

## LECTURE IV.

## CONTEMPORARY OR SCIENTIFIC MATERIALISM.

## I.

MATERIALISM as a reasoned theory of the universe,—materialism as a philosophy,—is more than two thousand years old. During that long period it has had various fates and fortunes. It has at one time ebbed, and at another flowed; it has suffered many checks and defeats, and has also enjoyed many successes and triumphs. It has never been more than partially and temporarily vanquished; it has sometimes seemed as if it would carry all before it, and leave no foe undestroyed. Its least sympathetic critic must admit that it has shunned neither conflict with the most formidable antagonists nor the scrutiny of the doubting and discussing intellect; that, on the contrary, its course has been a continuous campaign against all kinds of powers and principalities in the name of free thought and scientific truth;

and that when it has prospered, it has not been under the shadow of authority, but in the light of reason. It may be true that whenever it has been widely prevalent, moral, social, and political influences have contributed to its diffusion; that interests and passions have often been as helpful to it as reasons. But the same may be said with equal justice of all systems. No doctrine rests exclusively on intellectual grounds, or triumphs merely in the strength of pure reason. Materialism, it cannot be denied, has constantly appealed to reason, and has prevailed most in epochs characterised by activity of reason. It has not faded and decayed, but grown and flourished, with the increase and expansion of scientific light. It was never more prevalent than in the present day, when the spirit of investigation is everywhere obviously and energetically at work.

Materialism could never have thus lasted and flourished had it not been a very plausible theory. It could never have had the history which it has had unless it had much to say for itself. Make full allowance for interests and passions operating in its favour, yet interests and passions can only sustain and propagate either themselves or any doctrine or movement when they are accompanied by the persuasion that reason is on their side. Nothing is more impotent than mere passion—blind passion,—except it be mere interest

—interest consciously separated from or opposed to truth. Materialism must be able to adduce in its favour arguments which are fitted to impress and convince both the popular and the scientific mind. Its claims to acceptance must rest on grounds which, while not recondite or difficult to understand, are yet of a kind calculated to satisfy many intellects which have been disciplined by physical science.

That this is the case I must endeavour to show. It is clearly impossible to examine in a single lecture even a very few of the most celebrated vindications of contemporary materialism, while it would hardly be fair or satisfactory to discuss merely one of them. It seems necessary, therefore, to treat of contemporary materialism, or, as it is sometimes called, scientific materialism, in a general way. This requires that I should begin by indicating as comprehensively as is consistent with brevity the general character of the argumentation which is employed in its support.

In the first place, then, materialism claims to satisfy better than any other system the legitimate demands of the reason for unity. There cannot be more than one ultimate explanation of things. If the variety of existences in the universe are traced back to two or more causes, the intellect must sooner or later perceive that it has stopped abruptly and left its work incomplete. The two

or more causes which have been reached necessarily limit and condition one another. Whence and why are they thus bounded and associated? The question cannot be evaded. Reason demands an answer to it, and no answer can be found in the several finite and co-ordinate causes themselves; it must be found in a single higher cause on which they are dependent. It is only by reaching unity that we can get above the limits and conditions which are conclusive evidences of dependence. Hence every form of dualism must be rejected as a theory of existence. Only a monistic philosophy can be a true philosophy. But theism, say materialists, is essentially dualistic. It traces the diversity of phenomena in the universe not to one cause, but to two causes. It refers some things to mind, and other things to matter, and maintains that matter and mind are substantially distinct. It leaves us with two principles, and by so doing virtually reduces even the one which it pronounces infinite to something finite, while it renders it impossible for us to conceive of the connection between matter and mind otherwise than as arbitrary. Materialism, on the other hand, is monism. It explains the whole world in terms of matter. It resolves everything in nature—order, organisation, life, sensation, thought, poetry, religion, history—into combinations and motions of matter. It exhibits the universe as a perfectly

homogeneous and coherent system naturally evolved out of a single primary existence. It thus satisfies the demands of philosophy or rational theory for unity. Idealism, it is true, sets up rival pretensions. It professes to start with the self-identity or absolute unity of thought, and to explain matter as a stage in the development or as a phase of the manifestation of thought. But are not its claims obviously less satisfactory? We know nothing of ideas or thoughts except as states of human consciousness, as affections or products of that in ourselves which we call mind. They are special phenomena in the life or experience of men, and men are themselves only a species of natural existences—a class of animals—apparently the last evolved in the terrestrial sphere of things. Man is included in the universe, and ideas are included in man. Reason consequently requires us to seek the explanation of man and ideas in what is common and primary in the universe—matter and motion. To attempt to explain what is ancient by what is recent, the general by the particular, the macrocosm by the microcosm, universal existence by the modifications of highly specialised organisations, is a monstrous *ὑστερον πρότερον*, a manifest violation of the laws of scientific method. Thought, which is independent of human consciousness, can only be affirmed to exist by an arbitrary act of the individual mind,

and is no real principle, but a mystical assumption ; thought, which is dependent on human consciousness, can no more be the unity which accounts for the universe, than the characteristic features of the leaves of a particular kind of tree can be the sole and adequate explanation of the entire vegetable kingdom.

Further, materialism claims to be the only theory which satisfactorily shows that all things have come to be what they are in a truly natural manner. When describing the evolution of the universe from unity to multiplicity, it appeals to no arbitrary or imaginary factor, no principle which is supernatural, no process which transcends or contravenes science. It represents the universe as a self-consistent and perfect system, in which everything that happens follows necessarily from the powers inherent in the system itself. Theism, on the contrary, supposes that the universe in itself is incoherent and imperfect, and that the explanation of many things in it must be sought for out of itself. It conceives of the matter of the world as created ; of its powers as derived ; of its order as contrived ; and of certain events and existences comprehended in it as produced by special acts of Divine interposition. Such a view, say materialists, is essentially anti-scientific. It implicitly denies not only that the world is a scientific unity, but that its phenomena are expli-

cable in a natural manner, whereas the chief end of science is to show that the world is a systematic unity, and that all its phenomena can be naturally explained. Idealism may, indeed, be here again opposed to materialism. Idealism also professes to account in a strictly natural manner for all that is explicable. It starts from the unity of a single principle, and has recourse only to immanent processes, excluding entirely acts of supernatural interference. Idealism, however, it will be replied, breaks down the moment it is brought into real contact with external nature. The supposition of its truth implies that the various operations of the physical world can be explained by the laws of an impersonal and unconscious dialectic; that mechanical, chemical, and organic processes are essentially notional or rational. But this is a hypothesis which physical science will not allow us to entertain. The attempt to interpret mechanical, chemical, and organic facts in connection with it has always resulted either in caricaturing or contradicting the explanations of them given by physical science. In other words, it has invariably led to dualism of the worst kind,—the dualism which consists in irreconcilable antagonism between philosophy and science. Hegelianism supplies us with a striking illustration and proof. Hegel and his followers saw more clearly than the idealists of any other school had done that it was

incumbent upon them to show that nature was a system of which the processes were the stages and expressions of an immanent logical evolution, and they laboured strenuously and ingeniously at the task. What was the result? A so-called philosophy of nature, which physical science is forced to condemn as a gigantic swindle. In the Hegelian philosophy of nature, idealism made evident its scientific bankruptcy. It is very different with materialism, which accepts and incorporates the whole of physical science without alteration or perversion; which founds upon the results of physical research, and tries to extend its principles and apply its methods as far as is legitimately possible.

A closely-connected excellence claimed by materialism is that of being the most intelligible of systems. It is maintained that we never truly understand a fact or process of which we cannot form a distinct and precise image or picture. Whenever a thing is scientifically explained, the mind is enabled to form to itself a definite and clear conception of how that thing came to be what it is. But pseudo-explanations—as, for example, those given of natural phenomena by ancient and scholastic philosophy—are invariably vague and mystical. Can anything, however, except matter and material processes, be definitely and minutely imaged? Can anything else be estimated with quantitative accuracy? Can there be

any *exact* knowledge—*i.e.*, science—so long as material properties are not reached? The materialist answers all these questions in the negative. And, at the same time, he contends that the theistic mode of accounting for the universe by the creative fiat of an Eternal Being is particularly unintelligible. Such a supposition seems to him to be one which cannot, properly speaking, be realised in thought at all. A man may verbally express it, and even fancy that he believes it, yet it is in itself essentially inconceivable.

