Sir Charles Lyell.
with the author's kind regards

ON THE

MATERIALISM OF MODERN SCIENCE;

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BY

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ON THE MATERIALISM OF MODERN SCIENCE.

THE time is near at hand, if we may judge our age by its tendencies, when the pursuit of science will have to justify itself anew to the reason of mankind. It is not a matter of course that human beings should spend the hours which remain to them, after the necessities of life have been provided for, in exploring the mysteries of Nature or unraveling the threads of history. That great happiness may co-exist with little knowledge is a fact of daily observation. That it increases in this world in the ratio of our intellectual acquirements has never been proved, and is far from probable. We know how often the lives of learned men are melancholy lives. Health injured in the laboratory; eyesight dimmed behind the telescope; strength exhausted in toiling over hills and deserts; time, which never returns, spent in the severities of study or the languor of overwork; all these are the common incidents of scientific research, and must continue to be so while human nature remains the same. And although there are some men in all ages who devote themselves to science by an irresistible impulse, which requires no stimulus, asks for no reason and defies all possible discouragement, this fact, instead of recommending such studies to mankind at large, removes one powerful motive to their general pursuit. For nature will in any case be continually explored by these, her natural devotees; the main truths discoverable at any given period will be discovered by them; the rest will receive whatever practical benefit arises from such discoveries without any effort of

their own, and the utilitarian purposes of science are in this way sure to be attained, at all events to a considerable degree.

The grounds on which the acquisition of knowledge through laborious study, not forced upon us by immediate wants or special instincts, can be seriously advocated, belong altogether to our conception of human life itself, its destiny, its purposes and its proper aims, and these being themselves among the subjects of scientific research, our conclusions concerning them are the most important and fundamental of its products; the elements by which alone we can determine whether its further prosecution can be worth the time and pains it must demand.

Now we are accustomed to take for granted that it is of course worth this time and pains, and the reason is very obvious. We belong to a race which as such has never doubted the immortality of the human soul, and the special form in which this is the belief of Christendom at once determines our views of the nature and ends of life. Mental powers which are to be used, not for fifty years but for ever, are of course worth cultivating for their own sakes here. To fit ourselves for future and endless occupations, not to make an ephemeral life as pleasant as may be while its lasts, is the work suited to our present condition. Nothing in the universe can be uninteresting to us whom the universe itself cannot outlive. No acquisition of knowledge can possibly satisfy our proper wish for it, when the field and the time before us are both of them recognised as infinite. These, which are the mere aphorisms of common sense, are raised into the axioms of philosophy by that conception of higher natures and Power diviner than our own, which is the necessary adjunct of a belief in human immortality in any form; and this belief gives a final reason for unlimited effort

towards our own mental progress, by altogether freeing us from the fear, which would otherwise be overwhelming, that life may slip away for ever while we are only preparing the ground on which no harvest can ripen, and where our labour will have been in vain.

It is this philosophy, deeply planted in all civilised nations of modern times, that causes an intuitive assent to be given to the wisdom of laborious study and of present sacrifice, for the sake of mental growth. It is of course in perfect harmony with Christianity itself, inasmuch as all the reasons that are valid in seeking our own improvement are, from the Christian point of view, still more so if we seek the improvement of others.

But modern science has been coming to some momentous conclusions, which are in their essence destructive of every philosophy of this kind, and if these are true we have no right to take for granted on the existing grounds that the advancement of knowledge must be good for us. The philosophy on which all our habits of thought are founded assumes as its first postulate that two different kinds of being actually exist, and are apprehended by us as existing. We call them matter and mind; body and spirit; the material and the immaterial. We never question the fact that in using these words we are naming two orders of things essentially unlike each other, or that their existence and their difference are intelligible to us. One of the most essential points of difference is in their relation to human life. Human life, so far as it depends on the existence of our bodies, depends on that which is in its nature transitory. The elements of which our bodies are composed appear themselves to be indestructible, but they exhibit none of the phenomena of human life unless combined in this complicated and unstable form. And since different living bodies are successively formed by the combination of the same

particles of matter, no power can reconstruct them so that all should exist again at the same time. A living body is not in fact, but only in appearance, the same being from day to day. If we watch a moving crowd at such a distance that we can see no movement, but only see that the same points are always occupied by similar forms, those forms seem permanent in those positions, and that which changes at every moment may appear unaltered for any length of time. But as in a crowd like this, so in our bodily frames, if each successive particle or union of particles possessed a consciousness of its own, they would have no notion of identity with those which preceded them. Such a notion can only be entertained by a looker-on, and by him only through imperfect observation.

On the other hand, our mental nature constantly asserts its own permanent identity, and while perfectly aware that thoughts, feelings, and all mental operations or states succeed each other, and form a series and a process, it maintains always that these do not constitute a mental being any more than motion constitutes a material particle, and that the being who feels and acts continues the same being, as strictly as the moving particle continues to be the same. All the explanations of what we mean by mental identity either admit this or else they are arguments to prove that successive thoughts and feelings give rise to one permanent thought or feeling, which we call the consciousness of identity; and that the notion thus embodied is untrue. The notion, however, is ineradicable, and forms a necessary part of the philosophy I am considering.

Now the bearing of this part of our philosophy upon the question of human immortality is very clear. To think of a dead body as simply restored to life, and as being then the same living person as before, is easy enough in a certain

stage of ignorance, but becomes quite impossible as soon as we notice what happens to the body after death. This has been everywhere perceived, and the literal identity of bodily forms in a future life does not, I suppose, form part of any theory on the subject. The identity with which we all feel concerned is mental identity. We change our bodies constantly in the present world, and can imagine ourselves inhabiting any sort of external form. But the very forms we now stand in would cease instantly, not only to be ourselves, but in any way to belong to us, if our minds left them and other minds took possession of them.

