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ORDINARY MEETING, MAY 15, 1882.

REV. R. THORNTON, D.D., V.P., IN THE CHAIR.

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

MEMBER :—Rev. C. H. Sutton, M.A., London.

HON. LOCAL SEC. :—Rev. S. D. Peet, United States.

Also the presentation of the following works for the library :—

"The Christian Philosophy Review."	*From the Institute.*
"Christian Positivism." Rev. G. Blencowe.	*Ditto.*

The following paper was then read by the Author :—

DICTATORIAL SCIENTIFIC UTTERANCES AND THE DECLINE OF MODERN THOUGHT. By LIONEL S. BEALE, F.R.S.

THE inquiry whether the hypotheses upon which modern scientific opinion in favour of some form of the physical doctrine of life which constitute the basis of every kind of materialism are or are not worthy of acceptance at this time, has called forth very different replies. Some in authority have answered with a positive and unhesitating affirmative, others have given an uncertain assent, or have contented themselves by not dissenting. A very small number have objected to the physical view of life as untenable in the present state of scientific knowledge, and as being, upon various grounds, unworthy of acceptance. In this minority I still find myself, because, notwithstanding full inquiry, and very careful examination

concerning conclusions arrived at by others, I am obliged to confess that I feel more strongly convinced than ever, that all the physical doctrines of life yet advanced are quite untenable. Some of the reasons which have led me to draw this conclusion shall be set forth in this paper, while many more have been already given in works and memoirs which have been written by me during the last twenty years. The general conclusion which, as it seems to me, a careful and candid examination of the facts which bear upon the question compels an unbiassed thinker to draw, is that no form of the hypothesis which attributes the phenomena of the living world to mere matter and its properties has been, or can be, justified by reason.

Unlearned people have been flattered by having been, as it were, taken into the confidence of certain authorities of materialistic tendencies, and assured that, as science is but educated common-sense, they are well able to judge concerning many deep scientific questions of consummate interest to every person of intelligence, and that, therefore, they will feel convinced of the truth of recent conjectures on the physical nature of life. Materialistic doctrines have now been taught for so many years that they have come to be looked upon as a sort of belief, or faith, which ought to be at once accepted by all who desire to be considered, from the materialistic point of view as reasonable persons. Any who should be so rash as to inquire concerning the exact meaning of the terms employed would be, of course, altogether beneath notice, as they would prove, by the doubt they implied, that they belonged to that large group of unteachable persons not included among the wise, the learned, or the cultured.

Instead of the hypothetical suggestions in favour of the physical doctrine of life, advocated by materialists and others, resulting from a legitimate flight, or extension, of the imagination into the border-land which lies between the extreme limit of observation and experiment, and that region which gradually passes into the Unknown and Unknowable, it will, I think, be found that they are almost entirely sustained by mere assertion, and by authoritative declaration, while careful study will convince that they are not sanctioned by the facts, observations, and reasonings, which constitute the science and philosophy of the time in which we live.

Positive conclusions have been drawn concerning questions of momentous consequence not only to curious and scientific people, but to mankind at large, and have been advocated with a confidence which precludes doubt, and reiterated with a pertinacity, which is calculated almost to enforce acceptance.

But few of those, who are carried along by the materialistic stream, have troubled to think over the remarkable tenets to which they have given their assent. They receive with a faith, called robust, which seems so blind and unreasoning as to border on credulity, dogmatic and dictatorial conjectures of the most extravagant kind, convinced, but not by reason, that the authors of them could not be mistaken in the views they advanced with such positive and undoubting emphasis.

The reception of materialistic dogmas by any intelligent person who takes the trouble to think over their terms, and is capable of appreciating, and analysing, and examining the evidence upon which they are supposed to rest, is simply impossible; and the applause with which these views have been received in some quarters is to be accounted for by the decline of thought, and the indisposition on the part of the public to trouble to think at all on the merits of the arguments presented to them. Is there one acquainted with the powers and actions, and results of living, of any form of living matter, who will declare that he believes the doctrine that non-living matter alone is the source of all life, and will state the grounds of his belief?

Bear in mind that no state of matter known, no mere chemical combinations, no mechanical contrivances, no machinery ever made, can be caused to exhibit phenomena resembling in any really essential particular those which are characteristic of every form of living matter that exists in nature, and which, we must infer, have characterised every particle that has ever existed since the first appearance of primitive life on the earth.

Neither can any known form or mode of ordinary energy construct or form, direct, control, or regulate. Nevertheless, it is taught far and wide that vital actions are due to the energy which belongs to ordinary matter, and that, therefore, vital action is but a modified form of ordinary physical or physico-chemical action. Vital action, it is said, differs in degree only from actions which occur in the non-living world.

As regards the nature of that remarkable process of growth which takes place in all things living we find great diversity of opinion. Some, indeed, maintain that growth is not a vital process at all, but that it essentially consists of the aggregation of particles of matter; nevertheless, no one who regards growth as a physical operation has appealed to any definite case of growth to show that the intimate changes which occur are really of the character he asserts. The growth of a leaf, for example, seems to be very widely removed from the mere aggregation of particles of matter.

In all growth we have a process essential and peculiar to all life, which is confined exclusively to the living, which does not characterise any form of non-living matter whatever. But *growth* is but one of several vital phenomena absent in all non-living, present in every kind of living. It has been asserted, and is now ordinarily taught, that crystals *grow*. Between the so-called growth of a crystal and the actual growth of a particle of living matter there is, however, no true analogy.

Herbert Spencer, strange as it may seem, affirms that crystals *grow*, and that non-crystalline masses of various kinds *grow*. He declares that the accumulation of carbon on the wick of an unsnuffed candle is an example of *growth*. On the other hand, he states that the living shoots from a growing potato are not an example of growth. Now I desire to direct your attention to this part of Herbert Spencer's work because he endeavours to convince his readers of "the essential community of nature between organic growth and inorganic growth." There, will be found some of the very remarkable inferences upon which his system of evolution in part rests, and which may be clearly proved to be erroneous. Indeed, not a few of the assertions he makes may be answered by a direct contradiction, with advantage to the cause of truth. Non-living things do not *grow*, as he affirms, while all living things and every form of living material *does grow*, although, he says, with respect to a living plant, that its increase is not *growth*. The case of the potato, which he affirms not to be *growth*, is really as good an instance of growth as can be obtained in nature. Now, if I can persuade any disciple of Herbert Spencer to explain and defend his utterances in the first two pages of this chapter of part ii. on the "Inductions of Biology," I think much advantage would result. A careful examination of this chapter will enable any intelligent person to see how the idea of community of nature sought to be established between the living and the non-living is defended by this author. The so-called *growth* of the non-living masses differs absolutely from the only true *growth* which is peculiar to the living world, but universal in it. Now vital growth has never been explained to this day, and cannot be explained on chemical or mechanical principles, or imitated in the laboratory. The *growth* of the most minute particle of living matter is, as I have stated, a vital process, and is due to the operation of a force or power absolutely distinct from ordinary energy and from every form of force of non-living matter. Every kind of aggregation is absolutely distinct from growth, and does not involve the

latter. Processes of aggregation may go on to all eternity without the occurrence of any change resembling, or allied to, that of growth. *Growth*, after all, is but one of several purely vital phenomena.

Surely it is the duty of all persons having any pretensions to culture, who esteem accuracy and truth, and desire to promote their diffusion, either to condemn the materialistic doctrine as scientifically untenable, or to insist that more accurate and adequate explanation of the facts and principles upon which it is based should be given by those who have unreservedly committed themselves to the universal application of this physical hypothesis of life, and that some reply should be made to the objections that have been raised to its general application to living things.

I would draw attention to the declaration again and again repeated, and now taught even to children, *that the living and the non-living differ only in degree, that the living has been evolved by degrees from the non-living*, and that the latter passes by gradations towards the former state. No one has adduced any evidence in proof of these conclusions, which are, in fact, dictatorial assertions only, and no specimen of any kind of matter which is actually passing from the non-living to the living state, or which can be shown to establish any connexion between these absolutely different conditions of matter, has been, or can be at this time, brought forward.

You will, I think, find that, in endeavouring to prove the reasonableness and strength of the doctrines they have espoused, the advocates of every form of materialism mainly rely upon the assumed applicability to matter that lives, of conclusions arrived at concerning the nature of the phenomena of non-living matter. But the fact, That this living matter, as is well known, is invariably derived from matter that already lived, is a serious difficulty which presents itself to the mind at the outset of the inquiry, and which, instead of receiving some explanation as regards its bearing upon physical views of life, is on account of its inconvenient tendency generally ignored. Materialism, indeed, rests upon this assumed intimate alliance and relationship between the living and non-living. But as soon as the knowledge of the peculiar and special nature of all vital actions shall be better known and more widely spread, and when people shall have learnt how absolutely the vital are marked off from purely physical and chemical actions, belief in materialism will be shaken, and this antiquated creed will then only retain the support of a few faithful adherents wedded to the old paths and ancient ways who have not heart to desert the old beliefs, evolved in the infancy of thought and

philosophical inquiry. Were their reason allowed to do so, it would probably lead them towards a goal of a very different nature. It is, indeed, strange that one of the chief means relied upon for the purpose of convincing people of the truth of materialism should be to institute comparisons between things which are alive and have gradually grown—from the infinitesimal, transparent, structureless—into form and bulk, and lifeless machines which have been made in pieces and afterwards put together; and to assure the public that these two utterly distinct things, living beings and machines—nay, machines made by man, and not capable of being produced in any other way—were very much alike, and belonged to the same category. It would be tedious were I to repeat the dictatorial utterances in argumentative form which have been published far and wide for the purpose of leading people to believe that a living thing was like a watch, or a steam-engine, or a hydraulic apparatus. Moreover, some of the comparisons have been voluntarily abandoned by their authors in favour of others even more absurd. Such tricks as calling a watch a *creature*, and a man a *machine*, are hardly likely to mislead even the most ignorant after they have withdrawn themselves from the bewitching influence of the persuasive eloquence of the materialist prophet, and have commenced to calmly think over his extraordinary utterances, in order to extract any meaning that may be hidden by the frothy metaphors of modern physico-vital conjecture.