From preliminary considerations like the foregoing, the materialist may proceed to what is strictly his argument, which still remains to be stated. It consists in maintaining that the facts of nature do not in any case demand for their explanation a principle or principles distinct from matter. The properties of matter are the sole, the direct, and the immediate objects of the senses. They confront the mind from the earliest dawn of consciousness, and are apprehended by it long before self-reflection is elicited. Touch, taste, sight, hearing, and smell, all converge on matter, and constrain us to commence with it. Before we abandon it and its properties, the necessity of having recourse to a distinct substance with distinct properties must be clearly made out. In the inorganic world no such necessity arises. Yet it is a world rich in differences, presenting a vast

variety of constituents and forces, of stages and processes, of colours, sounds, savours, and odours. The objects of one sense are quite unlike those of another, and light, heat, electricity, and magnetism appear to be entirely distinct. But examination discovers everywhere an essential sameness. It was the glory of the atomic or materialistic philosophy of ancient Greece to have recognised that the diversity of things was only secondary; that underneath the phenomenal variety was real identity; that all qualitative distinctions might be resolved into quantitative distinctions. This truth has not only been fully confirmed in modern times, but has been brilliantly supplemented and completed by the great discovery of the correlation of forces. Light, heat, electricity, magnetism, chemical affinity, and mechanical motion, have been ascertained to be convertible. Any one of them may be transformed into any other. They are but modes of the movements which take place among the molecules of matter. They are but the metamorphoses of a common force, which is unchangeable in amount although variable in quality.

Does the anti-materialist argue that, however the case may stand with the inorganic world, organisation cannot be conceived of as a product of molecular combinations and mechanical forces? Does he contend that there is a chasm or gulf between inorganic and organic nature, and that

materialism fails to bridge over the distance between the one region and the other? It may be replied that this is an argument based not on knowledge but on ignorance, and addressed not to knowledge but to ignorance. Because we do not know that purely physical forces can construct a living cell as we know that they can build up a crystal, we infer that they cannot do the former. But logic warrants no such inference. A solution of continuity, a chasm, in knowledge is no proof that there is a solution of continuity or chasm in nature. Ignorance cannot be legitimately reasoned from as if it were knowledge.

Further, Is not the gap in science being gradually filled up? Is not knowledge as it advances making it apparent that there is no gap in nature at the point indicated? In the light of recent science we cannot but vividly realise that matter is capable of transformations so diversified and wonderful that we must be very cautious before we venture to assign limits to its powers of adaptation, change, and efficiency. The same particle of it may in succession be a constituent of a drop of dew, of an invisible vapour, of a crystal of snow, of a mineral, of the stem, sap, flower, or fruit of a plant, and of the flesh, blood, bone, or brain of man, performing necessarily very different functions in the several instances. Crystallisation is a process scarcely less marvellous in itself and in its

results than growth. Why are we not to believe that in the latter process no less than in the former every molecule is placed in its position not by any external power, whether creative mind or vital principle, but by attractions and repulsions due to the natures of the molecules themselves? If matter can display in special circumstances the structural powers exhibited in crystallisation, why may it not in other, perhaps more complex circumstances, manifest the organic powers witnessed in vegetable and animal growth?

It was until recently supposed that there was a chasm which could not be bridged over between the very chemistry of inorganic and organic bodies, and that no animal substances could be compounded by the chemist. This doctrine is now overthrown. The supposed break in nature which was regarded as indicating the presence and intervention of a distinct principle in organised structures is now found to have been but a blank in our knowledge. "Not many years since," says Mr Spencer, "it was held as certain that the chemical compounds distinguished as organic could not be formed artificially. Now, more than a thousand organic compounds have been formed artificially. Chemists have discovered the art of building them up from the simpler to the more complex; and do not doubt that they will eventually produce the most complex."

That the matter of organic bodies is the same as that of inorganic objects has, of course, a very important bearing on the question whether or not vitality is resolvable into the mechanical properties and chemical processes of matter. What that bearing is I shall leave it to Professor Huxley to state. Treating of the "Physical Basis of Life," he writes: "Plants are the accumulators of the power which animals distribute and dispense. But it will be observed that the existence of the matter of life depends on the pre-existence of certain compounds — namely, carbonic acid, water, and ammonia. Withdraw any one of these three from the world, and all vital phenomena come to an end. They are related to the protoplasm of the plant as the protoplasm of the plant is to that of the animal. Carbon, hydrogen, oxygen, and nitrogen are all lifeless bodies. Of these, carbon and oxygen unite in certain proportions, and under certain conditions, to give rise to carbonic acid; hydrogen and oxygen produce water; nitrogen and hydrogen give rise to ammonia. These new compounds, like the elementary bodies of which they are composed, are lifeless. But when they are brought together under certain conditions, they give rise to the still more complex body, protoplasm, and this protoplasm exhibits the phenomena of life. I see no break in this series of steps in molecular complication, and I am unable

to understand why the language which is applicable to any one term of the series may not be used to any of the others. We think fit to call different kinds of matter carbon, oxygen, hydrogen, and nitrogen, and to speak of the various powers and activities of these substances as the properties of the matter of which they are composed. When hydrogen and oxygen are mixed in a certain proportion, and the electric spark is passed through them, they disappear, and a quantity of water, equal in weight to the sum of their weights, appears in their place. There is not the slightest parity between the passive and active powers of the water and those of the oxygen and hydrogen which have given rise to it. . . . Nevertheless, we do not hesitate to believe that, in some way or another, the properties of the water result from the properties of the component elements of the water. We do not assume that a something called aquosity entered into and took possession of the oxide of hydrogen as soon as it was formed, and then guided the aqueous particles to their places in the facets of the crystal, or amongst the leaflets of the hoar-frost. . . . Does anybody quite comprehend the *modus operandi* of an electric spark, which traverses a mixture of oxygen and hydrogen? What justification is there, then, for the assumption of the existence in the living matter of a something which has no

representative or correlative in the not-living matter which gave rise to it? What better philosophical status has 'vitality' than 'aquosity'? And why should 'vitality' hope for a better fate than the other 'itys' which have disappeared since Martinus Scriblerus accounted for the operation of the meat-jack by its inherent 'meat-roasting quality,' and scorned the materialism of those who explained the turning of the spit by a certain mechanism worked by the draught of the chimney?"

The mere chemical analysis of inorganic bodies, then, proves that as to substance or matter they are identical with inorganic objects. But science, it is contended, carries us much farther, not merely inferentially from this unity of composition, but directly by demonstrating that what is called vital force is simply mechanical and chemical force transformed through the special conditions under which it acts. The human body is as incapable of generating force as is a steam-engine or a galvanic battery. It only distributes the force which it receives from the world without, and varies its manifestations to the senses. Its every action and process—walking and climbing, pulling and pushing, respiration and digestion, assimilation and excretion — can be shown to be either a mechanical or chemical operation. The force displayed by animals in muscular contractions is entirely derived from the energy stored up in the

food which they consume. The heat which is diffused through their frames is due to chemical combination. Digestion is simply a form of combustion. The circulation of the blood is indubitably a mechanical movement effected by mechanical force. What room is left in organisms for a vital force essentially distinct from the inorganic powers of matter? It is unnecessary to dwell longer on an argument which has been so often presented to the English public in the brilliant expositions of Professor Tyndall.

The significance of the doctrine of evolution must also not be overlooked in the present connection. A few years ago every group of organisms called a species was supposed to have originated in a direct creative act or miracle. Now, this hypothesis is almost universally abandoned. Its place is occupied by Darwinianism or some other form of the development theory. An enormous mass of facts has been collected from astronomy, geology, geography, biology, linguistics, &c., and presented in a light which has convinced most scientific men that from a few organic forms, if not from a single organism, of the simplest kind, all organised beings have been gradually, naturally, and necessarily formed and distributed. But if this theory be true (and those who deny its truth must disprove it), obviously the probability is very great that, as there has been

no supernatural interposition in the course of the evolution of organic beings, so there was none when life and organisation first began to be, and consequently, that no absolutely new principle, no immaterial vital force, was then abruptly and inexplicably inserted into nature.

