that the victories of science only increase the boundary realm of mystery,

making it more and more plainly impossible that the palpable and the seen can account for all. "The Physical properties of matter," say our authors, "form the alphabet which is put into our hands by God, the study of which will, if properly conducted, enable us more perfectly to read that Great Book which we call the Universe. We have begun to recognise some of the chief letters of this alphabet, and even to put two and two together; and, like an intelligent but somewhat conceited child, we are very proud of our achievement. Like such a child we have not yet, however, completely grasped the fact that these letters are only symbols, but look upon them with intense awe as the great thing in the world, meaning, of course, our world. We look with a sort of adoration towards those pages in which there are words of two syllables, and are ready to fall down at the feet of that older and wiser child who has penetrated into the depths of such profound mysteries." Our Huxleys, our Tyndalls, our Spencers, our Cliffords, are such wise children. They have got to words of two syllables, and some of us are hastening to fall down and worship them, not remembering the mighty lesson-books that lie unopened, the grammar of the Universe that has yet to be begun, the literature of Eternity that will be studied only long after we have all passed away. Wisdom and reverence alike will be seen in keeping our minds open, in refraining from hasty conclusions, especially if these involve denials, negations, and the cry of "Impossible," in hoping all things concerning the vaster life, and in giving full play to the deep intuitions of the spirit as well as to the logical faculties of the brain. And of this be sure, that it is in itself no trivial argument in favour of the unseen universe,—that belief in it explains and ennobles the seen, and that to live for it is a consecration and an uplifting—an inspiration and a comfort—a safeguard and a guide.

23 'Lectures to Industrial Classes 1868-69. Syllabus of Fifth Course'



24 'Preface to the 4th Edition', *The Unseen Universe*—no date

P R E F A C E.

OUR readers will find near the end of our work the following paragraph, which has appeared in every edition:—'We are in hopes that when this region of thought comes to be further examined, it may lead to some common ground on which followers of science on the one hand, and of revealed religion on the other, may meet together and recognise each other's claims without any sacrifice of the spirit of independence, or any diminution of self-respect. Entertaining these views, we shall welcome with sincere pleasure any remarks or criticism on these speculations of ours, *whether by the leaders of scientific thought, or by those of religious inquiry.*'

A work like ours, containing a challenge of this sort, has naturally called forth a great amount of criticism. Bearing in mind the existence of the '*odium theologicum*,' we are bound to confess that at first we were disposed to tremble on opening any review of our work in a theological journal of repute. We were soon however delightfully perplexed at finding that the leaders of religious inquiry were disposed to treat us with the utmost courtesy, agreeing with us in very many points, and stat-

ing when necessary any difference of opinion in a manner calculated alike to preserve their independence and to conciliate our self-respect. We feel much gratified and encouraged by this treatment, and we think that if our fourth edition be compared with our first, it will be found that we possess *some* plasticity and have learned to make *some* use of the criticism so faithfully and courteously bestowed upon us.

Here we would wish to take an opportunity of stating that the Principle of Continuity as upheld by us has solely reference to the intellectual faculties. We are led, for instance, by this principle to assert that the process of production of the visible universe must have been of such a nature as to be comprehensible more or less to the higher intelligences of the universe.

But we are not led to assert the eternity of stuff or matter, for that would denote an unauthorised application to the invisible universe of the experimental law of the conservation of matter which belongs entirely to the present system of things.

Nor are we led to assert that the ether must play some important part in our future glorified bodies, for our knowledge of things is vastly too limited to enable us to come to any such conclusion.

Notwithstanding these remarks, if any theologian of repute thinks that our fourth and subsequent editions savour too much of ideas of this nature, we will gladly amend our language when a suitable opportunity occurs.

While our treatment from the true leaders of religious thought has been all that we could wish, we regret to think that some of their following have not invariably imitated the good example thus set them. All are not Bayards, whether we regard the temper of the blade or that of the individual who wields it, and amongst others the following singular method of attack has been adopted.

The propounders of certain monstrous dogmas have been by us held up to just reprobation. While regarding with utter amazement the fact that any body of men could bring themselves to profess such opinions, we have been not a little startled when the would-be Nathans proclaimed that we were the guilty Davids. Having, however, a clear conscience, and finding the assertions to which our accusers confined themselves fail altogether to enlighten our understanding, we could soon afford to regard such attempts with the maximum amount of complacency compatible with virtuous indignation.

But when these attempts were repeated after

our private remonstrance, and the whole thing crowned by a formal challenge, referring to our own published words, we were naturally driven to consult these words in order to see whether we had in reality committed ourselves to the unfruitful task of an open combat with people of this description.

We have placed the words to which reference was made at the commencement of this Preface, and we trust that a study of them will convince our readers, as it has convinced us, that we are not committed to the hopeless task of entering the lists against *this species of controversialist*. Pages of so-called 'extracts' from our book have been strung together with absolute disregard of their original collocation and surroundings, and the result is of course as utterly unfair a representation of our meaning as could possibly be given.