The very last comparison made for the purpose of helping people to understand the nature of a living thing is, I think you will say, the very worst and most inappropriate ever suggested—one that, as you will perceive, must be rejected, not only because it is quite inapplicable, but because the thing with which a living being is compared is so distorted and so changed that it is no longer what it has been called—nay, in the terms adopted it is not even conceivable by the imagination. This last thing which it has been said a living body is like is called an army, but, as I shall show you, some essential characteristics of an army have been taken away, and some impossible characteristics arbitrarily added, which would reduce a hypothetical army to that which could no longer be correctly termed an army; and as some of the characters superadded are absolute impossibilities of nature, the whole comparison comes to little more than incongruous, unintelligible metaphor, or incoherent rhapsody, which may amuse the fanciful and thoughtless, but which ought to be condemned, by all capable of thinking, as extravagant and misleading, and as likely to hasten the decadence of thought.

Let me beg of you not to allow the mind to be diverted by fanciful comparisons and asserted resemblances of the living to the non-living, from the careful consideration of the real differences between that which is alive and that which is not alive. This question of difference or resemblance between vital and physical will be found to underlie some of the most important speculations of our time, and I cannot too earnestly draw your attention to the very great importance of insisting that the facts and arguments advanced by materialists should be clearly stated so that they may be thoroughly sifted, and fairly discussed, instead of vague assertions in favour of wide generalisations being accepted without examination or inquiry. If examined, not a few of the conclusions will, I am sure, be dissipated at once, for they will not stand the test of careful analytical exposition.

It is not to the credit of the science, or the philosophy, or even the common-sense of our day, that broad and far-reaching doctrines of the kind alluded to, and which involve inferences of transcendent consequence concerning the present, past, and future of all things, should be accepted without examination, taught far and wide even to babes, and presented in a clever and inviting guise, and made to appear as if they were actual and generally received truths, to be accepted by all who wish to be considered to be progressing with the times, while in reality the doctrines in question are mere conjectural opinions founded on vague and insufficient data, with nothing whatever to recommend them save authoritative assertion. Such doctrines would have little chance, were it not for love of extravagant novelty and the decline of thought.

It must, I think, be admitted that in science, as well as in some other departments of human endeavour, there is at this time far less freedom of thought as well as of discussion than is necessary for intellectual progress. Real advance is in these days too often thwarted by cliques and caucuses whose chief business it seems to be to manufacture "public opinion," to create "tendencies of thought," and thus prevent, or render nugatory, the intelligent examination and criticism of the doctrines established and spread. Besides this, the prejudices of the unlearned are sometimes flattered, and the applause and indolent acquiescence of mere numbers eagerly sought for. Many of those who support materialistic doctrines, are too lazy to think over the principles upon which the doctrines they are persuaded to accept are based, nor are they able to estimate the consequences which the general adoption of such speculations would involve. The exercise of a sort of terrorism has led to people being frightened into a sort of confession

of faith in some absurd dogmas, the threatened penalty for refusal being that of being numbered amongst the fools, the bigots, the orthodox, and the like.

Some who accept fancies of the most conjectural character as new articles of belief, which involve the abandonment of old truths as well as the sacrifice of firm bulwarks of belief, seem to reluctantly yield a regretful but conscientious submission to the stern dictates of truth, and pose as if they were exercising a self-denying virtue, possibly not unalloyed with pity, nor quite free from contempt for those who still hopefully cling to the beliefs of their fathers. Nevertheless, if you will take the trouble to thoroughly investigate the principles of the new faith, you will be convinced that all that can be obtained by the most careful analytical examination of the foundations upon which different forms of new materialism rest, are dogmas about forces and properties, hypotheses as to what may be, or might be, or must be, and a robust faith, which you are requested to have, in wonderful discoveries which are to be made after the lapse of some time by privileged spirits who, it is asserted, will make their appearance in the future.

That a materialistic and antitheistic view of things may present itself to some minds, and assume what seems to be a reasonable form is, however, possible; but the pretentious vapourings in philosophical phraseology familiar to us, and which are supposed to tend towards that by not a few much-to-be-desired consummation, are often but a poor parody on materialism, and a real disgrace to the critical and reasoning power of our time. Some of the assertions which have been made about the properties and potencies of matter, and which are repeated even in text-books, would not survive candid answers to the questionings of a curious schoolboy.

The popular scientific doctrines of the last few years all seem to admit some vague, imaginary, non-existing first cause, of which neither the nature nor the attributes have been defined, and which is placed at such a remote distance in time from the present era, that in us it can hardly excite more interest than the possibility of a shadowy phantom in an all-pervading primitive mist. There seems to be a fanciful conception of material atoms being evolved from the void; but it is, of course, useless to ask why, when, or how? By one supreme mysterious fiat, or effort, beyond, above, and independent of all law, eternal forces and properties were conferred upon these atoms, I suppose, at the moment of their evolution from the nothing, by virtue of which they restlessly gyrate. The vibrations communicated to atoms by the first impulse then

came under law, and in obedience to laws supposed to have been enacted in the first beginning, still continue their movements, and being acted upon by, and acting upon other atoms, actions of the most complex character are established. Gradually these actions are supposed to take the form of life, and as the ages have rolled on, living forms have assumed a higher character until, at last, the evolution of man himself was consummated. Of all things the farthest removed from the remote cause of his existence, man, the only being in nature longing to know of law, of cause, of consequence, is commanded to see grandeur, and more than grandeur in the fanciful suggestion of a creator of molecules of cosmic vapour out of which earth and air and water, and every form of matter, non-living and living, were, according to the hypothesis, gradually formed, or evolved themselves in obedience to some compulsory arrangement, or not to be accurately defined necessity, or "law," supposed to have been enacted for once and for all by the Creator in the first beginning, and still causing everything and operating on everything up to this very day.

The materialist needlessly, and without reason—or, rather, against reason, as it appears to many—sneers at the want of enlightenment of past generations, and in his own dogmatic, and self-confident, infallible way expounds the materialistic views of the existing order of things; extols the tendencies of what he calls the thought of his time, by which he seems to mean materialistic dogma, and prophecies concerning the proofs of the truth of his teachings which are to be discovered by unborn materialistic investigators. His hearers listen with wrapt and unquestioning reverence to his vague and extravagant utterances. They cannot doubt; they dare not think. Have not gifted mechanisms of the highest culture spoken? have not privileged spirits of transcendent power prophesied? Who, then, fit to survive, can doubt—who dares to disparage the glorious grandeur of the universal, ever-moving molecular mechanism?

How often are we enjoined with austere solemnity not to resist the influence of the cold logic of materialistic science? We shall be spurned by many, but we must be encouraged by the conviction that we are acquiring material truth, and sustained by the consolation that, though we may be looked down upon, we may feel certain that we alone are right. We are not only told how we must look at nature, but precisely what we are to see is most accurately described, exactly as it has been discerned by the materialistic intellect and caused to assume a form fit to be received by the people at large. The moving forces and molecular mechanisms have been revealed.

Nature herself has been discovered. And a very pretty nature, indeed, is the materialistic nature which has been embodied by authority, and held up for the contemplation and admiration of mankind. Instead of the benign nature of the Epicurean, which gave to all, which made all, and which provided for all, we have a benighted nature in the shape of a blind, insatiable, relentless, irresistible fate, falsely called law—working like a dull, senseless machine of overwhelming might, maiming, crushing, distorting, destroying, and thus continuing and preserving,—destitute of intelligence and reason,—devoid of justice and mercy. A nature not contributing to the happiness or enjoyment of any, working upon a world peopled with machines and continued by the destruction of the products of ever-recurring, ever-failing, unintelligent, undesigned experiment. A nature whose law is in part worked out by length and strength of tooth and claw. A nature which must be detested by the good, and despised by all who can think, and see, and reason. Such is the natural world which is held up for our admiration with the consoling assurance of dictatorial authority that it sprang from chaos in obedience to everlasting self-originating (?) law, and that it will return to chaos, in obedience to the same,—all life and work and thought being but the undulations of cosmic nebulosity, and dependent upon the never-ceasing gyrations of infinite, everlasting atoms, as they bound through the ages from void to void.

This, the dullest, the narrowest, the most superficial of all creeds—materialism, which includes some mixture of antitheism and atheism of various forms and hues—has been half accepted by hundreds of persons during the last few years. I believe all materialistic doctrines, vary as they may in detail, will be found to agree in accepting as a truth—if, indeed, they are not actually based on it—the monstrous assumption that the living and the non-living are one, and that every living thing is just as much a machine as a watch, or a windmill, or a hydraulic apparatus.

According to the material contention, everything owes its existence to the properties of the material particles out of which it is constructed. But is it not strange that it never seems to have occurred to the materialistic devotee that neither the watch, nor the steam-engine, nor the windmill, nor the hydraulic apparatus, nor any other machine known to, or made by, any individual in this world, is dependent for its construction upon the properties of the material particles of the matter out of which its several parts have been constructed? Who would think of asserting that in the properties of brass and

iron or steel we shall find the explanation of the construction of a watch? It has been often affirmed in positive and dictatorial language that the formation of the animal is due to the properties of the particles of which its body is composed.