Now if my mental identity does in fact depend on the existence of my present body, that is, if it depends on the maintenance of this organic form by the constant succession of material particles, replacing each other in one unbroken series, it must follow that when this body goes to pieces in such a way that it cannot be reconstructed, I myself must perish with it altogether and for ever. Another being, exactly like me, might be made, and thoughts and feelings like my own might possibly be given him. But the simple fact would still only be that two individuals precisely similar to each other had lived, and that one of them was dead; not that the dead one was alive again. My existence has no concern in, and no influence upon, the existence of my duplicate. What is really necessary to my continued existence hereafter is that my mental identity should depend on something which does not go to pieces as the body does, or which, if this should happen, does not become the material out of which other beings are made, and which, therefore, it is not impossible to put together again. If the material body constitutes the whole of the living being, this indispensable condition can never be fulfilled, except by the grotesque theory, sometimes adopted, which supposes that the living principle resides in some small, and of course

undiscovered, portion of the body, which in fact is never decomposed.

But if mental existence is a different thing from material existence, that is, if the fundamental postulate of our common philosophy is true, this difficulty never can arise. Whatever the essence of mind may be, we have no ground for thinking that dead minds, like dead bodies, are used up again in the construction of living ones. There is no such reason, therefore, why consciousness may not be restored to the mind which has lost it. The identity of the being is not destroyed by the mere fact that it has ceased to think and feel. The destruction occurs only when the being itself is divided into parts, and these parts become portions of other beings. You may keep a seed for centuries without a sign of animation, yet able to revive and continue the life it had before. But if you once break it up, and let its elements become the elements of other seeds, revival is of course out of the question.

When any doctrine of a future life is presented to us, whether as the inference of reason, or the teaching of authority, or both, the reception we give to it as rational beings must evidently depend on the view we take of this fundamental question. If there is no preliminary objection to the fact asserted, on general grounds, we can weigh the evidence without prejudice, and judge according to its cogency; while if our philosophical views have already placed it among impossible things, we are obliged either to reject all evidence in its favour as necessarily faulty, or else to affirm that there are two kinds of truth while we deny that there are two kinds of being, and to admit that what we see to be impossible may nevertheless take place. The latter view is doubtless held at present by many men of high scientific attainments, but there are no elements of stability in it. When our faith and

our philosophy mutually support each other, there is no reason to fear that either will be overturned; but when they contradict each other, the ultimate destruction of one or both is already certain.

It is this all but universal philosophy which, by asserting two kinds of existence, has made the continued life of the human soul a thing probable in itself, and therefore susceptible of proof by ordinary evidence, and which has thus become the true foundation of our general view of life, its objects, and therefore its motives, and through these its maxims, and the common standards by which we estimate the value of its pursuits; it is this philosophy with all its consequences which is now assailed by the theories of modern physical science, as they are accepted and taught by many of its leaders, and probably by the majority of its younger students. These theories assert that the only existing things known to us are material things, and that if anything of a different nature does in fact exist, we have no faculties by which it can be apprehended. The facts concerning material bodies, their properties and their changes, are therefore the only facts within the reach of human intelligence; the search after anything else is a vain and useless search, and any fancied knowledge on such subjects is fancy only. These views are supported by considering the sources of human knowledge. We become acquainted with things around us only by the action of the physical organs of sense. That action itself is only physical change, and is only brought about by the physical changes of other bodies. All that is thus communicated to us, therefore, is in fact nothing but physical change, and this alone is the substance of all our knowledge.

The full result of these theories is not indeed generally appreciated, is often kept out of sight, and is believed by many to be cancelled by certain explanations, the soundness

of which is vaguely hoped for, but is not vigorously put to the test. But it is clear that, on this materialistic view of things, any belief in human immortality must be founded on the supposition that its inherent difficulties can be got over in some way which is unintelligible to ourselves. But why, then, should we make this supposition? In what manner could we come to know that it is justified? The question is a crucial one, and the inevitable answer is, that the supposition could not be justified.

For if our only sources of knowledge are only able to make us acquainted with the facts of material change, our ignorance of all other facts is necessarily absolute, and no supposition concerning them can have anything to rest upon. Knowledge, like the senses which supply it, is on this theory only a name for material change, and what, then, is meant by knowledge of anything besides? Yet the supposition must be that we do come to know that there is something else, and that this justifies a belief in immortality. That is to say, that, being ourselves purely material, and in relation only with matter and its changes, we yet come to know a fact which material changes not only cannot account for, but cannot so much as render possible in itself. This is the climax of self-contradiction.

Let me recapitulate a little. Our desire for the advancement of knowledge, and our conviction that a great part of life should be devoted to intellectual pursuits, are the result not of a universal and irresistible impulse, but of a reasonable judgment, founded on our general view of human life itself, as expressed by our common maxims concerning it, which are the axioms of thought in this direction. But these themselves are founded on and derived from the assumption that human life is not related to this world only, and that it is not ended with the grave. And this assumption of immortality itself depends on the belief that there are

two kinds of existence, and that the human soul is not the same thing as the human body.

If the fact is otherwise, the doctrine of continued life becomes incredible, or can only be held in defiance of all the inferences of reason. If life is thus shortened to a few brief years, our whole view of it with all its objects must, if we are rational beings, be utterly changed. If it is thus changed, the maxims which serve as guides, and the conduct based upon them, cease to be reasonable since they lose their foundation. The entire theory of life must be re-considered, and, as I began by saying, the pursuit of science will have to justify itself anew to the reason of mankind.