If it be admitted, on the strength of the foregoing and similar considerations, that even a single vital cell may have originated in the laboratory of nature, under peculiar conditions, from the combination of inorganic elements and the action of chemical and mechanical forces, it can be left to the Darwinian theory of development to explain how that single cell might, in the course of millions on millions of years, by successive infinitesimally minute modifications, be the source from which every plant and animal in the world has derived its life and organisation. In so far as biology accomplishes, or attempts to accomplish, this task, it may be held to be simply a stage or section of the materialistic theory, and materialism to be identical with biological science.

It will be said that there is an impassable barrier between vegetable and animal life—that plants can never have risen into animals, nor animals degenerated into plants. Mr Spencer has thus answered this argument when replying to Dr Martineau: “This is an extremely unfortunate objection to raise. For though there are no

transitions from vegetal to animal life at the places Mr Martineau names (where, indeed, no biologist would look for them), yet the connection between the two great kingdoms of living things is so complete that separation is now regarded as impossible. For a long time naturalists endeavoured to frame definitions such as would, the one include all plants and exclude all animals, and the other include all animals and exclude all plants. But they have been so repeatedly foiled in the attempt that they have given it up. There is no chemical distinction that holds; there is no structural distinction that holds; there is no functional distinction that holds; there is no distinction as to mode of existence that holds. Large groups of the simpler animals contain chlorophyll, and decompose carbonic acid under the influence of light, as plants do. Large groups of the simpler animals, as you may observe in the diatoms from any stagnant pool, are as actively locomotive as the minute creatures classed as animals seen along with them. Nay, among these lowest types of living things it is common for the life to be now predominantly animal, and presently to become predominantly vegetal. The very name *zoospores*, given to germs of *Algæ*, which for a while swim about actively by means of cilia, and presently settling down grow into plant-forms, is given because of this conspicuous community of nature. So complete

is this community of nature, that for some time past many naturalists have wished to establish for these lowest types a sub-kingdom, intermediate between the animal and the vegetal: the reason against this course being, however, that the difficulty crops up afresh at any assumed place where this intermediate sub-kingdom may be supposed to join the other two. Thus the assumption on which Mr Martineau proceeds is diametrically opposed to the conviction of naturalists in general."—Cont. Rev., June 1872.

There remains the barrier of mind or consciousness. The materialist maintains that science proves that matter is, in this case, also an adequate principle of explanation. All the powers of the human mind may be traced to roots in the lower animals. The life of the body and its functions are manifestations of the same generic principle as the so-called life of the soul and its functions. There is only a difference of degree between the highest mental and the lowest vital faculties. There is no absolute break or distinction, but, on the contrary, a continuous progression along the entire psychological line which runs from the *protogenes* and *protamœba* to Plato and Shakespeare, and yet in the two former the motions, which are the evidences of their animality, are scarcely, if at all, distinguishable from the contractions and expansions of certain colloidal

substances. The doctrines of the correlation of forces and of development are as applicable to the explanation of mind as of life. Mind is force, the highest development of force, the force which is accumulated in the brain and nerves ; and mental force is as exactly correlated with vital and with physical force as these are with each other. It may be proved by a variety of scientific considerations that all forces come under the same generalisation. Motion, heat, and light, may be transformed into sensation, emotion, and thought ; and these may be reconverted into motion, heat, and light. The theory of development has been employed with success by a host of investigators in the elucidation of all kinds of mental phenomena. The result has been to show that the phenomena peculiar to human psychology may be resolved into simpler states, and that these may be traced backwards and downwards until the primordial properties of matter are reached.

The argument for materialism may now, perhaps, be fitly concluded in the words of Professor Huxley: "I take it to be demonstrable that it is utterly impossible to prove that anything whatever may not be the effect of a material and necessary cause, and that human logic is equally incompetent to prove that any act is really spontaneous. A really spontaneous act is one which, by the assumption, has no cause ; and the attempt

to prove such a negative as this, is, on the very face of the matter, absurd. And while it is thus a philosophical impossibility to demonstrate that any given phenomenon is not the effect of a material cause, any one who is acquainted with the history of science will admit that its progress has, in all ages, meant, and now more than ever means, the extension of the province of what we call matter and causation, and the concomitant gradual banishment from all regions of human thought of what we call spirit and spontaneity. And as surely as every future grows out of the past and present, so will the physiology of the future gradually extend the realm of matter and law until it is coextensive with knowledge, with feeling, and with action. The consciousness of this great truth weighs like a nightmare, I believe, upon many of the best minds of these days. They watch what they conceive to be the progress of materialism, in such fear and powerless anger as a savage feels when, during an eclipse, the great shadow creeps over the face of the sun. The advancing tide of matter threatens to drown their souls; the tightening grasp of law impedes their freedom; they are alarmed lest man's moral nature be debased by the increase of his wisdom."<sup>1</sup>

<sup>1</sup> See Appendix XV.

## II.

A general view of the argument in favour of materialism has now been laid before you. My next duty is to examine whether or not the reasoning which it includes and involves is valid.

Is it true, then, I ask, that materialism satisfies the legitimate demands of the reason for unity? I grant that reason, when in quest of an ultimate explanation of things, imperatively demands unity, and that only a monistic theory of the universe can deserve the name of a philosophy. While aware that the desire for unity has given rise to countless aberrations, and that it needs to be carefully watched lest it create factitious unities when it fails to find real unities, I yet unhesitatingly acknowledge that it originates in, and is the expression of, the very constitution of rational thought, which can never regard a number of co-ordinate causes as other than a group of secondary causes. But the question is, Is materialism monism? or, in other words, Is matter one? I answer, No. Matter cannot possibly be conceived of as properly one. Materialism is necessarily multitudinism, and as such must inevitably be pronounced an essentially unphilosophical and irrational hypothesis.

The world presented to us by the senses and

immediate consciousness is certainly not one, and is held by nobody to be one. It is a vast complex of objects, agencies, and conditions—stars, stones, plants, animals, light, heat, electricity, thoughts, feelings, volitions. Its contents may have a unity imparted to them by generalisation, but merely a unity which is given to them from without and for a purpose,—a unity which depends on the point of view from which things are considered. There may be any number of such unities; there may be even more of them than there are things. Real unity cannot be thus reached. Nor is it thus but by analysis that materialists seek it. Things may be resolved into their elements; compounds may be reduced to simples. This process of analysis might conceivably take us far towards a sort of unity in a strictly scientific manner. I cannot indeed admit its sufficiency to take us quite even to the unity of a single physical element, for no such element, no single entirely uncompounded element, can ever produce another. Two physical elements may produce a third, but no one element can ever produce anything. It must for ever remain itself. There is, however, no obvious reason why analysis should not have proved that there are only two, or at least a very few, physical elements, out of which have been formed by successive combinations all material substances, the so-called elements included. But it has in reality

done nothing of the kind; it has not taken us a step towards unity. The ancient Greek philosophers believed the elements of matter to be far fewer than do our modern chemists. It is just the reverse of the truth to affirm that the tendency of physical research has been to demonstrate the unity or simplicity of matter. Chemical science may display that tendency in the future, but it has not displayed it in the past. Even if we are content to ignore mind, to treat psychical elements as if they had no existence, scientific analysis takes us to about sixty-four ultimates instead of to one ultimate. Had the number been much smaller—had it been only two—it would still have been a result incompatible with a materialistic monism. Reason cannot acquiesce even in two ultimates, although much less, of course, in sixty-four.

It may very well be that many of the substances which chemists at present call elementary are not simple. Spectrum analysis and the phenomena of allotropy suggest the conclusion that some of them are complex. It is free to any one to conjecture that they have all been formed by compounding and recompounding absolutely indecomposable and homogeneous units. But it is free to no one to put this forward as more than a conjecture, or to conceal that the analysis of the so-called elementary substances might result not in dimin-

ishing but in increasing the number of substances which would have to be admitted, at least provisionally, as ultimate. In the present state of our knowledge this is just as legitimate a conjecture as the opposite. We have as yet no properly scientific reason for believing that the elements of matter are really fewer than they are supposed to be. We are very far, indeed, from being entitled to affirm that there is only one physical element. But until this conclusion is established, the original of the materialist cannot even be regarded as *one in kind*. His matter is not all of the same sort. It is essentially a multiplicity of things specifically distinct. It cannot, consequently, be the basis of a monistic system of thought.