There can be no doubt that of late years there has been an intense desire on the part of many people to be assured that there was no absolute or essential difference between the changes taking place in living things and in non-living matter, and this idea is supposed to add grandeur to the conception of the unity of universality. The desire has been abundantly gratified. The assertion has been made again and again, and it is being continually repeated and emphasised, but, strange to say, some incredulous sceptics doubt whether, after all, the assertion is literally true. They listen, they admire, they repeat; they even try to persuade themselves and others that the assertion is true, but still they doubt. Many, though they are assured of the analogy between hammered iron giving out heat and the brain, sensation, are not quite convinced. The too frequent repetition of a scientific statement seems to beget doubt in sceptical minds concerning its accuracy. If, as it should do, the doubt excites a determination to carefully examine the foundation upon which the doctrine of the identity of physical and vital phenomena rests, the conviction of the utterly untenable character of the hypothesis will be forced upon the mind of the inquirer, who will afterwards be on the side of the opponents of the faith in the unity of non-living and living.

Many persons of intelligence cannot but admire materialistic unity, and are anxious to be convinced that the non-living and living are really one, and that the phenomena of the living world are due to the properties of matter as much as are those of the non-living world. The simplicity of the idea is convincing. Persons of this persuasion do, in fact, accept materialism in faith, but, above all things, they desire that their doubting faith should be fortified by robust reason. The desire has not been gratified, and, in fact, not a few are troubled by doubt. Those who think over the matter do not wholly believe, though they wish they could believe that they are mere machines. They cannot call to mind any machine which grows as they have grown, while all the machines they know anything about have been made in pieces, which have been put together afterwards.

When people begin to think, they will soon see how absurd it is to maintain that growth and the actions going on in living beings are due to the properties of the particles of matter of which their bodies are composed. A little reflection will make

it obvious enough that neither the formation nor the action of the watch, or the steam-engine, or the windmill can be due to the properties of the matter of which the machine is made, but that formation and action depend upon the manner in which the parts are fashioned and put together and made to work. And, of course, the suggestion will occur to those who think that, if all these machines were to be destroyed and pounded to pieces, the matter would still retain its material properties, although no one could then discover that it had ever taken the form of a watch, or an engine, or a windmill, any more than a chemist from a thorough examination of the mere matter and its properties would be able to premise that it would one day take the windmill, watch, or other form. But, however severely faith in materialism may be shaken by thought, its admirers may take comfort in the consideration that, although to their uninformed intellects much may seem doubtful, uncertain, and strange, the high priests of materialism could unquestionably explain all, and make everything clear, if they deemed it desirable and to the advantage of the millions to do so at this time. The final and complete materialistic revelation is to come in good time.

"Protoplasm" and "Physical basis of Life" have entered into many dictational utterances, and the words must by this time be familiar to every one. But if we endeavour to ascertain the exact meaning which is attached to the words, and try to make an accurate estimate of their value with regard to the new light supposed to have been thrown by their use upon the question of the nature of life and the relation of non-living to living matter, we shall find that our task is not an easy one. Protoplasm, it is said, is the physical basis of life. The moving matter in the hair of a nettle, or in a cell of vallisneria, the moving matter of the body of an Amæba or a white-blood corpuscle, white of egg, boiled white of egg, muscle, roasted and boiled muscle, boiled lobster, are, it has been said, composed of protoplasm and constitute the physical basis of life. Upon the molecular changes taking place in these different forms of matter, life, it has been affirmed, depends, and all of them, it is said, are composed of "molecular mechanisms."

No one can attentively study the statements, and apply his mind to the examination of the assertions which have been made, without observing that the same name, protoplasm, is applied to matter in essentially different states. Living matter is called protoplasm; dead and boiled and roasted matter is also called protoplasm. Living matter, dead matter, and roasted matter are all the physical basis of life. That which is not only dead, but has been dead for a long time, is the

basis of *life*. The matter of a living thing which is alive at the time is also a "*physical basis*." That which is alive is a physical basis of life, and that which is dead is equally a physical basis of life. Such is the reply made to the question, What is the difference between living matter and the same matter which has ceased to live? Such is the method by which it is shown that the difference between the living and the non-living is not a difference in kind, but in degree only. Such is the method by which people have been misled and confused. It is, of course, mere idle trifling of the most transparent character. But few persons have taken the trouble to carefully examine the statements with the object of discovering exactly what was the meaning the author intended to convey. Many, perhaps the majority of readers, are content to catch the words, without troubling themselves to ascertain what meaning ought properly to be attached to them. Perhaps they feel much confused, and, not liking even to think disrespectfully of the writer, they persuade themselves that the full consideration of the question is beyond the province as well as the capacity of busy people engaged in the ordinary work of life, and that, therefore, they must accept without inquiry the assertions, as the authoritative utterances of gifted spirits.

Such views would have little chance of being received, or even tolerated, had they not been advanced at a time which was remarkable for the decline of thought, and for the dislike or fear of examining and analysing authoritative statements.

The phrase "undifferentiated protoplasm," as contrasted with "differentiated protoplasm," is now often used. Children are asked questions about it in elementary examinations, and yet no exact meaning has been given by any one to the terms, and the sense in which the words are often used is incorrect. The "differentiation" of protoplasm is one of the cant terms of the time, and is supposed to explain a great deal, while it only deceives and confuses; for instead of differentiation being an explanation of change, or the cause of change, as is implied, it is really only a way of stating a fact. If it is correct to call the undifferentiated matter protoplasm, it cannot be correct to call the differentiated matter by the same name, because the first exhibits phenomena absolutely distinct from any manifested by the last.

Let us endeavour to keep clearly before our minds the paramount importance of the answer given by the science of our time to the question, "What is the difference between living matter and the same matter in the dead state?" If it can

be proved, as declared in many scientific dictatorial utterances, that the difference is molecular, mechanical, or chemical in its nature, then must things living be included in the same category as non-living matter. The living and non-living in that case will truly be one; then would be established the much longed-for Unity; then would materialism rest on an intelligible basis, and constitute the foundation of a popular if not a progressive creed.

But the science of our day has given no answer of the kind. On the contrary, all investigations so far carried out lead to inferences of an opposite tendency. So far from the gradations asserted to exist having been proved, not a vestige of anything tending towards proof has been discovered. No difference in kind so consummate, no divergence in property so wide or so absolute, can be pointed out in nature, as the difference which subsists between a minute particle of matter in the living and the same in the dead state. The difference remains to this day as irreconcilable, inestimable, absolute, in every sense as it ever was; while there is no reason to suppose the difference will be less in time to come.

Now, let me ask you to consider for a moment the movements which affect every form of living matter while it is alive, which cease with its death never to recur, and which are absolutely different from any movements of non-living matter which are known. In many instances so active are these movements that they can be seen and studied under the microscope by any one who chooses to take a little trouble. Although the observer may not be a trained microscopist, he will see enough to satisfy him that the movements are not like those of any ordinary matter. It is true that movement occurs in all kinds of matter non-living as well as living, but the movements of the molecules of non-living matter are one thing, those of living matter another thing altogether. The former belong to matter as matter, and occur in the particles whether alive or dead. The latter continue only as long as life lasts. It has been authoritatively declared that living movements differ from non-living movements in degree only, and not in kind. But any one who studies the movements of living matter soon becomes convinced that they are different in kind from any non-living movements, inasmuch as they begin and cease under circumstances which would not affect the movements of non-living matter, while the very matter which exhibits the living movements will exhibit non-living movements after it has ceased to live. The materialistic doctrine of life, instead of resting upon facts of observation and experiment, rests upon assumptions of the most extravagant

kind, and the facts of nature are too often distorted and made to bend to the requirements of artificial and ridiculous creeds resting on authority only.

Thoughtful persons must be surprised that the constant repetition, without any attempt at proof, of such assertions as, that all living things are mechanisms, mere machines, and that in the living matter of their bodies there is molecular machinery—does not of itself lead to the exposure of the extreme weakness of the materialistic view. For is it reasonable to suppose that the ardent advocates of materialistic doctrine would be content with vain repetitions if they could explain and illustrate their assertions so as to make them intelligible? Would they not offer remarks concerning the *sort* of machinery they say exists? Would they not tell us how it appeared, something about its structure, the way in which it was put together, the mode in which it was dissolved and renovated, the means by which it was made to act? Would they not have something to suggest concerning the forces or powers by which the working of the machinery was directed, and the probable source of these, as well as their ultimate fate? Would they not, if they could have done so, have given diagrams of the molecular machinery of their imagination for the instruction and edification of their less learned and weaker brethren? But, instead of this, all that men of this persuasion seem able to do is to repeat again and again the same monstrous assertions, That living matter and non-living matter differ only in degree, and that the action of living matter is due to molecular machinery. But, besides giving to non-living matter molecular machinery, the capacities and powers which the living alone possesses are sometimes given to the molecules of inorganic matter. Professor Huxley, for example, goes so far as to affirm that these inorganic molecules have the power of "sensitively adjusting themselves." Indeed, one would not be surprised if it were discovered that certain molecules which had acquired advantages over others arranged themselves in such positions as would enable them most successfully to jostle weaker molecules and take the places they were the fittest to occupy.

That such vague notions should be accepted by any but a few enthusiasts who knew nothing of the facts would be surprising; but that such very imperfectly considered conclusions should be accepted by many and become really popular, indicates that there is somehow a demand for them—a desire or determination on the part of people to receive them—a longing to believe them, and a conviction that they will be proved to be true—a determination to rely upon mere authoritative

declarations, and to have their thinking done for them instead of thinking for themselves. Such are some of the indications of a decline of thought.

The public are nowadays assured that the phenomena of the living world are due, not to *life*, but to the molecular constitution of the matter of which the bodies of living things are composed. Ere long, however, people will find that little consolation, or information, is to be gained from the molecular constitutions that may be, and then they will perhaps be content to be brought face to face with the facts as they are, and will see that the conclusion, That matter became endowed with vital power *after, and perhaps very, very long after it had acquired its molecular constitution*, is more in accordance with the facts of nature than the assumption, That all living forms are due to non-living properties, and that no powers whatever have been communicated to matter and no direct metabolic influence exerted, since its first creation.