There are philosophers of the purely materialistic school who will not shrink from accepting this challenge, and will undertake to prove that sufficient reason can be given for intellectual and moral culture, even on the supposition that our conscious identity expires with our latest breath. I believe their arguments are futile, and their efforts necessarily vain, but I postpone the discussion of that question. That it is of infinite importance no one will dispute. My object so far has been to show that the question is necessarily raised, if the materialistic doctrine is accepted, and I shall now endeavour to point out to you what I conceive to be the general fallacy of the reasoning which leads to its acceptance by the students of physical science.

On the threshold of the inquiry we are met by the fact that a belief in two kinds of existence, material and immaterial, has been nearly universal everywhere. It is necessary to the materialistic philosophy that this fact should be accounted for, and the task has been undertaken by Mr. Tylor, in those remarkable chapters on Animism which occupy more than four hundred pages in his book on *Primitive Culture*. Very few, I believe, have read these chapters

carefully. It is a work of considerable labour; and even the sense in which Mr. Tylor uses the word Animism is perhaps unknown to many. He means by it the doctrine of spiritual beings generally; the belief, that is, in some kind of existence which is not material. He shows by an enormous accumulation of details that this belief is not a product of recent civilisation, but is universal among all savage tribes. Adopting the savage theory as to the origin of existing races, he assumes that civilised man has inherited this belief from his rude ancestors, and that the grounds on which they acquired it are therefore the grounds on which it really rests. He then considers in what way the lowest races can have acquired it, and he finds an answer to this question in the effect of dreams upon the imagination of savages. Dreams are common to all men. The beings we seem to meet in them appear to us to be really present. But we find their bodily forms have not been really present. Hence an inference that they have a second form which is independent of the body. The excitement of fever leads to similar results. The inference is supported also by imaginary forms which we often think we see in dim light; by the shadows of objects, and by their reflection in water. In all these cases, what appear to us to be material beings are found in fact to have no objective existence. This constant experience, according to Mr. Tylor, has produced in the minds of savages generally a belief in the double nature of all visible things; in a material body which can be touched, and in an immaterial body which cannot be touched.

From this settled conviction, originating in the lowest tribes and handed down to other races, Mr. Tylor supposes the belief in spiritual beings to have been derived. It is, I think, the only attempt that has been made to give a reasonable account of the universality of this belief on purely physical grounds. It is extremely interesting in itself, and

it has at first sight a very plausible appearance, but it will not bear close examination.

You will see at once that the savage origin of mankind must be assumed before the reasoning can have any force whatever. But in fact it has no force even on that assumption. If savages believe in spirits because they cannot otherwise account for dreams and optical illusions, it is certain that cultured races do nothing of the kind. It is soon perceived that shadows and reflections have no separate existence, and that the general phenomena of dreams are like those of fancy and of memory. If in special cases communication with spiritual beings is ever believed to occur in sleep, among ourselves, it is because we already believe that there are such beings who might thus address us; not because the evidence of this is furnished by our dreams. This is not a case of a belief received traditionally and accepted carelessly, without considering the grounds on which it rests. The validity of its evidence has occupied the profoundest thought of the greatest thinkers for an unknown length of time, and the reasons suggested by Mr. Tylor have had no influence upon minds like these. It is in moral and intellectual evidence, not in the evidence of the senses, that the great leaders of cultivated thought in all ages have found the proof of spiritual existence; and there is no reason in the world to think that the effect of this evidence upon the minds of the higher races has anything to do with the conclusions drawn by savages from facts of a totally different kind.

In all departments of thought different men support the same beliefs, both true and false, by different and independent reasonings, and it is remarkable how often that which could never be really anything more than confirmatory evidence in favour of an opinion is mistaken for the actual source of it. What, for example, can be more striking than the difference

among the reasons given for general obedience to human governments. All races, savage or civilised, in which governments exist, are agreed as to the obligation; but some found it on the divine right of kings, some on the natural rights of majorities, some on the precepts of religious teachers, some on vague superstitious fears, some on notions of inherited rank, some on general expediency. The last of these is doubtless the effective reason in all cases. The practical advantage of having a government and of submitting to it is universally felt; and the other reasons are really only reasons for submission to particular forms of it, the necessity for some form or other being taken for granted.

It is precisely so with the belief in spiritual existence. Certain mental facts, of which all men are conscious, produce in most men the belief that soul and body are different things, and the various arguments which in different states of culture are brought forward in support of this, are only the grounds on which particular conceptions of the fact, and not our assurance of the fact itself, are founded.

And since it is certain that civilised races hold their belief in spiritual existence for reasons which are not those suggested by Mr. Tylor as the cause of savage opinion on the subject, it is impossible to prove and unreasonable to imagine that savage opinion has really been formed in this way.

Without discussing here the question of a real savage origin for the human race, I must point out how vast an error is committed when it is supposed, even as a possible truth, that the existing savage races can have remained isolated and unaffected by the ideas of civilised men from what are called primeval times. The tacit assumption that this has been or may be the case is, I think, the most serious fallacy in the whole modern theory on this subject.

For consider the ascertained facts. We know that powerful and civilised nations existed four thousand years ago; that for at least that length of time the great bulk of the world's population has been under the influence of such thought as is expressed in the ancient literature of Egypt, Assyria, Judea, Persia, India, and China; that war, commerce and adventure have been hurrying men to and fro upon the earth during the whole of that long period. What part of the world can we suppose to have remained altogether unvisited by either the armies, the emigrants, the merchants, or the travellers of its civilised states? We mistake the absence of remembered intercourse and present knowledge for evidence of a permanent isolation, which is quite impossible in a world full of living and restless beings. Every nation has next door neighbours who receive some influence from it, and convey this again to those beyond. Every nation has individual stragglers who pass in all directions beyond its boundaries and never return. Even in the ocean, in the course of many centuries, all islands are visited by strangers either through accident or design. Actual proof of these facts, though really needless, is abundant everywhere. Stone implements are frequently found, made of materials that must have come from a distance. Metal work gives evidence of the same kind. Special resemblances in the arts of life; the wide diffusion of languages and races; the frequent legends concerning the advent of strangers; all show us, as might be expected beforehand, that on this earth, where there are only fifty million square miles of dry land, and a thousand million human beings to live upon it, an interchange of thought goes on perpetually and reaches to every part. This is so simple a question of common sense, that it seems only necessary to state it in plain words in order to command assent. Yet it has been entirely overlooked, though it strikes at the root of the whole evolution