Let me, however, make to the materialist an enormous concession, and one to which he is not entitled. Let me suppose him to have done what he has certainly not done—to have proved what he has merely conjectured—namely, that there exists but a single truly elementary physical substance. Let me, further, not press him with any of the perplexing questions which suggest themselves as to the nature of the wholly undifferentiated, absolutely homogeneous matter which his single primordial element must be. Matter, let it be granted, then, is reducible to a single physical constituent. That proves matter to be of *one kind or sort*. But does it prove it to be *one*? This is

the decisive question, and obviously the only possible answer is a negation. A pure, homogeneous, physical element is not in the least a real unity. It is an aggregate of parts, each of which is as much a substance as the whole. You may take a portion of it from one place and another portion of it from another place—a yard, say, or a mile distant—and these portions may be perfectly alike, yet they are also perfectly distinct. The one is not the other. They are not identical; not one. A physical element, therefore, although entirely pure and unmixed, is necessarily a multitude. It consists of as many substances as it consists of atoms. Real unity is precisely what it has not and cannot have in itself. To talk of materialistic monism is, therefore, as self-contradictory as to talk of a circular square. It is a kind of speech which betrays intellectual bankruptcy.

The unsatisfactoriness of materialism as regards the demand of reason for unity becomes only the more evident when we take into consideration the fact that force is always combined with matter. This fact is disputed by no one, but opinions differ widely as to how matter and force are combined. Is matter the cause of force? Is force a result of matter? An answer in the affirmative is, perhaps, the only one which materialism can consistently give. It is an answer, however, which satisfies the principle of unity at the ex-

pense of the principle of causality, and is, besides, inherently unintelligible. How can matter be the cause of force or any other effect unless it have force to cause the effect? A matter which produces force without force is a cause which is destitute of power to be a cause. Matter which is mere matter—matter which is antecedent to force—is matter which explains nothing; and that such matter should, in a universe of which the original principle is matter, be always and everywhere accompanied by force, is a greater mystery than any contained in theology or metaphysics.

Hence the majority of materialists have preferred to represent matter and force as at once inseparable and co-ordinate. According to this view both are ultimate, and the one is not related to the other as cause and effect. But what, then, becomes of the unity or monism of the materialist? It vanishes, and in its place there emerges a duality by which he cannot fail to be embarrassed. But the difficulty which he has now to encounter has been so accurately and comprehensively stated by Professor Calderwood, that quotation will completely serve my purpose. "The perplexity of the problem under a materialistic theory is not lessened but increased when duality of origin is assigned, by introducing Force in addition to Material Substance. Duality of existence, with co-

eternity of duration, involves perplexity sufficient to bar logical procedure. This duality of existence implies diversity of nature and mutual restriction; and these two, diversity and limitation, raise anew the problem which they were meant to solve. The explanation needs to be explained. Again, matter and force are postulated primarily to account for motion, but in accounting for motion, they are proved insufficient to account for existence. That which needs to have force exerted upon it in order to be moved is not self-sufficient, and the same is true of the force which needs matter on which to exert its energy." — *Hand-Book of Moral Philosophy*, pp. 235, 236.

Force may be conceived of as neither the effect of matter nor co-ordinate with it, but its cause. This is a not uncommon view, and much may be urged in its support. But obviously, if it be true, materialism is erroneous. Matter is in this case not what is first in the universe—force is before it; and indeed matter, when thus reduced to a mere effect of force acting on sense, is virtually abolished as a substance. The universe of matter is resolved into a universe of force. The force may, however, be conceived of as merely physical force. Would this universe of physical force be a unity? Certainly not. As physical force—force indissolubly associated with a material manifestation—it could merely be *force of one kind, not one force*. It must

necessarily be as divisible, as multiple, as its material manifestation. The force in one place could not but be distinct from the force in another place. A world of physical force must be a world which is simply an aggregate of physical forces.

It follows from what has been said that the world can have no real unity either in mere matter or mere physical force. If reason is to find the unity it seeks, it must go farther and deeper; it must not stop short of an immaterial cause of matter, of an indivisible source of divisible forces, of a power which can give to what is essentially multiple the unity of arrangement and plan. Monism can have no other solid basis than the truth that the universe "lives and moves and has its being" in a single creative and providential Mind, "of whom, through whom, and to whom are all things."

We have next to examine whether or not the claim of materialism to be a system which proceeds on principles that are strictly natural and scientific, is well founded. It seems to me that it is not. One of its principles is that there is nothing in the universe except matter, and what is explicable by matter; that to refer to anything else as a cause is to appeal to an arbitrary or imaginary factor. Now, whatever the affirmation here may be as a conclusion, it is plainly irrational and unscientific as a principle. The man who

begins investigation with it comes to nature with an *à priori* dogma, and insists that she shall only tell him what he already wishes to believe. That is not scientific, but essentially anti-scientific. Genuine science demands that nature shall be allowed to speak for herself and be believed, whether she teaches that the principles required for the explanation of her phenomena are few or many. No factor ought to be pronounced arbitrary or imaginary until proved to be not required for the explanation of facts. The materialist, if he would be truly scientific, must be content to wait until he has finished his argumentation against the spiritualist and the theist before he affirms that to trace effects to God or the soul is to appeal to an arbitrary factor. But where are there materialists to be found who are willing to do anything of the kind? I know of none. Almost without exception, materialists assume at the outset that science is bound to recognise only material causes, and their whole argumentation is largely dependent on this assumption.

A second principle of materialism is that the higher must be explained by the lower, the superior by the inferior. Comte was perhaps the first clearly to point out that this is the universal and distinctive characteristic of materialism. It accounts for force by matter, for the orderly by the unorderedly, for the organic by the inorganic, for

life by chemistry and mechanism, for thought, feeling, and volition, by molecular motions in the brain and nerves. It assumes that this is the peculiarly and exclusively scientific method of procedure. But the assumption is unwarranted so long as the anti-materialist can argue on rational grounds that this so-called scientific procedure is a continuous violation of the principle of causality. And this, I need scarcely say, is precisely what the anti-materialist maintains. He undertakes to show that, at every fresh stage in the materialistic course of explanation, there is more in the alleged effect than in the assigned cause, or, in other words, that there is something in the so-called effect which is traced to no cause, and consequently, that something is implied to be produced by nothing. Materialism professes to accept the axiom that "nothing comes from nothing" more strictly than any other system; but its critics complain that the principle of which it makes the most frequent application is that the greater may be caused by the less—that something may come from nothing. The materialist declares his inability to believe in creation by the infinite power of an infinite mind, but he seems to his opponents to display a wonderful capacity for believing in a whole series of creations out of nothing and by nothing. It is not for me to pronounce at present whether this accusation be well founded or ill

founded. It is sufficient for my immediate purpose that materialism can have no claim to be considered scientific until the charge is disproved. There can be nothing scientific in continuously violating the law of causality.

Yet some persons seem to see nothing irrational even in such violation. The author of a recently published work, entitled 'A Candid Examination of Theism'—an author who writes under the *nom de plume* of "Physicus"—quotes these words of Locke: "Whatsoever is first of all things must necessarily contain in it, and actually have, at least, all the perfections that can ever after exist; nor can it ever give to another any perfection that it hath not actually in itself, or at least in a higher degree; it necessarily follows that the first eternal being cannot be matter." He then adds, "Now, as this presentation is strictly formal, I shall meet it with a formal reply, and this reply consists in a direct contradiction. It is simply untrue that 'whatsoever is first of all things must necessarily contain in it, and actually have, at least, all the perfections that can ever after exist;' or that it can never 'give to another any perfection that it hath not actually in itself.' In a sense, no doubt, a cause contains all that is contained in its effects; the latter content being potentially present in the former. But to say that a cause already contains actually all that its effects may afterwards so con-

tain, is a statement which logic and common-sense alike condemn as absurd." — (P. 21.) Indeed! The affirmation of Locke which is here met with a "direct contradiction," and pronounced "simply untrue," may not have been unexceptionably expressed, but it just means that every cause must be a sufficient cause, — that a weight of four pounds, for example, cannot balance one of ten pounds; and he who meets it with a direct contradiction needs, of course, no contradiction, especially if he has failed to perceive that a cause is only a cause in so far as it displays *actual* power and perfection. It is curious, however, that the writer mentioned should be able to quote an argument to the same effect from Mr J. S. Mill's 'Essay on Theism.' We there read: "Apart from experience, and arguing on what is called reason — that is, on supposed self-evidence — the notion seems to be that no causes can give rise to products of a more precious or elevated kind than themselves. But this is at variance with the known analogies of nature. How vastly nobler and more precious, for instance, are the vegetables and animals than the soil and manure out of which, and by the properties of which, they are raised up! The tendency of all recent speculation is towards the opinion that the development of inferior orders of existence into superior, the substitution of greater elaboration and higher organ-