It is not now easy to get a hearing for arguments in favour of views concerning the nature and action of living things which in any way conflict with what happens to be the current opinion of the time. The educated public has much to answer for as regards the unmeasured support it has for years past given to speculative thought of a most one-sided character, as well as for the tyranny it has permitted and encouraged, and still allows to be exercised towards any who put forward conclusions which happen to be opposed to the fashionable dogmas of the day.

Can applause or great popularity afford any excuse for the unfair way in which many popular authorities have put the question of vital actions in living things before their hearers? The alternative view is almost invariably represented as an absurdity, or a perverse misrepresentation of the facts. The extent to which mere intellectual trickery is carried in these days is marvellous; but so few people think over what is affirmed by teachers very popular at the time, that the most astounding absurdities receive a sort of acquiescence, and long escape the exposure they deserve. Those who differ from materialists are credited with believing in all sorts of nonsense, and are said to stand upon the ancient ways, while, in point of fact, these professors of materialism—in their style, in their method of procedure, in what they teach as new—are truly most antiquated, for they are really trying to make the world go back more than two thousand years, in order that it may gain the inestimable advantage of reverting to a faith compared with which Mahometanism is advanced, indeed.

In his address to the Medical Congress, Professor Huxley

tells the assembled medical and scientific men that "the simplest particle of that which men in their blindness are pleased to call 'brute matter,' is a vast aggregate of *molecular mechanisms performing complicated movements of immense rapidity and sensitivity* (!) *adjusting themselves* to every change in the surrounding world. Living matter differs from other matter in degree and not in kind; the microcosm repeats the macrocosm, and one chain of causation connects the nebulous original of suns and planetary systems with the protoplasmic foundation of life and organisation."

Professor Huxley has been continually propounding and putting forward conjectural utterances of the kind during the last twenty years, and it is surely now time that something more substantial should be brought forward in support of the dogmas than conjectural chains of causation. Just think over the paragraph I have read, and try to extract from it any sense it may contain. We are told that "the protoplasmic foundation of life and organisation" is connected with "the nebulous original of suns and planetary systems," by "one chain of causation." Can an individual be found who will undertake to defend or to expound these nebulous utterances? If they amuse, they will certainly delude and mislead an audience. Here is an example of what is considered good for the purpose of advancing scientific education. That talk of this kind should be deemed likely to enlighten the medical profession, or assist in any way to advance medical education, is most extraordinary.

It is not pleasant to have to differ from Professor Huxley, for not only has he a multitude of enthusiastic admirers, but he is himself a master in the use of very robust language, particularly when he deigns to refer to people who do not agree with him. Some who are unable to accept as the exact truth what he affirms to be truth have been spoken of as bigots, and it is possible that some other epithets may yet be found to still more decidedly characterise people who are opposed to his doctrines. Only the other day it was said that a truth which, according to Mr. Huxley, had been "trodden under foot, reviled by bigots, and ridiculed by all the world," is "only hated and feared (!) by those who would revile but dare not!" Professor Huxley likes the word "revile." To say that people who differ from you revile you is, undoubtedly, an ingenious way of getting out of a great difficulty. When you are asked to explain what you mean by some very confident dictatorial utterance, and if you feel that you cannot do so, there is nothing like accusing your opponent of reviling.

Any evolutionist who has a question put to him which it is inconvenient to answer, and which it would be imprudent on his part to discuss, is "reviled." But, whatever the consequences, I shall venture to make some remarks on a few of Professor Huxley's recent utterances, even at the risk of being also condemned as a reviler.

What do you think of the attempt to convince people of the similarity or identity or close relationship between non-living matter and living matter, by calling a non-living particle and a living particle a "molecular mechanism," and by further asserting that non-living matter can be resolved into "molecular mechanisms," and that living matter will also be resolved into "molecular mechanisms?" Huxley tells the Medical Congress that matter is an aggregate of "*molecular mechanisms* performing complicated movements of immense rapidity, and *sensitively adjusting themselves* (!) to every change in the surrounding world." But fancy giving to a particle of lead or iron this power of "*sensitively adjusting itself.*" Is there any one in the world, besides Professor Huxley, who would apply such language to non-living matter? By giving to the non-living the attributes peculiar to the living, Professor Huxley succeeds, according to his own satisfaction, in breaking down the contrast between living and non-living matter; but will any one else believe that anything of the kind has been done?

Is it not almost a disgrace to the thought of our time that such transparent fallacies and absurd misrepresentations should not only be allowed to pass without comment, but receive the sanction and approval of many scientific men? Again, Professor Huxley tells the Medical Congress that vital actions are "*nothing but* changes of place of particles of matter." What vital action in this world is *nothing but* a change of place in particles of matter? The statement seems not only unsound, but unfair. To say that any vital action *is nothing but* a change of place of material particles is surely absolutely incorrect, for not only are all vital actions much more than this, but physical actions are more. It is obviously the something more than mere change of place that makes the difference between one form or kind of action and another. If there was *nothing but* change of place, it is clear there would be but one action in the universe, instead of infinite variety of action.

Qualities and properties are by materialistic authorities attributed to matter or denied to matter, as may be convenient; but any attempt to explain the difference between a particle of living matter and the same matter when it has ceased to live, is carefully avoided. It is suggested that the

only difference is a difference in the rate or degree of activity of the molecular mechanisms of which matter dead and matter roasted and boiled, living, not living, of every kind and form, and in every state, is composed. The matter which consists of molecular mechanisms includes, of course, simple and compound substances. Iron, oxygen, a particle of roast mutton, and a particle of living matter, are all included in one category. All consist, according to Professor Huxley, of molecular mechanisms; but the molecular mechanisms of some of these things must consist of more elements than those of others, and the mechanisms of the living protoplasm are surely capable of movements of a character totally different from those of the oxygen. Moreover, it is certainly remarkable that the molecular mechanisms of all forms of "protoplasm" should contain the same four elements. By abstracting one or more of these, the molecular mechanisms of protoplasm would be destroyed, and yet molecular mechanisms of some kind or other would remain. Mr. Huxley does not tell us how we are to distinguish the simple molecular mechanisms from compound molecular mechanisms, nor how the molecular mechanisms of a simple substance like lead differ from those of a compound like his protoplasm. It would seem that the molecular mechanisms of lead are, according to this hypothesis, as much alive as the molecular mechanisms of living protoplasm, but that the latter are more active than the former. They differ in degree, but not in kind.

Professor Huxley must surely have formed a rather low estimate of the intelligence and critical power of the medical profession, to expect them to be convinced by him that the only difference between living matter and non-living matter is a difference of degree. He asserts that there are complicated movements in the matter of which all living and all non-living matter consists. And, without one word of explanation as to what he means, he tells an audience, consisting of highly-educated men from every part of the world, that "the microcosm repeats the macrocosm, and that one chain of causation connects the nebulous original of suns and planetary systems with the protoplasmic foundation of life and organisation." Is thought, I would ask, to be silenced by such nebulous nonsense as this? So far from anything like a chain of causation having been shown, not two links of such supposed chain have yet been discovered. But the whole chain of causation which connects nebulous originals of suns and planets with protoplasmic foundations is of so nebulous a nature that it scarcely deserves notice. "The microcosm repeats the macrocosm," says Professor Huxley; but, the more

this metaphorical utterance is thought over, the more difficult does it seem to be to get any definite meaning out of it. What particular minute living thing or microcosm is in the least degree like the world, or like the universe? In what respects, for instance, does a monad or an amæba resemble the world? Surely it is time that people of intelligence should really consider what is gained by vague utterances like the above. We have had during the last fifteen or twenty years no end of materialistic suggestions, prophecies, and promises, but little besides incoherence and inaccuracy have as yet been established. One wonders what the representatives of medical science of all nations thought when they were assured that the microcosm repeats the macrocosm, and what meaning was attributed to these words by those who heard them.

The word "like" has been very curiously employed by many physical authorities, and, strange to say, in many assertions to which I could point, "unlike" would be nearer to the exact truth, as, for example, in the following dicta, *unlike* ought to be substituted for like:—Man is *like* a machine; man is *like* a monkey; living matter is *like* white of egg; a living thing is *like* a watch, and a windmill, and a hydraulic apparatus; the body is *like* an army. Now, if any one will point out the respects in which these things are alike, I have no doubt some one will be found who will point out in what respects they are unlike, and then the public will be able to decide which of the two words, *like* or *unlike*, is more correct.

"Vital phenomena," says Professor Huxley, "*like* (*!*) all other phenomena of the *physical* (*!*) world, are resolvable into matter and motion." Here, as in many other cases, Professor Huxley begs the question. The assertion that vital phenomena belong to the physical world is not to be justified by demonstrated facts. No purely physical phenomena are like any purely vital phenomena. How can vital action be of the physical world when it appears and disappears, while the matter with its physical properties still remains? Between the *motion* of the particles of living matter and the *motion* of particles of non-living matter there is all the difference imaginable—an essential, an absolute, an irreconcilable difference. Materialists, of course, assume and assert the contrary; but, instead of wasting time by assertions, why do they not adduce an example of movements occurring in some form of non-living matter exactly resembling those which occur in living matter? Much of our scientific teaching is now intensely and ridiculously dictatorial. Instead of persuading people to consider and admire

natural phenomena, and to think over the wonders around them, some scientific authorities think to spread their views, by threatening to place all who do not agree with them in a class, in which nobody likes to be included, however large it may be.

Professor Huxley, with that curious partiality for contradictory statements which distinguishes many of his utterances, condemns in one place the idea of an "indivisible unitary archæus dominating from its central seat the parts of the organism," and in another tells us that "the body is a machine of the nature of an army." Every army to be of any use must, of course, be under a head of some kind or other, but Mr. Huxley's army has no general or indivisible unitary archæus of any kind. Each soldier is, I suppose, to govern himself under inexorable laws enacted when everything was in the state of primitive nebulosity. The army of Professor Huxley is, as we shall see, the most marvellous of all nebulous machinery yet discovered by materialists.