theory as applied to the development of human thought. For it is clear that the knowledge and the arts of savage life tell us nothing about an earlier condition of human nature, unless they have been really self-developed, and have not been suggested by intercourse with higher races. But we can never know this to be the fact unless we know that higher races cannot have had any influence over them, and this, instead of being probable in any case, is manifestly impossible in almost all. A single straggler from a higher race into the midst of a lower one is certain to introduce a whole set of new ideas, and forty centuries are more than sufficient to convey this influence to the ends of the earth. Mr. Tylor is so fully aware of the rapidity with which savage ideas are modified by any intercourse with civilised men, that he very properly rejects as doubtful examples of purely savage thought the legends of a later date than the period when such intercourse is known to have been established. But he falls into the common error of supposing an absolute isolation to have existed previously.

The fact that a belief in two kinds of existence is almost universal among mankind, in all shapes of culture, still remains, therefore, to be accounted for. But that there should be any difficulty in accounting for it arises, I think, from a cardinal defect in that doctrine of Experience on which the materialistic philosophy supposes itself to stand.

That doctrine appears to take the following form. Experience includes all our successive states of consciousness, or at least all that can be remembered. Every state of consciousness depends on changes in the condition of our material organism. Those changes are brought about by contact with the material universe, through the organs of sense, external or internal. The changes themselves, therefore, are only such as one material thing can produce in another. Knowledge, being one form of consciousness,

depends on these very changes, and cannot therefore relate to anything that is not material. When we speak of immaterial existence, therefore, we speak of something about which nothing can be known, because there is no avenue of sense by which it can affect us.

The defect of this view, and of the materialistic doctrine generally, is that it confounds the physical conditions of experience with experience itself, which is nothing but mental change; and that it tacitly assumes, in defiance of the evidence, that consciousness depends on nothing but physical change.

Now this could only be proved by showing that consciousness *consists* of nothing else but physical change, and the fallacy discloses itself the moment we use these words. For if our words have any meaning, physical change and consciousness are the names of two different things, not of one and the same thing. It is not possible for us to understand by any physical state or motion what we understand by consciousness. If I see an object, certain molecules vibrate in my brain. If they do not vibrate, I do not see; but the vibration and the seeing are not only not the same thing, they are totally dissimilar, and are quite as incomparable as a colour is with a number, or a clock with the hour of the day.

This is admitted as a fact, but is very imperfectly apprehended. Professor Tyndall, for example, adopts the misleading statement that, when we see, what we are really conscious of is an affection of our own retina.* An affection of the retina is one of the external conditions of sight, but we are no more conscious of it than of the ethereal movements by which it is affected, or of their remotest physical causes. Consciousness knows nothing about a retina, or

* Tyndall, Belfast Address, 1874, p. 29.

any of its changes. Our own bodies are as much external objects to ourselves as any other material things; and this is especially and unreservedly true concerning the brain and the nervous system, the very existence of which is only known to most of us through a series of inferences drawn from other men's observation.

The absolute difference between a conscious state and a physical condition is felt where its consequences are not acknowledged; and we generally find consciousness spoken of, not as physical change itself, but as the product of it.

But, then, what is a product? Unless it is a new creation it is something which in fact existed before, but is now in an altered state. If we say that consciousness is a product of physical change alone, we can only mean that the physical substance which has undergone a change has at the same time become conscious. What, then, is our notion of consciousness as a condition or quality of a physical substance, and by which of our senses do we apprehend it as such? If I say a thing is hard, I appeal to the sense of touch; if red, to the eye; if sweet, to the palate; if noisy, to the ear; if fragrant, to the nose; if heavy, to the muscles or the nerves. These are all avenues of sense by which I believe that external things affect me. From the mode in which I am thus affected, I infer the existence and the qualities of those external things, and I call them material objects. But when I say of anything that it is conscious, what sense am I appealing to? In what way does it affect me by being conscious? Clearly, in no way whatever. I have no avenue of sense by which the fact can be made known to me as the facts concerning material objects are made known. Your bodily forms and movements affect me as I address you, and make your bodily presence known; but how can I know your

thoughts by any such means? or how can I conceive it possible so to know them? All my knowledge of physical facts comes to me through my physical senses, but none of my knowledge of mental facts is attained in that way. I do not know what they are by inference from my sensations; I know it by direct knowledge of myself as a mental being alone.

The mistaken idea, that what can be verified by the physical senses is worth attending to, but that what cannot be thus verified can never be known, requires a few more words of examination.

Absolute unconditional knowledge is only possible concerning our inward selves. We are conscious, and we know the facts of our own present consciousness; and this knowledge is absolute. To be conscious, and to know the facts of consciousness, are not identical states, but they are both states the existence of which we are always able to affirm unconditionally.

Some of the facts of consciousness, which we call the impressions of the senses, make us infer the existence of material things. This inference we also call knowledge, but it is never absolute or unconditional; it is knowledge of another kind. We cannot affirm that a material object exists and affects our consciousness, in the way in which we affirm that we exist and are conscious.