isation for lower, is the general rule of nature. Whether this is so or not, there are at least in nature a multitude of facts bearing that character, and this is sufficient for the argument."—(P. 152.) One asks with astonishment, Is it really meant to be said that vegetables and animals are wholly caused by soil and manure? Have the sun and parent vegetables and animals, and many other adjacent and antecedent agencies, contributed nothing to their perfections? No sane person has ever fancied that there may not be more in an effect than in any of its partial causes. The question is, Can there be more in an effect than in its complete cause, whether that be a single cause or the sum of a multitude of partial causes? Reason affirms it to be self-evident that there cannot, and not a fact or analogy in nature is at variance with the affirmation. The latest and most elaborate result of development can have no perfection which it has not derived from some of the agents which have concurred in its formation. But whatsoever is first of all things must be the whole cause of all things. Secondary causes cannot add to what it contributes, since they only impart of what they have themselves received from it. Therefore it must necessarily contain in itself all the perfections that can ever after exist. To deny this is wholly to set aside the law of causality. It is not what "Physicus" calls it, a "childishly easy refuta-

tion" of Locke's argument, but it is childish in every respect.

The materialist believes that he takes up a specially respectful attitude towards science, and defers more to its teaching than does the theist. But this, again, is what cannot be granted. The materialist goes to science with a theory which he ought to be content to derive from it, and which must make it impossible for him to study such departments of knowledge as psychology, ethics, and history—not to speak of theology—in an unprejudiced and liberal manner. He cannot but be as incapable of impartiality in estimating the teachings of the mental sciences as the idealist in judging of the doctrines of the physical sciences. The theist, in reality, occupies a far more advantageous position. He can be both just and deferential alike towards the physical and mental sciences; he is committed to no one mode of explaining phenomena; he is bound to accept the facts and laws of all science just as science gives them; and when science shows him that God has operated in nature, mind, or history, otherwise than he imagined, he can, without having any reason to be ashamed, because in perfect consistency with his principles, modify his theology in accordance with the new information which he has received. If force be not explicable by matter—the living by the dead—species by evolution—

mental phenomena by physical properties,—materialism must be erroneous. Were all these positions proved, theism would not be disproved.

The view which is expressly maintained by some, and tacitly assumed by many materialists—the view that only explanations which can be subjected to the verification of the senses, or represented in imagination as processes which the senses might trace if their powers were sufficiently magnified, are truly scientific—is also untenable. Genuine explanation requires, of course, definite thought, and is generally attained in regard to physical things only with the discovery of exact quantitative relations; but thought, which merely recalls or represents sense, is seldom definite, and even in physical investigation the path of progress is from sense towards pure thought. Scientific comprehension is only attained when intelligence has got beyond figurate or pictorial conception, and has freed itself from the material and sensuous elements contained in immediate perception. Scarcely any cause has had a more perverting influence on the study of mental and moral facts than the bias which the mind derives from its familiar converse with the objects of sense to assimilate all other objects to these, and to think of them under material categories, or according to material analogies. The philosopher and the theologian require to be constantly on their guard against being deluded

by the subtle operation of the same cause, seeing that a multitude of religious and speculative beliefs which reason must reject flow from this source. Materialism undoubtedly owes much of its success to habitually addressing the mind in figurate language and through sensuous imagery. Instead of convincing the understanding by strictly relevant reasons, it meets at one and the same time its craving for satisfaction and its aversion to exertion, by hypotheses agreeable to the imagination, because capable of being easily represented in a pictorial or sensuous form. But in the eyes of thoughtful men, this, the great secret of its power, is an evidence of its scientific worthlessness. Materialism must ever be plausible to the popular understanding, but simply, so its opponents think, because it is content to stop short at the plausible and popular.

### III.

Thus far I have only dealt with the generalities of materialism. It is now necessary to come to particulars.

The materialist supposes that there is a matter which precedes every form of mind, and exists independently of all thought. But can he prove this? It requires to be proved, because it seems to many untrue, and even contradictory. Mere

matter—matter in itself—matter as an exclusively objective fact, or as wholly independent of intelligence,—is, they hold, unknown and unknowable matter. It is no more possible, so they tell us, to think of such matter than to think of a centreless circle, or a stick with merely one end. The only matter which by any stretch of mind can be conceived or imagined as even a possible object of knowledge,—thus runs the averment,—is matter which is not alone, but accompanied by mind; matter which is relative to and dependent on mind. But if this be true, on what ground can the materialist maintain that there is any such thing as the matter of which he talks? If that which he represents as the sum and substance and explanation of all existences is an absolute contradiction in thought, what authority has he for attributing to it real being and wonderful powers? If matter is never known and cannot be known to have an independent existence, how does he reach the conclusion that it has an independent existence?

This argument, familiar to the students of Professor Ferrier's 'Institutes of Metaphysic,' completely blocks the path of the materialist, so that he must remove it before he can proceed. Now I pronounce no opinion on the absolute validity of the argument. It signifies not for my present purpose whether it proves merely the truism that

matter cannot be known without a mind to know it, or conclusively demonstrates that matter cannot exist without some mind to perceive or think of it. It is sufficient to remark that there appears to be but one way by which it may conceivably be shown that the argument does not establish all that it was meant to do, and that this way is clearly not open to the materialist. Although the knowledge of matter must always be accompanied by a knowledge of mind, matter and mind may, with at least an appearance of reason, be argued to be known as distinct and independent, and therefore, to be distinct and independent. But the materialist is obviously precluded from thus arguing, because his materialism necessarily involves sensationalism, and sensationalism necessarily signifies that all knowledge of matter is dependent on the particular constitution of the senses of the individual. Matter can be for the materialist merely what it is felt to be, or what it is imagined to be in consequence of being felt. He cannot consistently pretend to any knowledge of it as it is in itself, or to any knowledge of its properties as independent objective facts. The doctrine of real presentationism is incompatible with a materialistic theory of the nature of knowledge; and yet, where this doctrine is not maintained, matter cannot even be seriously argued to precede or to exist apart from mind.

The materialist, then, supposes that there exists a matter which is merely objective or entirely independent of thought ; but he has no reply to give to any one who maintains that he can only know matter as that which is inseparably associated with mind, and essentially dependent upon thought, or, in other words, that the matter by which he pretends to explain intelligence is matter which presupposes intelligence. He thus starts with a fatal self-contradiction, from which he cannot free himself by any alteration or amendment of his views of matter short of entire renunciation of the doctrine that matter is the absolute first of existence—the original of all things. He may cease to think of matter *per se* as possessed of definiteness and form—he may drop out of his conception of it one distinctive property after another—he may resolve it into conditioned, and even into unconditioned force,—but the self-contradiction will cling to him at the last as firmly as at the first. To get rid of it he may commit mental suicide by casting himself into the abyss of the “unknowable ;” but it will hold on by him there more triumphantly than ever, and will not be shaken off until he confess that the unknowable is at least known not to be devoid of knowledge any more than of force.

Materialism, I remark next, affirms that matter is eternal without justifying the assertion. Materialism is manifestly bound to prove the eternity

of matter, since all that is distinctive of the system rests on this presupposition. Unless matter be eternal it must have been originated. The whole argumentation of the theist in support of the doctrine of the Divine existence is designed to show that the world is not eternal, not self-existent. That there is something eternal and self-existent, the atheist, pantheist, and theist, the materialist and the spiritualist, agree in acknowledging. None of them calls upon the others to explain the mystery of self-existence. Every sane mind receives that mystery and credits other minds with doing the same. Doubt and difference of opinion are only possible as to what is self-existent or eternal. Is it mind or matter, personal or impersonal, knowable or unknowable? The theist believes it to be mind, and produces what he deems relevant and conclusive evidence to prove that it is mind. What evidence has the materialist to the contrary, and for believing that matter is that which is self-existent and eternal?