The 'extracts,' which are always scrupulously enclosed in inverted commas, are not merely altered in meaning by being arbitrarily detached from the context—they are often altered by the insertion of terms (*e.g. luminiferous force!*) which we, as scientific men, could not possibly have employed.

Such people ought to be reminded of the bitter rebuke administered to their analogues long ago by a witty if semi-profane divine, who

proposed to choose his text on their principle, and gave out, to the astonishment of his audience, *part* of the last clause of a verse, viz., 'Hang all the law and the prophets'!

It is with reluctance that we have felt ourselves compelled to allude to a method of controversy, as deficient in Christian courtesy as it is in its power to promote the interests of truth.

The challenge which heads this Preface does not of course oblige us to notice all the various criticisms which have been made on our work. By some writers we have been represented as holding certain monstrous doctrines, which reverence alone forbids us to mention. Indeed, there is no necessity for doing so, as such writers do not furnish us with the train of argument which to their mind associates these doctrines with our speculations.

There are, however, several points which it may here be desirable to notice, as they apparently represent a rather widespread misapprehension of our views.

One of these is, that the Principle of Continuity, as we have given it, implies the eternity of the matter or stuff which forms the visible universe. It seems almost superfluous to repeat that the Principle of Continuity has reference to the intellect, and we have used it to assert that the original production of the visible uni-

verse must have been an operation of such a nature as to render it capable of being intellectually grasped more or less perfectly by the higher inhabitants of the universe. This is all; no doubt conservation of matter or stuff is one of the laws of the present visible universe, but we have no right in our argument to carry it further.

Again, it has been alleged of us that by advocating the past eternity of THE UNIVERSE, we do not regard God the Father as the Creator. This allegation has been made in the face of our express statement to the contrary, and by a theologian who is no doubt ready to acknowledge the relation between the Father and the Divine Son, notwithstanding its past eternity. It is with regret and repugnance that we find ourselves compelled to allude to such misapprehensions.

Finally, it has been objected to us that the future state is according to us one of existence in the Ether. Our reply is that we know very little about the Ether, and are more especially in absolute ignorance of what part it may play (if any) with reference to our future state. If any of our readers from any reason feel inclined to allow no part whatever to the Ether, he is at perfect liberty to do so, so far as we are concerned.

25 'Preface to the 5th Edition', *The Unseen Universe*—April, 1876

PREFACE TO THE FIFTH EDITION.

IN consequence of misapprehensions into which several of our critics have fallen, we have prefixed to this edition an Introduction wherein the objects of our work, and the mode in which we seek to attain them, are fully but compactly explained. We need therefore say nothing on these matters here. The work has been greatly enlarged, and in many parts almost rewritten; but we have nowhere found it necessary to alter or recall any of the statements hitherto made by us.

As we now give our names, we can at length complain of the conduct of a London 'Weekly,' which, only a few days after the first appearance of our book, took the (we hope) very unusual course of stating the authorship as a matter of absolute fact, not of conjecture. It was, of course, not authorised to do so, either by ourselves or by our Publisher:—and we regret to find that the exigencies of competition for public favour can be thought capable of justifying, in the eyes of any one, such a course of conduct.

As Professors of Natural Philosophy we have one

sad remark to make. The great majority of our critics have exhibited almost absolute ignorance as to the proper use of the term *Force*, which has had one, and only one, definite scientific sense since the publication of the *Principia*. As such men are usually among the exceptionally well educated, ignorance of this important question must be all but universal. In addition to what we have said on the subject in the text (§ 97), we would now only mention that the sole recorded case of true Persistency or Indestructibility of Force which we recollect having ever met with, occurs in connection with Baron Munchausen's remarkable descent from the moon. It is, no doubt, a very striking case ; but it is apparently unique, and it was not subjected to scientific scrutiny.

B. STEWART. P. G. TAIT.

April 1876.

27 'The Late Professor Tait'

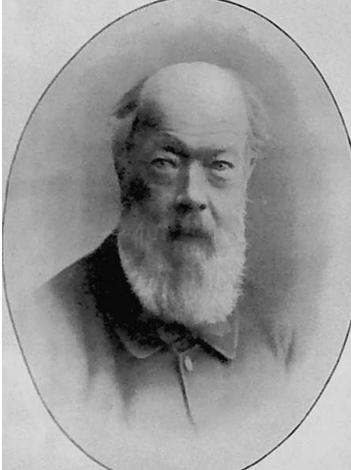
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The late Professor Tait.

AN APPRECIATION BY PROFESSOR FLINT.