But the absolute knowledge we have of ourselves extends to nothing beyond ourselves, and is therefore of very limited interest to us as living beings. To know our own states of consciousness is not to satisfy our natural desires, which turn continually from the feelings we experience to the inferences we draw, and find their proper exercise and pleasure in doing so. The inferences drawn directly from our sensations constitute the most perfect kind of knowledge we are

able to acquire concerning things external to ourselves. Experience assures us that within certain limits such inferences may be relied upon, that expectations raised by them will be fulfilled, that wishes guided by them will be gratified, that our confidence in their general truth is never shaken, and that the more carefully we examine them the more correct our conception of external facts appears to be. These inferences thus form the largest portion of human knowledge, and especially of scientific knowledge, in which the desire for exact conclusions, which can be verified again and again without difficulty, finds the fullest satisfaction.

Now the reason why an inquiry into anything beyond these direct inferences from what is called the evidence of the senses is discouraged by scientific men in the present day, is supposed to be because no real evidence exists by which such an inquiry can be answered. The truth, however, is that the evidence is the same as that on which modern science itself relies, but that the conclusion has to be arrived at by a double inference instead of a single one. It is, in consequence, far more difficult, and far more liable to mistake, and it requires corresponding diligence, patience, and caution.

In considering the growth of a tree, for example, we have first to infer the physical facts from our own sensations of sight and touch, and then, from this first inference, to draw a second, as to those causes of growth which cannot be inferred directly from our sensations.

But the basis of all other knowledge is the knowledge of ourselves as beings who can think and feel. This is not the knowledge of any physical fact, all that we know of physical facts being inference founded on it.

Now when something is known to us which cannot be intelligibly accounted for by the elements supposed to be present, the natural and the strictly scientific inference

is that some other element is also there. A new line in the spectrum suggests the existence of a new material. The radiation of light and heat through an apparent vacuum determines our belief in an all-pervading ether. The movements of a magnetic needle convince us that the needle is controlled by other sources of energy. The facts of gravitation between bodies at a distance satisfy men of all schools that something besides the gravitating bodies is concerned in them.

Nor is there much disposition to assume that matter itself is only of one kind. The difficulty of supposing all the known elements to consist of precisely similar atoms, differing only in their grouping, is very great. Nor can any reason be given why only one kind of thing should be in existence, or why there should not be mutual relations between different kinds. When, therefore, we see the facts of life associated with certain material arrangements which cannot in themselves account for them, we ought, as sound philosophers, to conclude at once that there is something here besides these material arrangements.

A serious error of conception on one particular point has much to do with the prevailing materialism of scientific thinkers. We are asked whether, when we speak of "living powers," or "ourselves," we can form a mental picture of any one of these apart from the organism through which it is supposed to act.* The question inverts the whole mental process. It is not from a consciousness of the organism that we infer the existence of ourselves and our living powers; it is from a knowledge of ourselves as existing, and of our powers as living, that we infer the existence of the organism. How do I know that this hand, this head, or this brain are actual realities? I know it only inferen-

* Tyndall, Belfast Address, 1874, p. 13.

tially, and only because I first know, not inferentially but absolutely, the fact that I myself exist, not as a material organism, but as a conscious being. The mental picture I form of myself is of a being using its living powers; and as my conception of the external world, and, of course, of every organism, is all derived from my knowledge of what happens to myself when those living powers are used, the mental picture of myself necessarily includes my relations to outward things as I conceive them, and the outward things themselves are necessarily thought of when I form the picture.

But mental existence, not physical existence, is the one thing absolutely known to us, and though this absolute knowledge of it is limited to ourselves, it enables us to draw inferences concerning the existence of other immaterial beings as valid in their nature as any inference about physical things. All we have to remember is, that any facts concerning other immaterial beings can only be known to us through a double inference, so far as things external to ourselves only affect us through our physical senses. What is possible in mental existence we may know from our own self-knowledge, but what is really the fact beyond ourselves can only be learned by patient observation and the judgment of reason upon its results.

And here I think we may take a final and conclusive step in this important argument.

When a man addresses a single word to a fellow-creature, believing that it will be understood, he virtually abandons the materialistic doctrine, and admits that he himself possesses knowledge which the physical senses can never give. He assumes that his neighbour thinks and feels; but on what ground does he assume this? That a material object of this particular shape is there; that it moves, and speaks, and feeds; that certain acts of his own and certain

conditions in surrounding things are followed by certain changes in this object, including all the sensible phenomena of what we call human life in others; all this is conveyed to him by his physical senses. But they tell him nothing at all about thought and feeling in the object before him; and in assuming that these exist, he cuts off the very root of the materialistic philosophy, for he takes for granted that he knows something concerning objects external to himself, which it is not and could not be possible under any circumstances to verify by any appeal to physical experience.

The thoughts of his neighbours, if they have any thoughts, cannot possibly be made evident to himself in any single case whatever, and the canon of Materialism demands that under such circumstances he should have no opinion as to their existence, and should content himself with observing and recording the laws by which the outward actions of the human forms about him are governed, without pretending to know anything as to their unseen causes.

Yet we are all aware that there is no fact external to ourselves of which we have a more absolute assurance than the fact that our fellow-men do think and feel. What can the materialist say to this? He knows their forms and movements through his own favourite means; he learns them directly through the evidence of his physical senses. He sees their faces with his eyes; hears their voices with his ears; touches them with his fingers; knows that they offer resistance to his muscular sense. But his senses tell him no more about their thoughts than they do about the cause of gravitation.

If he should say he believes his neighbours have minds like his own, because he knows they have bodies like his own, I shall tell him he deceives himself. The bodily form does not give him this belief if the acts are idiotic; and he

would attribute a human intelligence to any form whatever if it gave practical evidence of human motives and purposes. I should tell him also that the co-existence of his own mind with his own body is not known to him as a necessary co-existence. He cannot learn from experience whether his mind could exist without his body, or whether similar bodies must always have similar minds.