Many materialists have the candour to acknowledge that they have none whatever. They confess entire ignorance on the subject. They are ready to accept as a true statement of their position that made by Professor Tyndall on a celebrated occasion. "If you ask the materialist whence is this matter of which we have been discoursing, who or what divided it into molecules,

who or what impressed upon them this necessity of running into organic forms, he has no answer. Science is also mute in reply to these questions. But if the materialist is confounded and science rendered dumb, who else is entitled to answer? To whom has the secret been revealed? Let us lower our heads and acknowledge our ignorance, one and all. Perhaps the mystery may resolve itself into knowledge at some future day. The process of things upon this earth has been one of amelioration. It is a long way from the iguanodon and his contemporaries to the president and members of the British Association. And whether we regard the improvement from the scientific or from the theological point of view, as the result of progressive development, or as the result of successive exhibitions of creative energy, neither view entitles us to assume that man's present faculties end the series—that the process of amelioration stops at him. A time may therefore come when this ultra-scientific region by which we are now enfolded, may offer itself to terrestrial, if not to human, investigation." Now, what is the precise meaning of these words? Is it not that although until the far-distant future age arrives when there are beings on the earth as much superior to the president and members of the British Association as these are to the iguanodon and his contemporaries, no reason be found for believing that matter

is eternal, self-active, and endowed with the promise and potency of all order, life, and thought, yet men may even now speak and reason as if they were quite certain that it is? But surely, if this be what it means, "the long way from the iguanodon and his contemporaries to the president and the members of the British Association" has been as conspicuously one of progress in absurdity as in science. A man who has no reason for believing that matter is eternal, must not merely bow his head and acknowledge his ignorance, but he must cease ascribing eternity to matter, and confess that he has no right to be a materialist. If, notwithstanding his avowed ignorance and the evidence adduced to prove matter created, he habitually assumes that matter is eternal, what else can be said than that he arbitrarily chooses to believe matter eternal, because he would otherwise be bound to believe it created?

How is it that materialists are in general willing to take their stand in such a position? Is it because they cannot find one more tenable? In other words, is it because the only reasons that can be given for believing matter eternal are worse than none? Perhaps it is. At all events, the only reasons that have been given are so weak that the slightest examination is sufficient completely to discredit them.

A German materialist (Dr Löwenthal) gives the

following as an argument: "What has no end can have no beginning. What cannot be destroyed can also not be created. Matter cannot be destroyed, and consequently cannot be created; it is without end, and therefore likewise without beginning—is eternal." But what right can any person have to assume that "what has no end can have no beginning"? The words I have just quoted may have no end, but certainly they had a beginning; they may be eternal *a parte post* although they were not eternal *a parte ante*, but originated with Dr Löwenthal on a definite day not many years ago. The assertion that "matter cannot be destroyed" needs proof, yet receives none. There is no warrant for saying more than that matter cannot be destroyed by natural powers and processes. There can be no warrant, therefore, for inferring more than that matter cannot be created by natural powers and processes. But this inference is scarcely worth the trouble of drawing. It is unnecessary to take any round-about way to arrive at so easily accessible a truth as that matter cannot create or destroy itself. But the gulf between this plain truth and the assertion that matter cannot be created or destroyed is immense, although materialists have pretended to identify them, being unable to find a passage from the one to the other.

Büchner, Moleschott, and some other material-

ists, teach that physical science has proved that matter is absolutely incapable of increase or diminution, creation or annihilation. Physical science has done nothing of the kind. It refuses to draw absolute conclusions. It carefully abides within the conditions of experience and experiment. It certifies that matter is undestroyed by any of the processes of nature or any of the arts of man, and it infers that what has not destroyed it in the past will not destroy it in the future. It disowns, however, the inference that matter cannot be destroyed or created even by infinite power. It cannot afford so glaringly to violate the laws of logic. It does not pretend to be able to tell what infinite power can do, and still less what it cannot do.

The assertion which Büchner and Moleschott erroneously represent as a generalisation of science, Mr Herbert Spencer far more erroneously pronounces "an *à priori* cognition of the highest order." Of course, neither this nor any other cognition of matter is an *à priori* cognition even of the lowest order. Matter is only known *à posteriori*, and as essentially contingent. No number of the uniformities of experience relative to the nature and properties of matter has been shown to produce one of those absolute uniformities of thought which are entitled to be called necessary or *à priori* truths. We may not be able to conceive a process of creation, the manner in

which the quantity of matter might be absolutely increased, nor a process of annihilation, the manner in which the quantity of matter might be absolutely diminished, but we have no difficulty in conceiving that there should be more or less matter in the universe than there is. It requires no great stretch of imagination to suppose the whole of empty space filled with matter, or no matter at all in space. He who denies that one can truly think the quantity of matter to be increased or diminished—that one can believe that matter has been created or that it will be annihilated—has allowed his reason to be too much influenced by the impressions of sense, and has signally confused empirical generalisation with necessary truth.

The reason most commonly given for regarding matter as eternal is that its creation is inconceivable. Is, then, creation inconceivable? Not in the sense of essentially unthinkable,—not in the sense that a centreless circle or triangular square cannot be conceived,—not in the only sense which would fix creation down as impossible. Is it even inconceivable in the sense of necessarily unimaginable by the human mind? It may be so. Perhaps the mind of man with its present faculties could not be made to comprehend the nature of an act of creation. But we have no right to affirm that such is the case. Its proof would, in fact, require the very knowledge which is pronounced to be

unattainable. If the mind cannot prove creation to be inherently absurd or self-contradictory, it cannot be entitled to pronounce it unknowable; for it knows no other unknowable than the absurd, and it can have no right to affirm anything to be unknowable which it does not know to be so. To know anything to be unknowable is a self-contradiction, unless by the unknowable is meant merely the self-contradictory. We certainly know far too little about the nature of matter—if there be any matter except the manifestation of force to mind—to assert that we could not be made to understand its creation. We are merely entitled to say that we do not understand it, and cannot understand it until our knowledge of the nature of matter is greatly increased. The inconceivability of creation is, in fact, no real unthinkableness, but the natural effect of a weakness of imagination which is amply explained by inexperience and ignorance. It is no reason whatever for setting aside the arguments urged by the theist in favour of the belief in creation. The materialist himself believes in a multitude of facts which are in the same sense equally inconceivable.

It may be remarked, in the next place, that materialism is inconsistent with its own theory of knowledge. It implies that all knowledge is obtained through the bodily organs of sense; that we know nothing except what our senses tell us;

that the limits of sensible experience are the limits of knowledge. Yet it starts, and necessarily starts, with assertions manifestly at variance with this doctrine. It affirms either the existence of atoms or the infinite divisibility of matter. Have atoms ever been reached by any sense? No, they are inaccessible to sense. Can sense prove the infinite divisibility of matter? No; the very notion of sense possessing such a power is absurd. Then, matter is affirmed to be eternal. But is eternity an object of sense? Has any materialist seen or touched eternity? Has any creature ever had an eternal sensation? Again, no. The very men who assert that matter is eternal are found at other times assuring us that we have no idea of eternity, on the ground that all our knowledge is derived from sensation. What sort of system is it, however, which is thus inconsistent and self-contradictory at its very foundation? Surely it is one little entitled to be considered either satisfactory or scientific.