SINCE we last met here the University has lost through death the teacher who had been longest in her service, and who was probably the most widely renowned member of her professorial staff. He was known to almost all of you not only by report but by personal contact and acquaintance, for almost all of you have come directly from his class-room to the class-rooms in the Divinity Hall. Undoubtedly it was a great advantage for our students here that they should have entered the Hall through that portal, and received the instruction and come under the influence of one universally recognised to



have had not only a genius of the first order for research, but rare gifts as a teacher. He was not one whom his students were likely ever to forget, while many of them must have felt that they owed to him far more than they could estimate or express.

If you have not learned to be interested in the truths of Natural Philosophy, the fault cannot have been your teacher's, and unless altogether incapable of learning anything, you at least cannot have failed to learn the very important lesson that such a man's mind was immeasurably larger than your own.

Our deceased friend was a man of strong, self-consistent individuality. He was "himself like to himself alone." And he had about him the charm inseparable from such a character. He never lost the freshness of spirit which so soon disappears in the majority of men that it is apt to be deemed distinctive of youth. There was to the last a delightful boyishness of heart in him such as is assuredly a precious thing to possess. I am quite aware that great as he was, he had his own limitations, and sometimes looked at things and persons from one-sided and exaggerated points of view, but the

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consequent aberrations of judgment were of a kind which did no one much harm and only made himself the more interesting. His strong likes and dislikes, although generally in essentials just, were apt to be too strong. Although, and professed the most supreme contempt for all that he called metaphysics. In connection with that I may mention an incident which once afforded much amusement to academic men in St Andrews, but is probably now forgotten even there. Shortly after Tait had delivered the remarkable lectures to which we owe the work entitled "Recent Researches in Physical Science," he dined one evening at the house of the Professor of Mathematics in St Andrews, and among other guests present was a Glasgow Professor of Theology who had even less esteem for physical science than our dear departed friend had for metaphysics. Tait was very naturally drawn out to talk about the subjects which he had been lecturing on, and he did so largely and to the delight and edification of every one except the worthy and venerable Glasgow Professor, who, when he could stand it no longer, gravely put the question—"But, Mr Tait, do you really mean to say that there is much value in such inquiries as you have been speaking about?" After that the subject was changed, and during the rest of the evening the great physicist and great metaphysicist did little else than, as Tulloch expressed it, "glour at each other."

Tait was a genius, but a genius whose life was ruled by a sense of duty, and which was shown to be so by the vast amount of work which he accomplished, and which is acknowledged by those who are able to judge of its worth, to be of the highest value. He was a genius with an immense capability of doing most difficult work, and he faithfully did it. His life was one of almost continuous labour. He faithfully obeyed the injunction, "Work while it is called to-day." And the work which he chose to do was always hard work, work which few could do, work which demands no scattering of one's energies, but the utmost concentration of them. He wasted no portion of his time in trying to keep himself *en evidence* before the world. He willingly left to others whatever he thought others could do as well or better than himself. But whatever he thought it his duty to undertake he did thoroughly. Thus for the last twenty years at least he was the leading spirit in an institution more closely connected, perhaps, than any other with the University of Edinburgh. I mean the Royal Society of Edinburgh.

It is natural for those of us who painfully feel that we shall not see his like again, natural for those who are most deeply deploring his loss, to wish that a longer life had been granted to him. Yet they may well doubt if he himself would have desired a mere prolongation of life. I cannot but think that he would not have cared for a life in which he could not labour.

While his friends must sorrow for his loss, they are bound also to acknowledge that God had been very good and gracious to him. He was favoured with many years of health and strength in which to work. His abilities were so conspicuous even in youth that they could not be hid. He could hardly have been earlier placed than he was in the very positions most favourable to the exercise of the gifts which had been bestowed on him. He was a Professor for forty-seven years, a Professor in Edinburgh for forty-one years. He was beloved by his students. His colleagues were proud of him. His

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country knew his worth. His many contributions are to be published in suitable form at the cost of his English Alma Mater. He is among the few in a generation of whom the memories live through the centuries. As thereto that his own worth and the value of his work were by none more fully appreciated than by those who were nearest and dearest to him, and that distracting cares were spared him, and he was wisely left to follow the be of his own genius. He had, so far as I know, only few great afflictions. The greatest, which fell alike on him and his family, was the loss of the generous gallant, brilliant youth, who met a soldier's death near the Modder River, and in that loss a nation sympathised with him.

Our departed friend had no sympathy with theological dogmatism, and little with anti-religious scepticism, and consequently held in contempt discussions on the so-called incompatibility of religion and science. At the same time, he had a steady yet thoughtful faith in God, and in that universe which no mere eye of sense, aided by any material instrument, can see. The faith must have made his life richer, stronger, and happier than it would otherwise have been. And it must be a comfort to those who have the same faith and to those who most deeply mourn his loss, to believe that he has entered into that universe which is so much vaster, and which may well have far greater possibilities of progress in truth and goodness in it than there are in the "seen" universe of us—the passing creatures of a day. The things that are seen are temporal. The things that are unseen are eternal.