And lastly, since experience in any case can never be conceived of as verifying the fact of thought and feeling in his neighbours, but only as verifying other facts from which this is inferred, the inference according to his principles can be nothing better than a working hypothesis, useful only so far as it enables him to predict results.

And yet in what respect does this hypothesis differ from the actual knowledge of material things, supposed to be derived directly from experience itself? That knowledge rests entirely on a similar hypothesis. It rests on our belief in the trustworthiness of memory, which is what we refer to when we speak of experience, and which is verified only as we verify our belief in the intelligence of other men; by the judgment of a living soul.

The conception of memory by the modern physical school is so important, and I think so irrational, that having here referred to it in this way I shall ask you to consider the matter parenthetically for a few moments.

Every sensation or other mental change is supposed by this school to be dependent on molecular alteration of nervous matter. This matter is conceived of as composed of an almost infinite number of connected threads, each of which is a channel of sensibility. To feel anything is to have one of these channels altered. This alteration is either permanent or not. If it is permanent, the feeling may be recalled in memory by again stimulating the same nervous channel.

Now on physical grounds the whole theory appears irrational. Firstly, because all organic substance is constantly changing, so that there is nothing permanent about it. Secondly, because to admit the idea of permanent change is to deny that memory consists in a repetition of what occurred before in the nervous substance, for this could only happen if the substance remained as before. If a stimulus passing through A, B, C, changes it into A, C, B, another stimulus through A, C, B will not be a repetition of the first through A, B, C. Yet if there is no permanent change, what is the physical fact of memory?

Still more important is it to consider that memory does not consist in the reproduction of former mental states, but in the recognition of the fact that they are thus reproduced; that the thing now thought of has been thought of before. And this is a totally different affair. Sights, sounds, thoughts, and feelings are really repeated day by day in our consciousness without the slightest memory attending the repetition. Memory depends on our perception of Time; on our conscious knowledge of a past existence; and to attempt to explain it by any physical conditions, which necessarily represent the present only, is a symptom of a false philosophy, and a science which forgets its own foundations.

Happily our practice is often wiser than our theories, and there is no reason to fear that we shall ever doubt the mental existence of our friends. And, till we doubt it, a permanent materialism is impossible. For if one thing can be known to us which is beyond the reach of sensible experience, other things of a like nature may also be known; and if we can justly infer the presence of a living soul in a human body, we may with equal reason infer the presence of a Divine Spirit in the universe.

There is one particular idea, commonly connected with

the conception of mental or spiritual beings, as distinct from material beings, which has been, I believe, a very serious impediment to sound views upon the subject. It is taken for granted that a human soul, if it has a separate existence, must also have a conscious existence independently of a human body. If you examine the argument used by Professor Tyndall, in his Belfast address, in opposition to Butler's reasoning, you will find that all its force depends upon this assumption.* The reply put into Bishop Butler's mouth is based on the same conception, as I dare say it would have been by Butler himself. But it is in consequence an insufficient and unsatisfactory reply. The true answer would be that a human soul does not require a body in order to exist, but does require a body in order to be conscious. We have no more ground for thinking that our souls could feel as they do without the help of an organised body, than we have for thinking that our bodies could act as they do without the guidance of a living soul. The facts concerning automatic action, so finely brought forward by Professor Huxley, do not affect this question.† If a frog's body accommodates itself to certain circumstances after its brain is removed, and if we really know, which however is extremely doubtful, that no conscious volition is concerned in it, the fact only furnishes one more example of involuntary action which is like voluntary action. The cases are very numerous. Nay, it is probable that everything we do of a physical kind may be done involuntarily at certain times; and habits which we are perfectly aware have been formed by the action of our own will, appear often to be like the winding up of machinery, which, being thus wound up, will carry out our purposes for a given period whether we know it or not. Habits of self-

* Tyndall, Belfast Address, 1874, p. 14.

† Belfast Lecture, 1874.

preservation are expressly of this kind. We are quite ignorant of the nature of the machinery, and are likely to be so till we discover why or how it is that bodily movements take place at all. But that our own will has a distinct relation to them, and that we understand enough of this to determine whether other men have wills and are using them, by observing their bodily movements, will, I suppose, be admitted; though we may be mistaken with regard to any one of them, if we form our opinion on too narrow a basis of observation.

The effect of bodily disease upon the mind and character is great, but all it amounts to is the well-known fact that all our conscious states are influenced by physical conditions. It does not affect the question of our own permanent identity, which does not even depend on our own recognition of it. We forget our existence every night, and our characters, by which we mean the relative force of many inclinations, vary more or less every day. But we do not cease to be the same individuals on this account.

The direct power of a human mind over the movements of matter is undoubtedly extremely small in amount, and is confined within very narrow limits of possible action. And no portion of matter is under mental control to the exclusion of other forces, so that all the movements of which it is capable may be produced by other means as well. Thus, after an ordinary involuntary inspiration, I can, by the exercise of my will, draw in more breath, which would not have been drawn involuntarily. My will in this case has caused a sort of movement which is usually caused by other means. And going to the bottom of this movement, as far as we are able, it seems probable at present that the only material substance over which any one human mind has direct control is the nervous organism of one human body.

And in exercising this control we are not ourselves aware of the substance on which we are acting. We are only aware that by some means our will is obeyed. In this respect we are not unlike the clerks in a telegraph office, who know by experience that if they do certain acts themselves a distant hand will move, though they have no real knowledge of the agency by which this is effected.