Again, materialism, as I have already indicated, has no reasonable account to give us of force. It is not required, of course, to give us an account of the absolute nature of force in itself. Force is known only through its effects — only from experience. More, therefore, is not asked from materialism than that it shall give an intelligible, non-contradictory view of the relation of force to

matter. But instead of meeting this demand it represents their relationship only in ways which reason and science refuse to sanction. The majority of materialists assert that force is inherent in matter; that matter is essentially active; that matter and force are inseparable, and have co-existed from all eternity. But this assertion is the denial of a fundamental law of physical science—the law stated by Newton in the words, “Every body perseveres in its state of rest or of moving uniformly in a straight line, except in so far as it is made to change that state by external forces.” This law is conclusively proved, both experimentally and by the consequences involved in denying it. If true, however, matter is in itself inert, inactive, without power of originating motion or producing change; and the view of the relation of matter and force, assumed as axiomatically evident by a host of materialists, is anti-scientific and erroneous in the highest degree. If true, the argument of Aristotle for a first mover is plainly a very strong one. If a body cannot move itself it must be moved by a cause distinct from itself, and this external cause, if a body, must be moved by another cause, and so on in a regress which, not to be *ad infinitum*, must end in a cause which is self-acting, and consequently not a body. It has been attempted to meet this argument by affirming that matter is endowed with a property of attraction,

in virtue of which, while each separate molecule of matter is inert, two molecules are active, each being a cause of motion in the other. But the reply is inadequate, as it ignores two important considerations. The first is, that inertia and attraction are not facts of the same rank or value. Inertia is presupposed in all the phenomena of attraction, is implied in every correct conception of mechanical motion, and can clearly neither be eliminated from the notion of matter nor reduced to any simpler property of matter. Attraction, on the other hand, as a cause of gravity, as an efficient property of matter, is an occult and hypothetical quality, in the existence of which few men of science very seriously believe, although they feel themselves incompetent to displace it by any more plausible conjecture. The vast majority of physicists will readily subscribe Newton's words to Bentley: "You sometimes speak of gravity as essential and inherent to matter. Pray, do not ascribe that notion to me; for the cause of gravity is what I do not pretend to know." Many of them will not refuse assent even to his much stronger statement: "That gravity should be innate, inherent, and essential to matter, so that one body may act upon another at a distance through a *vacuum*, without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great

an absurdity, that I believe no man who has in philosophical matters a competent faculty of thinking, can ever fall into it." The materialist is not entitled, then, to assume that the phenomena ascribed to attraction will not in process of time be explained by the general laws of motion. Let us suppose, however, that attraction, instead of being thus proved to be a useless fiction, is ascertained to be a real property and efficient cause. What is it precisely that in this case has been established? Only my second consideration—only a conclusion which materialism cannot accept. Matter is thereby proved to be a something which cannot have its reason of existence in itself. No molecule, on this supposition, is what it is, or is moved as it is, of itself. The cause of the position and state of each molecule is out of itself in all the other molecules. This dependence of each upon all must have a reason which embraces all, yet which can neither be in the parts, since each part is dependent—nor in the whole, since it can have nothing which it has not derived from the parts which compose it.

The hypothesis that matter is essentially active seems not to be tenable. Is there any more plausible view as to the relation of matter to force which the materialist can adopt? Apparently not. The conjecture which has sometimes been

thrown out, and which Dr Löwenthal has deliberately adopted—that force is not essential to matter, but the result of its aggregation—is too ridiculous for discussion. Force can no more be accounted for by aggregation than the strength of a horse can be accounted for by the motion of the cart which it draws. Aggregation presupposes, and therefore cannot explain, force. But no other supposition appears to remain except that matter has the power of putting itself in motion,—has in some degree the faculty of volition or self-determination. This, the supposition which Epicurus and Lucretius adopted, is growing in favour with modern materialists. Anthropomorphism in physics was probably never more prevalent than at present, especially among those who denounce anthropomorphism in theology. Confidently deny freewill to man and confidently ascribe it to atoms, and you stand a good chance just now of being widely acknowledged as a great physical philosopher, and are sure at least of being honoured as an “advanced thinker.” But nonsense does not cease to be nonsense when it becomes popular. The notion of an atom of matter putting itself in motion is a still more glaring contradiction of the law of inertia than an atom eternally and necessarily active. It also confounds matter and mind, and even nature and miracle. It may be taught as a truth of physical science, but it is

in reality a delusion due to metaphysical nightmare.<sup>1</sup>

Further, materialism leaves unexplained and inexplicable the order, laws, and harmony in nature. Material elements chaotically combined and material forces working blindly, atoms jostling together at random and powers unconditioned and uncorrelated by intelligence with a view to an end, cannot be rationally thought of as producing these things. The universe is a result which implies that its hosts of constituents have been prepared and arranged, and that the hosts of forces associated with them have been directed and marshalled, by a Divine Intelligence. Order universally reigns, where elements out of which confusion might have arisen and might still arise are present and abundant; all things proceed under the influence of laws, unfailing and unerring, which apply at once to the minutest part and to the mightiest whole; contingencies are constantly provided for by a system of compensations of the most elaborate and exquisite description; and of these facts, as I endeavoured to show when treating of the design argument, the materialist can either give no explanation or devises explanations which are futile in the extreme.

Is life also a fact which presents a problem that materialism cannot solve? Is there a chasm be-

<sup>1</sup> See Appendix XVI.

tween the dead and the living which cannot be bridged over by mere matter and its laws? The debate on this question is at present so extremely keen that its importance in a religious reference is, it seems to me, in danger of being exaggerated. Materialism must be refuted before we reach this point, if it is ever to be refuted. Were spontaneous generation proved, materialism would remain as far from established as before. Those who are certain that there is a God may with perfect composure leave it to science to ascertain under what conditions He has caused life to appear. In fact, the question as to the mode of the origination of life, although of immense scientific interest, is of very subordinate religious significance. It is, further, a question which is often answered in a dogmatic and anti-scientific spirit. Many assert that it is absolutely impossible that life should originate from the interaction of molecular forces, while materialists in general demand that the contrary should be conceded from the outset. Both parties are in error. We cannot tell what is possible or impossible in such a case, prior to a comprehensive knowledge, such as science seeks to attain, of all that actually is. We have even no right, it seems to me, either to deny or to admit that it is conceivable that under certain conditions life may originate in inorganic matter. Our power of conception is dependent

on our means of conception, our data, our acquaintance with relevant facts. What we cannot conceive to-day science may make conceivable to-morrow; but we must not anticipate to-day what belongs to to-morrow.

Let us appeal, then, merely to facts and science. Do they afford any grounds for the materialistic explanation of the origin of life? Certainly not. So far as our knowledge extends, there is not a single fact to warrant the hypothesis that life has originated from mere matter, from what is inert and inactive. The spontaneous generation of life from the lifeless has often been asserted, and has sometimes been attempted to be proved, but undoubtedly the verdict of science is that organisms arise only from organisms, that life is only produced by that which lives. Endeavours like those of Crosse, and Pouchet, and Bastian, to establish the contrary, have only demonstrated their own futility, and increased the probability that *omne vivum ex vivo* is a law of nature which has no exceptions. No man has ever changed any inorganic matter into a living vegetable without the help of a pre-existing vegetable germ; nor vegetable matter into animal, without an animal germ. All known facts give their testimony against spontaneous generation.

Further, the phenomena of life are very peculiar and quite unexplained by the mechanics and

chemistry of matter. In every living thing, for example, there is a working as a whole, and a working from within, and a working to an end, to which we see nothing similar in the merely inorganic world. Crystals display geometrical regularity and symmetry and variety of species or type, but, as Müller says, "There is in the crystal no relation between its configuration and the activity of the whole." It has the unity which results from juxtaposition and arrangement, but in no degree the unity of reciprocal action and influence which belongs alike to the simplest and the most complex of living beings. In every plant and animal the whole is not merely composed of the parts, but acts as a whole through and by its parts, each part needing, conditioning, and influencing the whole, and the whole needing, conditioning, and influencing the parts. In the inorganic world forces are never seen acting thus, and nothing that we know of the inorganic powers of nature can reasonably lead us to suppose that they are capable of acting thus. Again, all dead bodies are wholly passive, wholly subject to the physical and chemical forces which act upon them, entirely moved from without ; but all living beings, so far as observation extends, are only partially subject to these forces, displaying in addition a certain power of suspending or modifying their operations, of employing them instead of obeying them, of acting

from within as well as of being acted on from without. In this respect every living plant and animal is unlike every dead plant and animal, and every inorganic object. Now, how can this power of acting from within,—one to which there is nothing properly analogous in lifeless matter,—come from without, from lifeless matter? How can mechanical and chemical forces result in a force which resists and rules themselves, and which enables that which possesses it to act of and for itself,—in a faculty of adaptation to circumstances, of selective assimilation, growth, inherent renewal, and reproduction? Further, all that is living is, what nothing that is dead is, an end unto itself. A living being is no mere mean, but to a large extent an immanent whole—that is, one which has its reason of being, its ends of action, in itself. It is a unity of which all the elements, parts, and energies are co-ordinated by a central power to its self-preservation and self-perfection. But this implies plan and purpose, thought, foresight, and prophecy; and how are these to be accounted for by mere matter and motion?