Now let us admit for a moment that the body may be compared to a "machine" of the nature of an army. How does the comparison help us to understand the nature of the body? For is not the army actually composed of a number of machines of the very same kind as that body machine which is said to be like it? What, therefore, can be gained by the comparison? Obviously nothing would be gained by telling people who wanted to learn about the nature of a sheep that it was like a flock of sheep. But the body is a machine of the nature of an army, and the microcosm contains the macrocosm, and, therefore, possibly the body, according to Huxleyan logic, contains the army. But I may be wrong, for it is not an *army*, but *a machine of the nature of an army*. We have machines of the nature of a watch, machines of the nature of a windmill, and machines of other natures, but the machine which the body is like, is of the nature of an army. But this last "machine" is essentially different from all the other machines because it is composed of living men while machines in general consist of non-living materials. In short, Professor Huxley uses the word machine just as he uses the word protoplasm in speaking of that which is living as well as of that which is not living!

But Mr. Huxley's "machine of the nature of an army" shall be further examined. It will be found to be very peculiar indeed, whether it is compared with machines or with armies. The army of Professor Huxley would not be recognised as an army by any general, or by any soldier in existence. This remarkable army has "its losses made good

by recruits born in camp." This is an excellent idea for increasing the number of soldiers, and may be recommended to the War Office.

In the body "each cell is a soldier," says Mr. Huxley. If so, I suppose each cell has the power of acting, of displaying intelligence, of obeying the word of command, and carrying out the orders of the general. In a few sentences further on, as well as in many papers he has written, he deprecates this view altogether, and talks about vital actions being "nothing but changes of place of particles of matter," and he looks forward to "the analysis of the living protoplasm itself into a molecular mechanism." The body he regards as "a synthesis of innumerable physiological elements," each of which may be described "as protoplasm susceptible of structural metamorphosis and functional metabolism."

After all our work, all our chemical, physical, and microscopical investigation—after all that has been gained by most minute and careful anatomical investigation carried on for many years, Mr. Huxley comes forward, and, in the most public manner possible, tells the world that the body is not like a watch, or a hydraulic apparatus, but an army—but such an army as never has existed and never could exist— an army not to be conceived by the imagination, an army beyond all powers of reasonable conjecture; an army, the fighting power of which would be destroyed not only by the birth of its recruits, but by the necessary phenomena which would precede that interesting event. But, alas! this is not all, for this army of Professor Huxley's, strange to say, is unfit to survive, for does he not tell us that it is certain of defeat in the long-run? Professor Huxley's army is not an army at all, but only an imaginary heterogeneous collection of nebulous impossibilities. It is scarcely credible that such suggestions as those I have criticised could be seriously made in the presence of hundreds of representative medical and scientific men from all parts of the world. You will, however, find them on p. 99 of vol. i. of the *Transactions of the International Medical Congress.*

And what end is served by such comparisons? Are we taught anything by such incongruous metaphors? In what particular is any living thing like a watch, or a hydraulic apparatus, or an army? There is not one of the ridiculous comparisons which have been made which helps any one to form an accurate notion of the nature of any living thing in existence. Half the utterances of this kind serve but to confuse and lead the mind away from the truth about life and the phenomena peculiar to living things. That all this loose,

rambling talk concerning questions which can only be determined by observation, experiment, and reason, should be listened to by intelligent persons, is but evidence of the decay of thought and the general love of submitting to the dictation of a tyrannical, materialistic coterie, which, being at this time very popular, attempts to arrogantly dominate over sense and reason.

He who studies any living thing in existence at any period of its life, or the smallest portion of any form of living matter, will soon be convinced that it would not be correct to say that it was like anything else in nature, except some other form of living matter. For it will be found that certain phenomena which characterised the particular living particle characterise all living particles of which we have any knowledge or experience. Further investigation will convince an inquirer that vital phenomena are not comparable with any phenomena belonging to non-living matter. They are, in fact, peculiar to living matter. Between purely *vital* and purely *physical* actions not the faintest analogy has been shown to exist. The living world is absolutely distinct from the non-living world, and, instead of being a necessary outcome of it, is, compared with the antiquity of matter, probably a very recent addition to it—not, of course, an addition of mere transformed or modified matter and energy, but of transcendent power conferred on matter, by which both matter and its forces are controlled, regulated, and arranged according, it may be, to laws, but not the laws of inert matter.

It is not only one or two of the positions assumed by the materialist that are open to doubt or objection. The whole contention is, and has been during the last twenty years, utterly untenable, because facts have been known which completely controvert all materialistic views which have been put forward. Mere popularity, it need scarcely be said, goes for very little, unless the facts and arguments urged in favour of the doctrines can be shown to rest upon evidence. Neither is it a question of much consequence how confident individuals may be who countenance or endorse the hypothesis, That any vital action in nature is due to physical forces only. Nor can concurrence of opinion on the part of even a large society, or a tendency of thought, however marked, be accepted as conclusive. What is required is, that the arguments advanced in favour of this view should bear the test of examination. Instead of this being the case, many of these arguments have been over and over again conclusively shown to be worthless; and a critical examination more thorough than that to which they have been hitherto submitted

will certainly be so much the more demonstrative of their worthlessness. It is utterly unreasonable to assume, as has been continually done, that the laws which govern vital actions are the very same laws as those which all non-living phenomena obey. There is not at this time a shadow of evidence in favour of such a contention. It rests only upon pure assumption, and is one of the most reckless and most unjustifiable of the many untenable assumptions to be met with in the history of thought. It is opposed to facts of common experience and observation, as, for example, the growth upwards of a tree; but this as well as other facts have been explained so as to fall in with the assumption.

It may be freely admitted that if we attribute to vital power certain phenomena of the living world, which have not been, and cannot be, explained or accounted for by any physical laws yet discovered, we thereby assume an agency which we are unable to isolate or demonstrate, and the existence of which we cannot in any way prove. On the other hand, it is only fair to observe that, if we assume that phenomena peculiar to life will some day be explained by physics, we certainly act in a manner which is not sanctioned by science—we assume, we prophesy, and prophetic assumptions of every kind are contrary to the spirit of science. But, if we accept the dicta of many popular teachers, and assert that these vital phenomena are, indeed, physical, we assent to a proposition which has been actually proved untrue, and which has been shown over and over again to have no foundation, in fact, experiment, or observation. Nevertheless, it may be urged that it is no more incorrect or against the spirit of science to assume that a physical explanation will be discovered at a future time, than to assume that the phenomena are due to a force or power which we cannot isolate, and the nature of which cannot be demonstrated. But is it not in accordance with reason to assume the existence of a peculiar power to account for phenomena which are peculiar to living beings, which differ totally from any known physical phenomena, and which cannot be imitated—and is it not contrary to reason to prophesy that such phenomena will one day be explained by ordinary forces or powers? Notwithstanding all the tremendous efforts which have been made by intellects the most robust to persuade themselves and others of the promise and potency of the molecular mechanisms of their imaginations, up to this very moment, nothing which in the least degree justifies their positive assertions has been discovered. Nothing like a vital phenomenon has been explained by physical science or imitated in the laboratory.

The simple truth is that the essential phenomena of all living beings cannot be explained without recourse to some hypothesis of power totally different from any of the known forms or modes of energy. Any one who allows his reason to be influenced by the facts of nature as at present discovered will feel obliged to admit the existence of vital power as distinct from, and capable of controlling, the ordinary forces of non-living matter. It has been conclusively shown that the laws of vital force or power are essentially different from those by which ordinary matter and its forces are governed. My own views on this matter, put forward during the last twenty years, have, of course, been ignored by materialistic prophets; but it is satisfactory to find that now and then the word *vital* is actually used in speaking of phenomena, not to be explained by physics and chemistry, by some scientific men who, nevertheless, support the doctrine that vital is, after all, but a form or mode of the ordinary physical action of non-living matter. The fact is, those who act thus feel the weakness of the cause they advocate, and try to hide their confusion by vagueness and obscurity of expression. Within a very few years, the hypothesis of molecular machinery will probably be forgotten, and the operation of vital power, as distinct from any ordinary force of matter, will be generally admitted and taught.

Purely vital phenomena are manifested by every form of living matter from the highest to the lowest. They are temporarily resident in matter which has been derived from matter in the same state, and when once vital phenomena have ceased they cannot be caused to recur in the same particles. Although it is frequently alleged that there is only a difference of degree between the changes in living matter and those in non-living matter, no one, as I have stated, has been able to support this proposition by facts and arguments, or to adduce one single example of matter in any state which illustrates the asserted gradations of change from the living to non-living, or from the latter condition to living. The more we learn concerning the ordinary properties of matter the less probable does it appear that these properties will ever be found adequate to account for the facts of living. How can any reasonable person expect that the disposition of the materials used in the construction of any apparatus or organism will be adequately accounted for by a demonstration of the properties of the materials themselves? Material atoms in living things are made to take up certain definite relations with respect to one another which no experiment has shown to be due to, or to depend upon, properties associated with the matter. Nor

is it even conceivable that property which is unalterable should determine movements and the formation of structures which change from time to time, and the form and exact character of which last must have been foreseen and prepared for from the very beginning. The act of construction, the arrangement of material particles according to a definite and pre-arranged plan and for a special purpose, can no more be attributed to the properties of the matter in the case of a living being than in the case of a watch.