But however small the mental power over material movement may be, it is quite sufficient for its purpose. We are surrounded by infinite forces, acting or ready to act in all directions, and all we need is ability to guide a certain number of them to a certain extent. The mind, acting as a cause of change in the nervous system, is, to refer to a familiar illustration, precisely like the driver of a locomotive, who is only able himself to move the steam valve and the break lever, and who can only move even these through a very small space — a space which may be indefinitely reduced by perfect mechanical arrangements till the actual movement and the actual force employed may be inappreciable to sense. Yet this is quite sufficient. There is physical force enough in the steam and in the friction. He does not want to add anything to it; he supplies nothing out of his own strength to the forces by which the wheels are moved or stopped. He only wants to determine the direction in which those forces act, for by determining their direction he controls their effect. And those delicate movements which his own strength does bring about may also be brought about by other causes, the difference being, however, that the whole combination and series of effects which really distinguish the action of human intelligence will not be produced without it.

This seems to me the common sense explanation of voluntary activity. We may discover hereafter that even the

nervous organism is only indirectly affected by the mind, or that mental power is only able to determine the direction in which static forces can become active ones; or we may learn, on the other hand, that all force is mental, and that either small forces are partial manifestations of great ones, or that great forces are the accumulated result of small ones. These are questions of method only.

That defective psychology, which has not distinguished between the fact of spiritual existence and the power of mental consciousness, has had its origin in unscientific times, and has led to much extravagance of thought. We owe to it, for example, the notion that in sleep we are always dreaming, and that nothing once known to us can be really forgotten. Such views are only examples of the kind of thought which makes the physicist so impatient of the metaphysician, and gives Materialism an undue advantage in many discussions. They are obviously based on fancy only, and not on knowledge of any kind.

But we do know that mental existence and consciousness are not the same things as material existence and motion; and as they are not the same things, we are justified in concluding that the universe contains at least two different kinds of being, and that we, as human creatures, are made of these two kinds united. We know our bodies as a succession of moving particles, which come and go, and are never at any moment what they were the moment before. We know our living selves as permanent beings, not coming and going; changing in power and in knowledge, but remaining in identity the same from day to day. Our bodies give us knowledge of the world without, and all the consciousness we can remember is dependent on their assistance. Continually while we live, and finally when we die, these bodies go entirely to pieces, and are used up again and again

in other forms; but our mental nature being different, there are no grounds for thinking that it is either broken up or changed by death; and since it has already inhabited a body continually changing, there is no reason why some other body may not be its dwelling hereafter, giving it again the means of consciousness, and of outward communication with the universe.

Such a view accounts for all the facts known to us, in accordance with our entire experience, which Materialism can never do; and it leaves before us the prospect of a conscious life to come, as in its nature probable on strictly scientific grounds.

That science should recognise this, and teach it, appears to me absolutely essential to its own continued hold upon human interest; for consider again, What are the real consequences of the opposite view? Suppose we were agreed that only one kind of thing has real and permanent existence, and that this one kind of thing is matter. It follows, from the nature of organisation, that no organised being is a permanent being, any more than the water in a running stream to-day is the water that was there yesterday. The water may appear to be the same to others, but it could not appear so to itself if it were a sentient thing. No one will deny that one material atom cannot transfer its own identity to another, or that two different atoms, doing similar things, can never be one atom doing the same thing twice; or that, when we speak of ourselves as continuing to exist, we are not speaking of other beings; or that the question in which we feel a personal interest is, whether we ourselves shall continue to exist, and not whether other people exactly like us will exist after us. The very word "identity" would otherwise be without a meaning, and all knowledge would be illusion. And it follows that, on the theory of Materialism, to continue or to restore the lives of

human beings after their bodies have been dissolved and used again, is impossible. This world then, and the short period of our present lives, could alone be of any real concern to us; and I ask, What are the reasons by which scientific studies, and the general culture of the intellect, are in such a case to be recommended to our choice? If we choose them by nature, in preference to anything else, well and good; but if our natural choice is for other things, what is to induce us to alter it?

A man knows by the tables of mortality what his average chance of life in this world amounts to. He knows that, although he may happen to exceed the average, he may also happen to be one of those who die to-morrow. We cannot help looking before and after. We find ourselves, when we begin to think for ourselves, with tastes and dispositions already formed. We cannot act at all without a motive, and all our motives are either present impulse or reasonable purpose. What reasonable purpose can be set before our minds to make us undertake the slow labours of study, the hardships of self-sacrifice, the risk of losing all by dying while nothing is accomplished?

The question, you must remember, is not whether we should do these things if it happens that we wish to do them, but whether other wishes should be changed to these, and what is to change them. For this is the educational problem of every age. The natural desire of most men, if left to themselves, is to lead easy lives, and to enjoy present pleasures. This desire is disturbed by thoughts of a future life, or of a Divine Presence; but if these thoughts can be discarded, still more if their whole foundation can be disbelieved, what is there in the ordinary course of life to bring about a similar disturbance? Self-interest could never do it with the majority of men. The gifts and opportunities of the majority are comparatively very small, and if

the object is to make this life, while it lasts, a pleasant one, their safest way is to take things easily, and make sure of the pleasure that lies nearest. A selfish Epicureanism becomes at once the highest wisdom.

And the reasonableness of an unselfish life on such a theory cannot be successfully maintained.

No doubt there is in every human being a power of loving and desiring, for its own sake only, whatever is pure and noble and disinterested. No doubt there are many in whom this power asserts itself so strongly that it must be exercised; who of their own free choice prefer the happiness of others, and the moral elevation of their own characters, to anything else that is set before them. No doubt, also, the voice of conscience is universally heard, and is always impelling us in the same direction. But why are we to encourage these feelings when they are not naturally strong? Why are we to say to the men of lower tastes and habits, You are degrading your nature; you are wasting your opportunities; you are sinning against right and duty; if our nature, our opportunities, our conscience, are all the mayflies of an hour, and our own concern in them will end for ever when the hour is past? It is not true that the pleasure of this life is known to be increased by cultivating either the heart or the intellect. Its nature is known to be changed by such cultivation, and those who have experienced this change can no longer content themselves without it. But prior to such experience, most men can very easily content themselves without it; and who is to measure degrees of satisfaction, or show the actual balance between pleasures of different kinds? There are many savage tribes in whom the enjoyment of life is far more unmixed than ours, and what are the reasons by which Materialism would induce us to disturb their present state, and raise them, as we esteem it, into civilised beings? To store the mind with knowledge,

to quicken and purify the affections
this world can never satisfy. It is
flower in an English garden, where w
before it has time to blossom. It is lil
the sun, certain as we are that the earth w

And I must for a moment call your sp
the fact that the physical theories in which M
its chief support are really speculations of the
kind, resting on the narrowest possible basis o
truths.