I might appropriately, if time permitted, confirm and supplement what has just been said, by pointing out in the processes of nutrition and growth, in the healing and repairing of injured parts, and in propagation or reproduction, a number of distinctive characteristics which seem imperatively to

demand for their explanation more than merely mechanical and chemical causes. Enough has been said, however, I hope, to show that when Mr Spencer, or any other person, tells us that the argument against the materialistic hypothesis of the origin of life is one in which ignorance is made to do the part of knowledge, he gives a very unfair and inadequate view of it. The argument is based, first, on the universal and uniform experience which establishes the law *omne vivum ex vivo*; and secondly, on what observation and science inform us are the properties of inorganic powers on the one hand, and the distinctive features of life on the other. It is, consequently, based wholly on knowledge. And it is an argument of great strength, completely satisfying all the requirements of the methods both of agreement and of difference. Like all other arguments, however, as to the laws of nature, it does not demonstrate the impossibility—does not absolutely exclude the possibility—that the law may in some unknown case or cases not have held good. This bare possibility Mr Spencer and the materialists eagerly lay hold of, and actually oppose and prefer to the positive argument. Because they can fancy that the powers of inorganic nature may once have acted in a way in which they are never known to have acted, and in which they certainly never act now, they conclude that these powers did really once

act in that exceptional, not to say miraculous, manner. I should like to see it shown that *this* is not to make ignorance do the part of knowledge. In my opinion, the materialist charges upon his opponent the vice of his own reasoning.

But recent discoveries of science, we are told, go far to prove that there is no such chasm as is alleged between the dead and the living, the inorganic and organic. In support of this affirmation, however, real and relevant evidence cannot be found. It is true that until recently many chemists supposed that no organic substance could be artificially composed from inorganic constituents, and also true that a multitude of organic substances have now been so formed. The inference is that chemists may err and may have their errors corrected by experience and investigation, but certainly not that a single forward step has been taken in bridging over the gulf between life and death. Suppose every organic substance—even brain, blood, nerve, albumen, protoplasm itself—to be resolved, as I doubt not every organic substance may and will be resolved, into inorganic elements, and what follows if out of the elements involved no substance can be built up which is not dead, not one which manifests a single vital property? Simply that there is nothing even in the most elaborate organic structures, or in the corporeal parts and elements most closely associated

with vitality, which is essentially different from mere dust of the earth; that the entire body of man himself is but "dust and ashes," and that when you reach what is highest and most admirable in it, the border of the gulf between matter and the living soul is merely touched. How can any person be so illogical as to describe this as filling up or bridging over the gulf?

The assertion sometimes made that life has been proved to be merely a form of mechanical and chemical force, is without the least foundation. What has been proved is, that life does not create force, and that vital actions are carried on by means of mechanical and chemical forces. Life has been shown to do no mechanical or chemical work itself, but it has not been shown that it does not determine the direction in which mechanical and chemical forces work when they are within the living organism; and until that has been shown, nothing has been done to prove that it does not perform a function to which the ordinary physical powers are incompetent. The driver of a railway train does not add to the force generated in its engine, but he has notwithstanding a place and use. A master mason may expend no part of his strength in the actual construction of a house while he is superintending his labourers and builders, but who would consider the proof of that to be equivalent to a demonstration that

he had been of no service, or was even a purely mythical personage?

The argument from evolution to spontaneous generation is clearly not a strong one. The former may suggest a presumption in favour of the latter, but this cannot supply the place of, or warrant us to dispense with, direct and positive proof.

Is there a definite boundary-line between the plant and the animal? Is the organic world divisible into a vegetable and animal kingdom, or is there an intermediate kingdom *protista*? These two questions, it seems to me, are irrelevant in the materialistic controversy, and it is to be regretted that they should have been drawn into it, especially as biology, to which they properly belong, is not yet prepared to give them definite answers, and the danger of making ignorance do the part of knowledge in discussing them is extremely great.<sup>1</sup>

There is, then, a gulf between the dead and the living over which materialism throws no bridge. Science must confess that it needs a power not present in matter to account for life.

Mind, I remark next, presents to materialism a still greater difficulty. No kind of reasonable conception can be formed of a process by which molecular changes will pass into or produce sensation, pleasure or pain, perception, memory, judgment,

<sup>1</sup> See Appendix XVII.

desire, or will. This objection to materialism was admirably put by Professor Tyndall—in words which he has not yet retracted, and which he will find it hard to refute, should he wish to do so—when he wrote: “The passage from the physics of the brain to the corresponding facts of consciousness is unthinkable. Granted that a definite thought and a definite molecular action in the brain occur simultaneously; we do not possess the intellectual organ, nor apparently any rudiment of the organ, which would enable us to pass, by a process of reasoning, from the one phenomena to the other. They appear together, but we do not know why. Were our minds and senses so expanded, strengthened, and illuminated, as to enable us to see and feel the very molecules of the brain; were we capable of following all their motions, all their grouping, all their electrical discharges, if such there be; and were we intimately acquainted with the corresponding states of thought and feeling,—we should probably be as far as ever from the solution of the problem, How are these physical processes connected with the facts of consciousness? The chasm between the two classes of phenomena would still remain intellectually impassable.” Materialism presents itself as an intelligible theory of the universe, and yet it has not succeeded in explaining a single fact in the world of consciousness. It hopes to be able some day to show us

future Shakespeares "potential in the fires of the sun," but as yet it cannot find the sensations of a *protamæba* even in its own protoplasm.<sup>1</sup>

There are two other objections to materialism which are as strong as any that have been urged, but which I must be content merely to indicate.

First, then, materialism is inconsistent with the testimony of our moral consciousness, with the facts of our moral nature. We perceive a distinction between right and wrong; we feel that we are free to choose between them; that we are responsible, however, for our choice; that we are praiseworthy or blameworthy, &c. These perceptions and feelings are facts as certain as any in the world, and the theory which cannot honestly accept them ought to be rejected. But materialism cannot. It must deny them, or explain them away, or invent untenable hypotheses as to their origin.

Secondly, materialism refuses satisfaction to the spiritual wants, aspirations, and convictions of men. It denies the existence of God and of the soul. It acknowledges nothing that is higher than the seen, or better than the temporal. It resolves religion in all its length and breadth into a delusion. It openly threatens to turn it out of the world. But, as we have seen, reason and morality are to be turned out also. Only when reason, morality, and religion have all been got

<sup>1</sup> See Appendix XVIII.

rid of, will materialism have the world to itself. And then the world will not be worth having.<sup>1</sup>

Let me conclude by entirely dissenting from words of Professor Huxley, which I have already quoted in this lecture. His assertion that "it is utterly impossible to prove that anything whatever may not be the effect of a material and necessary cause," is an arbitrary and unphilosophical dogma which need not, however, disquiet us, since up to the present hour no single fact of order, life, mind, morality, or religion, has been proved to be the effect of a material cause. His assertion that human logic is incompetent to show that any act is really spontaneous has no other ground than his strange misconception of what is meant by a spontaneous act,—than the fancy that "a really spontaneous act is one which, by the assumption, has no cause." His assertion that "any one who is acquainted with the history of science will admit that its progress has, in all ages, meant, and now more than ever means, the extension of the province of what we call matter and causation, and the concomitant gradual banishment from all regions of human thought of what we call spirit and spontaneity," only proves that he is more a follower of Comte than he is himself aware of, and has incautiously adopted one of that author's most superficial and erroneous generalisations. His prophecy as to the future would have been differ-

<sup>1</sup> See Appendix XIX.

ent if he had studied the past more thoroughly and independently, although, perhaps, the wisest course would have been not to prophesy at all. He has erred in thinking that it is *the progress* of materialism which alarms its opponents; it is *its spread*—a very different thing—which alarms them; its rapid diffusion when it is making no real progress; the humiliating fact that so many not uneducated persons are thoughtless enough to believe its proud and empty promises, although there are no achievements to justify them. He tells us that “many of the best minds of these days watch what they conceive to be the progress of materialism, in such fear and powerless anger as a savage feels when, during an eclipse, the great shadow creeps over the face of the sun.” I thought that during an eclipse it was over the face of the earth that the great shadow crept; but that is of no consequence. This is, that, although where the shadow of materialism creeps there may be many to believe that there is no sun, the sun is by no means affected either by the shadow or by the foolish unbelief which accompanies it, but remains where and what it was, and when the shadow is past will be seen to be bright, beneficent, mighty, and terrible as ever. They who believe so cannot crouch and tremble before a shadow, whatever those may do who believe that the shadow is more than a shadow,—that it is greater than the sun,—that it will be eternal.