The advocates of materialistic doctrines do not offer a suggestion as to the precise changes which occur when what they deem to be merely a compound substance containing oxygen, hydrogen, nitrogen, and carbon, and, possibly, one or more other elements, passes from the living to the non-living state. The new materialists stand alone among all the sects known to history in not being able, nay, in not attempting, to establish their views by arguments or to support their doctrines by appealing to facts and reason. They content themselves with authoritative declarations of the most positive and solemn kind, but which, from a scientific and philosophical standpoint will be pronounced by dispassionate critics absurd and contrary to fact, and, therefore, not creditable to science. They command people to believe, and encourage them to have robust faith, but as for evidence in support of their materialistic tenets they have literally none. If people generally were acquainted with the facts revealed by the microscopic examination of living matter, and would allow their minds to be influenced by what they observed, they would no more believe in the dicta of the materialist than give their faith to an authority who declared that the earth was flat.

The general acceptance of materialistic doctrines is, in itself an indication how little thought is given by most people in these days to the importance of inquiring into the nature of the evidence upon which far-reaching conclusions they too readily receive are supposed to rest. People have been misled in times past by false teaching, and large numbers have become steeped in ignorance, bigotry, and fanaticism. But I do not believe that the most lamentable instances on record have led to results more disastrous, or more likely to prove injurious to the interests of individuals and possibly to nations than this attempt in our own time to establish the weakest and worst form of materialism ever advanced, is calculated to produce in the future. It is bad enough when numbers of people become converts to a system founded on truth more or less perverted, or misinterpreted, owing to the ignorance or mistaken zeal of its exponents; but

the evils resulting are evanescent and harmless indeed as compared with those which must result from inculcating a system which professes to be founded on reason, but which really rests upon fictions and arbitrary assertions,—a system in which fact is appealed to, but is not to be found. Look at it how you may, you will not discover the smallest speck of firm ground of truth upon which to build any form of the materialistic doctrine. The phantom of possible molecular mechanisms,—confusion between mere energy and the power by which it is directed, between a machine and its maker, between designing and making in form and order and for a purpose, and the mere purposeless piling of particles of matter one upon another, or their equally purposeless falling down, are a few of the erroneous comparisons frequently made and accepted as if they were compatible with reason, and even trophies of recent scientific conquest.

By materialism it is sought to reduce vital phenomena to mere attractions, repulsions, affinities, and to annihilate the idea of vital power. Materialism can only be sustained by the suppression of truths and by ignoring facts that are known, and by a most fantastic and reprehensible system of using the same word in very different senses, and in applying the same term to things which widely differ from one another and even exhibit opposite qualities. By intellectual devices which are certainly not creditable to intellect, the absolute and irreconcilable difference between the *non-living*, and the *living*, and the *dead* are ignored by some, and denied by others; *difference of degree* is substituted for *absolute difference*, while *identity* is not unfrequently made to do duty for *diversity*, and *like* is used where *not like* would be more correct.

The CHAIRMAN (the Rev. R. THORNTON, D.D., Vice-President).—I feel some little reluctance on this occasion in asking you to present your thanks to Dr. Beale for his very thoughtful and interesting paper; because, if I were to do so, I should be asking you to draw upon yourselves the wrath of those whom he attacks, and expose you to being called "bigots." (Laughter.) Now, the word "bigot" is a very terrible word indeed, and I do not like to run the risk of having it applied to you. The meaning of the word in Spanish is "whiskers," so that you will see I have very little bigotry about me, and our lady friends none whatever. (Laughter.) But I am afraid we cannot fall back on etymology. The fact is, that the term bigot is used nowadays

to signify a person who holds certain opinions and sticks to them because he has good reasons for doing so; and, such being the case, I have no difficulty in asking you to acknowledge yourselves bigots by thanking Professor Beale for his very admirable paper. (Applause.) We shall be happy to hear any one who would like to address us upon the subject; but, as time is precious, I must ask those who do speak to be good enough to keep themselves closely to the point, and to make their remarks as brief as possible. I presume I may thank Professor Beale. (Applause.)

Rev. F. C. Cook, D.D.—I merely wish to put this point. Can any man say that he has ever seen the mechanism of a molecule? If no man can say he has seen molecular mechanism, is it not, I ask, in itself a huge assumption?

Mr. C. J. W. Pfoundes.—An illustration occurs to me with regard to one who had attained some considerable notoriety. It is stated that at one time, when addressing an admiring circle of his friends, he was laying down the law, in the egotistical and dogmatic manner which is the wont of the particular class of persons to whom Professor Beale has alluded; he informed his audience how he occupied his time, from early morning until late at night,—how he devoted every moment of his waking hours to some special purpose, until the disciples who surrounded him began to look upon him with awe; at length, however, one of them, less reverent than the rest, exclaimed, "But, sir, you have not allowed yourself one moment to think!" This seems to me to be pretty much what we find, in the case of most of the specialists of whom we hear so much, whose ability we cannot doubt, and whose energy and devotion to their hobbies no one would be disposed to revile. In driving their several hobbies along the narrow grooves to which they are confined, they seem to be quite oblivious to many important things. As a searcher after knowledge, and one who has battled against difficulties at home and abroad for many years, I have been very much disappointed on coming home, and hearing some of our great men speaking in public, on scientific matters; and have had occasion to feel anything but confidence in some of the statements made, especially on matters of every-day life, —statements which I have known to be erroneous. When I look around and see the results of the fallacies which the scientific world (of course, speaking generally) puts forth, I am bound to express my great disappointment, and say that modern thought is indeed going in a direction which impairs the intellectual and moral elements in mankind. I am sorry to say, that many of the professors who come before the world seem to be guilty of what is neither more nor less than dishonesty. They distort facts, in order to bring them into their own narrow groove, for the bolstering up of some point that may be under discussion at the moment. There are many points connected with the subject that would have been very interesting to discuss, could we have had a copy of the paper beforehand. I had expected to hear a little more about the decline of modern thought, rather than so much in the way of combating the specialists of the

time; and I regret that something has not been said more directly showing wherein the decline of modern thought is to be noted. In our modern schools we find some attempt made to teach the classics, but nothing seems to be done with the view of turning the wisdom of our ancestors to practical account. Everything in the way of education nowadays is "cram," and as soon as a student has been "crammed" sufficiently to enable him to "Pass an Exam," he goes out into the world and there is no further effort to cultivate thought. This is one of the things that require attention; for, in these days, when everything is measured by its immediate return, there is great danger in neglecting the culture of intellectual thought.

Mr. F. WRIGHT.—I was sorry to hear the last speaker refer to what he termed the dishonesty of many of our professors of science. During the last twenty years I have made myself familiar with pretty nearly all that has been written by Professor Huxley and Professor Tyndall, and nearly all that Professor Beale has written, and I am bound in common candour and fairness to say I have never yet detected dishonesty in any of these writers. We need not go so far for an explanation of the defects which have been so admirably pointed out by Professor Beale. I must admit that I have never seen those defects made to appear so flagrant, or so mercilessly dealt with as they have been to-night. I am willing to own that with respect to some of the points that have been dealt with I should like to re-consider my views; but, subject to this, I wish to place before the meeting one or two considerations in bar of the broad conclusion Professor Beale has invited us to accept. His broad conclusion is that the evidence in respect of the development of materialistic ideas is evidence of the decline of thought. Now, I do not think it gives any such evidence. First of all, I put it to you that he has brought before us only one aspect of thought, and has confined himself to one set of men. If we take a wider view, the matter assumes a less serious aspect, and we see that what these men have done in this respect may be looked on, if compared with the general work they have done in other departments of science, as little more than a diversion or amusement.* Both the names cited here to-night are those of men who have done honour to science, and the memory of whose work will live for centuries after the idle dreams which we have heard exposed are forgotten; but what these gentlemen have done,—these great contributors to the intellectual movement of the present age,—is that, along with their laborious endeavours in the pursuit of important scientific truths, they have placed before the reading public, as if they were established theories, what cannot and ought not to be deemed anything more than idle, dreamy hypotheses, and mere starting-points for further inquiry. (Hear, hear.) This is the great fault of the present day, and it

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* But one often involving most serious issues, and then all the more open to criticism as coming from writers of such position and influence.—ED.

is partly due, not, I think, to wilful dishonesty, but rather to enthusiasm of temperament and the association of an ambitious imagination with great knowledge and habits of close inquiry. I think there is nothing in more striking contrast than Professor Huxley earnestly and eagerly expounding an individual scientific truth, and the same man advancing a number of truths strung together in the form of a plausible hypothesis. The man in his two aspects is a totally different man ; and what I say with regard to Professor Huxley is equally true of Professor Tyndall. There is in both these men, along with keen intellectual power and great knowledge, a most dangerous imagination ; and not only this, but both have a remarkable power of exposition which I do not think I overstate when I say that it often completely runs away with them. All of us who have ever attempted to write for the public, and who have permitted ourselves to become enthusiastic on a theme upon which we have long meditated and in which we have become deeply interested, and have felt the glow of composition as we have found ourselves making a great point in a nice rhythmical, beautifully-rounded sentence,—all of us, I say, will remember how hard it was to strike that sentence out, though perhaps we may not have been able to see any great amount of sense in it. (Laughter.) I, for one, plead guilty to having passed through this experience, and when I catch Tyndall or Huxley writing such a passage I turn the page to see what I can come upon on the other side, saying to myself "This is a man to be neither followed absolutely, nor put aside lightly." (Hear, hear.) Having said this, let me also say that the fault is not all on their side. It is very much on the side of the public,—I mean, the reading public. We are living in an age which is very peculiar. I do not think there is any decadence of thought ; but there are ten thinking now where there was only one thirty years ago, and from many of those who do the thinking for us we are getting very poor stuff. We are setting large masses of the people reading, and all they require is a general idea of things given in a plain form so that it can be easily grasped, and when they get this they are satisfied and cry out, "What a clever man ! so clear ! so convincing ! so logical !" And what follows ? Why, nine out of ten,—of course all here belong to the "one" and not to the "nine,"—fall down and do worship. We put the author on a high pinnacle ; he is a Professor ; we applaud and follow him blindly, worshipping him as these men have been worshipped by the great mass of mankind, and thus we spoil him. As long as we continue to follow him without question, ready to applaud his high-sounding sentences and accept his theories without having the courage to demand that he should prove his case, we may be sure that we shall be treated with the same sort of stuff we have been receiving for the last few years. There is another thing for which the public at large are also to blame. They do not laugh when there is plenty of cause for laughter. If some of the wild statements made by a few of our scientific men, instead of being implicitly accepted as they often are by the public, were only treated as they have been treated by Professor Beale,—that is to say,