What Mr. Darwin has discovered, for example, is that, the present world, filled with life as we find it, the process of natural selection will account for continued change in the specific characters of living things.

What we know about evolution generally is that, within the limits of our observation, there is, in the common order of change, a very frequent resemblance to the process which we call development in the growth of living things.

What we know about the dissipation of heat is, that bodies like the earth and sun are cooling, unless there is some external source, not at present understood, from which internal heat can be supplied.

These are most important additions to human knowledge, but they are utterly insufficient to justify the theories now derived from them concerning the origin of life and the history of the universe; and science, in the meantime, while adopting these theories with dogmatic faith, is hiding, under the name of Energy, its own inability to account for the facts relating to the material world, without the help of that which is immaterial. For energy, like consciousness, is not cognisable outside ourselves by any physical sense. We know what we mean by it, but that is because we ourselves possess it, and can infer its external presence by reason of this internal knowledge.

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belief in two kinds of being has been
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rmed under its influence; and that in
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.ioms which have been thus produced, and for
.ere is at least no other obvious justification. If
.undamental belief is overturned, all its consequences go
.h it, and it rests with the lovers of science to show by some new method of their own why study of any kind is worth pursuing. And before replying to this challenge it is necessary to consider another and not a smaller difficulty. If there is really no such thing as immortality, and if the study of science destroys the belief in it, it leads us then to sacrifice a glorious and beneficent illusion for the sake of a painful and depressing truth. Why should we make this sacrifice? Why is it well for us in such a case to know the truth? I think we may be sure of one thing; that mankind generally would decide that it is not well. Whatever we do, our real knowledge of truth is very limited and most imperfect, and the only ground we have for wishing to know as much of it as possible is the assurance, not only that it cannot be altered, but that it is in harmony with our highest and most permanent desires. This assurance is strongly rooted in all Christian nations, but, I believe, in them alone; and it is clear that it must depend on the general view we take of our position in the universe. Science assumes that natural Truth ought to be loved for its own sake, and forgets that it owes this idea entirely to religious trust; to the conviction that all things are governed by infinite wisdom and absolute goodness, and therefore that to know what is true is to know what is best. This conviction

has become so much a habit of tho
we forget what it rests upon, and
needs no support. Yet who does no
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without bringing any compensation, is only commo
ness to others and common prudence for ourselves.
know by the long experience of the past how fully immortality can be believed in and trusted to, under the ordinary conditions of human knowledge, and how perfectly it is fitted to satisfy and purify the desires of our hearts; and if it were a fact that it could never be enjoyed, our wisest course would be to retain the happiness of that belief, and for this purpose to prevent, if not for ourselves at least for our children, the pursuit of studies which led to its rejection. Thus it is, happily as I think, that Materialism will always defeat itself, by turning men away from any form of science which evidently involves the acceptance of its doctrine. And it is therefore in the supreme interest of science itself that I recommend its present tendencies to your earnest consideration. It is a matter on which the leaders of science should speak their whole minds without hesitation. It will not do to say, as is so generally said, We study the physical world, and leave other matters to other men, unless it is plainly shown that these other matters are not affected by the results of physical research. And when, on the contrary, those results as interpreted by science are seen by every one to have the most direct and momentous bearing upon the deepest interests of human nature, there is a cold and forbidding cruelty in the science that will calmly dig about the foundations of our dearest hopes, will lead us

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stinct, whether particular events had happened or particular words were spoken in ancient times; and decisions arrived at in this way were held to have a higher validity than inferences drawn from the patient observation of existing facts. Against such habits of thought the scientific spirit is necessarily and always absolutely opposed, but they are equally inconsistent with the religious spirit, which desires to know the truth as earnestly as science does, and is even more deeply interested in avoiding the pitfalls of false reasoning. But theology, which, in needless alarm, had closed its gates at first against what seemed to be a host of enemies, is opening them again to the reinforcements of its truest friends; and the present danger is that science will remain outside, in a position of cold antagonism, sacrificing its own best interests to the materialistic idea.

Science in other days has held a noble and sacred office, strengthening and elevating by its discoveries the conviction of a divine presence in the universe, and of an immortal future for ourselves; exposing many errors, correcting many prejudices, teaching modesty, tolerance, and patience to our reasoning powers, but maintaining always the essential truth that there are two kinds of Being, and the fact that, while our own mental existence is absolutely known to us, the presence of any bodily organs can only be inferred. If this conception is abandoned, we stand indeed upon one

bright spot of life; but there is an abyss of endless darkness into which, within a few short years, every one of us must take his final plunge. The universe becomes dreadful in the presence of that yawning gulph, and he is wisest who sees the least of it, and who can hide the future in a golden haze of present pleasure till the moment when he drops away. Not such, however, is the true teaching of science in a world like this. It is the closing of our eyes, not the keenness of our vision, that brings such phantoms into view; and the first fresh flower, the first sparkling dew-drop, the first smile of a friend or a little child will take us back to the grand realities of nature, if we look at them in the light of a sound philosophy, and see them as they really are.