if we met them with a little sound intellectual chaff and ridicule,—we should soon chaff them out of existence. (Hear, hear.) We have the remedy in our own hands, and if, instead of dividing ourselves into two classes and dubbing this man as a theorist and that as orthodox, we were to analyse fairly, and debate, and consider the questions that are being discussed, we should very soon break up this sort of thing. It has not been going on very long. It is but a phase of the intellectual fever through which the suddenly-aroused mind of the nineteenth century is passing. How long that phase will last depends very much on the way in which we meet it. Personally I have been indebted more than I can express to Dr. Beale for having saved me from an abyss into which I should have fallen ten or twelve years ago had it not been for his writings. I had been captivated by the splendid imagery in which some of these materialistic writers have placed their views before us. But the work on "Vital Action" by Professor Beale brought me back from the dream into which I was falling, to where I was when I first took up Mill's *Logic* as a student and determined on following, fact by fact, line by line, and to accept no theory until it had been established. Professor Beale did me this service; and I am delighted on the present occasion to see him here and to be able to tender him my personal thanks. (Applause.)

Mr. J. HASSELL.—I take it that the meaning of Professor Beale, in speaking of the decline of thought, is, not that there are no thinking men, but that the great mass of the public receive what is put before them without thinking. They accept the conclusions arrived at by scientific men, without endeavouring to ascertain whether they are true or not. I saw this exemplified a short time since at a meeting for the purpose of discussing the question of evolution. Many of those who took part in the discussion, instead of basing their conclusions on what they themselves had discovered, merely said that they accepted the hypothesis because Professor A and Professor B had said it was proved. Here, then, were men who, while they were capable of exercising their own minds, did not do so; and, more than this, they showed their narrow-mindedness by regarding as bigots those who thought it right to express a contrary opinion on the matter. For any one to say, "You must accept what Professor So-and-so says, or else you must be wrong," evidences, to my mind, a decline of thought, and this is what I take Professor Beale's meaning to be.

Mr. D. HOWARD, V.P. Inst. Chemistry.—There are few things more attractive than the unities taught by modern science. There is a great charm in the study of such propositions as the correlation of force and the conservation of energy, and in the reduction of astronomical truths to simple laws, but there are few things that ought to be more carefully guarded against than being carried away by the fascination of simplicity, and endeavouring to explain a thing by known laws before we have got to the bottom of what it is we want to explain. There is no subject upon which we are more liable to this danger than the problem of vital force, with regard to which Professor Beale

has given us his warning. Certainly, it would simplify our conception of the matter if vital force were reducible to another mode of motion. It is, no doubt, very inconvenient that there should be such a material difference between Professor Huxley and boiled mutton (laughter); but somehow or other we do differ from pigs, or from white of egg. Chemists are undoubtedly unable to explain the difference between the elementary form of original substance which builds up organised bodies in its living and in its dead state; but I do maintain that it is an offence against the true Baconian method to assume that vital energy is only another mode of force. There is not the smallest proof that the cessation of vital energy produces the development of any other force that is measurable,—that the difference between the living and the dead is molecular motion. It was a reproach against the scientific men of bygone years, that they discussed the question of whether a living or a dead fish weighed the heavier; but the question was not so utterly absurd if we assume that vital energy is merely a form of molecular motion. I do not say it follows that if that were so it would affect the weight of the fish, but it would undoubtedly affect molecular motion in some direction. There must be a distinct, ponderable, or measurable amount of force expendable in some other way, and those who assume that the living and the dead are the same, are bound to get over the chasm which undoubtedly exists between the living and the dead, and show what is the force of which they speak, to measure it and show why it should not be expressed by foot-pounds as much as any other form of molecular motion. But I must say, that when we take the popular expositions of this question we are met by very ugly results. Not that ugly results justify bad science, but they make us strict in our inquiries as to what is bad science. There are many persons who, owing to the spread of science,—and it certainly is for the most part spread very thin,—teach a good deal more than they suppose. When these persons say that men are mere machines,—mere self-acting organisms,—they forget that the people they are instructing are quite sharp enough to say, "Then we are not responsible." (Hear, hear.) Perhaps I am getting beyond the philosophical and into the theological, if I say there is a deeper danger behind; "God is not the God of the dead, but of the living;" all faith in God, all religion, morality, and responsibility would be at an end if man were a mere machine. I do not mean to say that those who take different views from mine about vital force necessarily differ from me on these fundamental questions; but I do say to them, "Be very careful how you use the expressions so commonly employed; be very careful how you accept what, after all, are utterly unproved hypotheses,—even if they be more than vague metaphors—as to men being machines;—or you will find that a logical conclusion is drawn by those who are intelligent enough to seize any mode of escape from personal responsibility, and sharp enough to make a very ugly use of this freedom from responsibility." (Hear, hear.)

Mr. E. CHARLESWORTH, F.G.S. (a visitor).—I hope I may be allowed, while paying the highest possible compliment to the author of the brilliant

essay we have heard to-night, to say, with regard to the view he has taken of the decline of thought, that I differ from him *in toto*. I entirely agree with the observations so ably and judiciously put forward by Mr. Wright, and I think that so far from there being at the present day a decline of thought in progress, we ought rather to call this, *par excellence*, the age of thought. If we want to see the evidence of this, we have merely to contrast the tone of the current periodical literature of the present day with what it was twenty or thirty years ago. You can scarcely take up a periodical of high standing at the present time without seeing some article or other relating to modern thought. In fact, we have a periodical so called, which I think may be taken as the type of one special feature of our current literature. I agree also with the same speaker in saying, that, combined with this amount of thought, there is an undoubted tendency at the present day,—more than perhaps at any former period in the intellectual world,—to allow dogmatism to flourish in certain quarters. As a case in point, I may perhaps allude to that very remarkable feature of our researches in natural science which relates to the earliest forms of organic life on this planet: I refer to what has been said about the famous organism—if organism it may be called—the *eozoon canadense*. When Dr. Carpenter first came before the scientific world and told us that whole mountains of the bottom rocks, which are always looked upon as the rocks that produced the sources of life, are made up of nothing more nor less than forsaken life, every one bowed before him and believed what he said. But now, sir, by degrees, an entirely new phase has come over our thoughts in relation to this so-called early form of life in the bottom rocks. We are at length beginning to believe that Dr. Carpenter was wholly in error. For my own part, I will not go so far as to say that he was in error; but, at all events, the evidence is perfectly evenly balanced; and yet for some time the dogma of Dr. Carpenter completely triumphed. As a Fellow of the Geological Society, I am aware of the enormous amount of labour Dr. Carpenter has bestowed upon the subject. At one time there was a tendency on the part of men of science generally, to receive what Dr. Carpenter said—often without any investigation—simply because it came from him; now, however, a complete change is coming over the aspect of things, and many men of eminence are saying that Dr. Carpenter has made a grand mistake. It is one of the most unfortunate features of the present day, that there is so much bowing to authority. At the same time I must repeat, that this, perhaps, of all others, is the age of thought. I would only add, that I desire to tender my most sincere and grateful thanks to Professor Beale for the able and interesting paper we have listened to to-night. (Applause.)

Mr. W. Watkiss Lloyd.—A speaker has touched on the point that this is not so much an age of decline of thought as of decline of courage. In this I perfectly agree with him. He holds that we are apt to be dominated by dogmas, and this must be due to a decline of courage; for I do not think that thought, in any age, can be said to be in full vigour unless

it is supported by a good deal of courage. This deficiency of courage with respect to the subject of the paper we have listened to is visible in two quarters,—it is seen among scientific men in the first place, and it is also evidenced among the public. I think there can be no doubt that we outsiders observe that scientific men are, to a certain extent, cowed by the force of the authority which resides on the side of the materialistic dogmas. There is a degree of prudence that will operate to check men in any particular pursuit; as Sir Walter Raleigh said, "If a man follows truth too closely at the heels, he may chance to have his teeth dashed out"; and there is a feeling also, that unless a person follows closely the current of what is popular and fashionable, he may ultimately find himself left very much in the cold and may suffer accordingly. I must say there is, to a certain extent, the same sort of feeling in the arts, if I may be allowed to refer to them in illustration. People feel that they must be in the fashion. Take the case of an architect. He may have a strong taste for the Classical; but people will have the Gothic style, and, much as he dislikes it, he finds that he must build Gothic houses. Love of peace degenerates into a want of courage on the part of the public, who bow to what they find to be in vogue. There is the same sort of feeling in other matters. A good many of us know what it is to be in a minority on political questions. You cannot open your mouth as one of the minority without finding that you are in an unpleasant position, and the result is that you hold your tongue. And this, I am afraid, is very much the case with regard to scientific questions. You trace it not only among the public at large, but also in the literature which addresses the public. Science, we all allow, has sustained a great loss in the death of Darwin, whose genuine services I may be allowed to say, though I am not a scientific man, will always be appreciated. But the advocates of the Darwinian doctrine have put it in the strongest way, that the theory of evolution is so absolutely established that no person worthy of consideration, no man in the scientific world, especially, can or does stand up against it for a moment. But we know that this is not the fact, and that there are truly scientific men who do not hold the Darwinian view. I was lately reading an article in the *Saturday Review* on the death of Dr. Darwin, and I took notice of a fact which I regard as evidence of the want of courage I have referred to. The writer, in referring as an adherent to the theory which we are told by Professor Huxley is absolutely established, still only spoke of Darwin as having made it exceedingly probable. Indeed, the word "probable" runs quietly through that article from beginning to end. Now, what, I ask, was this a sign of, but that the writer did not consider the theory absolutely proved, and at the same time had not the courage to say so emphatically? (Hear, hear.) I agree with a speaker who has addressed us this evening in so instructive a manner, that every one, even among the general public, ought to have the courage to speak out on these occasions, and, when he finds these things taken for granted, should ask one or two plain questions. In that case it would no longer

be understood that the world at large, scientific and unscientific, is accepting, as established, theories which are simply ingenious hypotheses. There is no doubt that at the present moment scientific men are apt to be very much like inventors. As soon as an inventor has a happy idea he rushes off to take out a patent for it. It is pretty much the same sort of thing with some of our scientific men. A scientific man has got hold of a good idea, which he thinks may turn out to be true some day, and he at once announces it as a positive fact, in order to be beforehand with it; if it turns out to be all right, he is sure to be praised for his profound sagacity, and if it does not why, then, it will possibly last his time, and that is sufficient. (Laughter.)

Professor ODELL.—Professor Beale has shown us that materialism, with which he deals, is a cause of the decline of thought. I think, if we each asked ourselves the question, we should be unable to find a greater cause than that of materialism in producing this decline of thought.

The CHAIRMAN.—Perhaps, before Professor Beale replies, I may be permitted to say a few words as to the question of dogmatism; and on this point I think we must all feel indebted to one gentleman who has found a little hole in our armour. I am afraid that we of the Victoria Institute are rather apt to dogmatise a little ourselves, and I think we should be careful, as far as possible, to avoid this fault. It is, doubtless, very pleasant to be able to say in a sweeping manner, "You are wrong"; but we must guard against doing so, especially as we are so ready to notice that our adversaries are very apt to do it. We ought to weigh ourselves in the same scales as those in which we weigh our opponents. Perhaps I may be permitted to call attention to the distinction between the words "dogmatic" and "dogmatism." A dogmatic statement is a statement which is not hypothetical. When a truth is ascertained to be either demonstrable, or so highly probable that it is morally certain, we assert it dogmatically and not hypothetically, and there is no harm in such an assertion being made dogmatically. Galileo, for instance, only asserted hypothetically that the earth moved round the sun; but we, in the present state of astronomical science, are able to make the assertion dogmatically. It would have been wrong in Galileo to have asserted the fact dogmatically, and it would be wrong in us to assert it hypothetically. But dogmatism is a different thing, and means the assertion dogmatically of what we ought to assert hypothetically. When a man arrives at a certain conclusion and thinks it is true, he foresees the induction or other logical process by which he will prove it; and when, so thinking, he is able to prove it, he asserts it as proved, saying that others who differ from him are wrong; that is dogmatism. It is this that we should be very careful to avoid. We should guard ourselves against asserting a thing as proved until it is proved, and should not consider that anything is disproved until it is really disproved. (Hear, hear.)

Professor LIONEL S. BEALE.—I think the members of this Institute have been extremely merciful to me in the discussion of my paper, which I fancy contains some points that might have been criticised with much more severity

than has been displayed in any of the remarks made to-night. Perhaps I may almost consider that I deserved such criticism; because in attacking some of the views that are put forward one is obliged to use pretty clear, and sometimes very plain, language, otherwise little interest is excited, and there is not much likelihood of a response. There is a certain number of assertions that have been put forward,—I will not place the word "dogmatic" before "assertions,"—by scientific men during the last few years, which undoubtedly do require, on the part of those who advance them, a great deal of explanation. I have alluded to several of these in my paper; I dare say I could easily find twenty, and I think I could find fifty, but I have not thought it necessary to do so. I have taken, as an example, the assertion that man is a machine and that all his actions are mechanical. Now, this is very imaginative, very pretty, and appears, at first sight, very clear; but, when we come to consider it carefully, it does not require much science to see that man is without any single attribute to which it is right to apply the word "machine." A machine has certain characteristics which are totally different from any a man can find in himself, and if he goes to those who have knowledge, and asks for an explanation, he will find that it is much nearer the truth to say man is not a machine, and has not a single action which can answer to that description. Of late years many such statements have been put forward, and they have excited much interest, not only among the public at large, but in such societies as this. It seems to me that the Victoria Institute may well take up some of these views and discuss them, as we have been discussing certain statements to-night, but going, perhaps, a little more into detail. I have had fault found with me for not putting forward arguments or stating the circumstances that have led me to make certain dogmatic assertions in opposition to certain other dogmatic assertions. It would take up the entire night to bring forward the whole of the facts that have induced me to draw the conclusions I have set forth, as against the assertion that vital action is merely a change in the form of energy. The question is, of course, a very large one. A good deal has been said and written about it, and there is a great deal more that might be said; but, as several speakers have remarked to-night, in this age, although it may truly be called the age of thought, we are certainly desperately tyrannised over. There can be no doubt about the fact that people naturally feel some diffidence in giving their opinions on such matters as I have dealt with, although their opinions may be right, and not only do they fear to give their opinions, but they are also afraid to discuss these subjects and ask questions upon them; for there is no more searching mode of discussing many of these matters than that of putting questions. For instance, it is said, that man is like an ape. Suppose I were to ask Professor Huxley in what points man is like an ape? Do you think he would answer me? No; he would try to put me aside; otherwise he would have to state where the resemblance lay, bone for bone, muscle for muscle. Then I should reply, "Take a bone; which bone will you have?" Then he would select a bone,

and it would be easy to show that, instead of the two being alike, they are unlike. There is not a process, there is not an eminence on the bone which is not different from that which he says it is like. There may be a likeness in some places, but it is not fair to say that the two are alike. A great deal more might be said with regard to the same sort of language. It has been stated that I have been somewhat merciless; but the gentleman who thought so was so merciful to me, that I hardly like to criticise what he has said. The questions which I have dealt with are not mere evanescent notions, just passing through the mind; they are matters that affect people who think at all in a most important way, and some of the deepest ideas that exist in the human mind are unquestionably greatly influenced by the views an individual may thus be led to take as to the nature of life. The whole argument is a very long one, and can, of course, only be discussed in parts. I have dealt with a portion of it to-night, in the hope that I might be able to help the discussions of this Institute, rather than with a desire to ventilate my own views on the subject. With regard to the question of criticism generally, I would say, that if criticism should cease, scientific inquiry must unquestionably come to an end. Criticism is the soul of the whole thing, and I think Professor Huxley himself has said that it is the soul and essence of science. But people who venture to criticise are too frequently put down, and the result is that there are many men who dare not express their opinions. Many years ago I felt a certain amount of diffidence in doing so myself, and no one, from what I have written, can form a notion of the strength of the convictions I have acquired. One does not want to create a "to-do." Still, if any one likes to take up these doctrines, I see no harm in it, except where they are taken up on data which cannot be substantiated; and this, of course, is at least irritating and unpleasant to any one desirous of ascertaining the truth. But when it comes to being accused of being "orthodox," that, I must confess, is a thing I very seriously resent. Dr. Tyndall, I may mention, instead of answering some observations I had made, merely stated that they were the opinions of a Professor who was distinguished as belonging to a college well known for its orthodoxy. This sort of treatment is puerile, and no one likes to be answered in such a way. The fact is that every criticism I have made, and every word in the paper I have read to-night, might have been written by an atheist. There is not a sentence in what I have put forward that could convict me of any religious opinion whatever. I have dealt with the matter from a purely scientific point of view. What I say is, Let us treat these subjects simply as matters of reason and argument, and never mind to what conclusions we may be led. Let us have the facts on each side, and see which view is nearest to the truth. That is the way in which these questions ought to be considered; but it is not the way in which they frequently are considered. Certain statements are put forward in the most positive language, and a good deal of terrorism is exercised over those who presume to differ from them. This I regard as very unfortunate. All I want, and I am sure it is all which those who are on my side want, is fair dis-

cussion. Let every subject be ventilated to the greatest possible extent. I feel assured, as Mr. Lloyd has remarked, that there is a decided lack of courage, not only among scientific men, but also among the public at large; and it is due to this fact that there is much less discussion on these questions than there ought to be. (Hear, hear.) If societies like this were to take up and discuss subjects of this kind more frequently, they would do great good, and their discussions would excite great interest. All that honest people, who are working at these questions can desire, is, that they should be thoroughly ventilated and examined from every point of view. I am extremely grateful for the way in which the few remarks I have made this evening have been received, and, as I have already stated, I am doubly thankful for the merciful manner in which my paper has been treated. (Applause.)

The meeting was then adjourned.

ON THE NEW MATERIALISM.*

By Lionel S. Beale, F.R.S.

I propose in as few words as possible to ask those present to consider certain views bearing on the first principles of religion and philosophy which have exercised during recent years and continue to exercise an extraordinary influence upon the opinions held by many persons of intelligence. Acquiescence in the views in question, I think it will be found, involves the acceptance of ideas which are not consistent with one another, of doctrines which are contradictory, and principles which are incompatible or even mutually destructive. To give this fashionable confusion of doubt, denial, assertion, assumption, conjecture, prophecy, any name which has been already adopted by any philosophic or religious sect that has existed in the past, would be unjust, for the conflicting opinions now entertained cannot be formulated, and it is doubtful whether, among those who have consented to adopt them generally and vaguely, any two persons could be found who would agree concerning the elementary propositions on which anything like a philosophy could be established. Neither of the terms Rationalism, Materialism, Agnosticism, is strictly applicable to this most recent and most fanciful of all the creeds ever offered for adoption. To call it Rational-

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* Being an Address delivered in July by the Author, and specially revised by him for the Victoria Institute. It is inserted here by reason of its importance.—Ed.