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805TH ORDINARY GENERAL MEETING.

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, FEBRUARY 8TH, 1937, AT 4.30 P.M.

W. N. DELEVINGNE, ESQ., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the HON. SECRETARY announced the election of Miss A. G. Jacob as an Associate.

The CHAIRMAN then called on Mr. G. H. Langley, I.E.S. (ret.), to read his paper entitled "The Relation of Change to the Eternal."

CHANGE AND THE ETERNAL.

By G. H. LANGLEY, ESQ., I.E.S. (ret.),
late Vice-Chancellor of the Dacca University.

MANY of the leading thinkers and schools of thinkers who have contributed most to the formation of men's views of the universe in modern times have emphasised the reality of change and becoming. In describing what appears to them the fundamental character of the universe, they have found such concepts as "evolution" and "duration" most applicable. The tendency is intelligible, for it is the result of the advance of science and of the growing social and political consciousness of the people, both of which increase men's interest in the actual world and in human experience. On the other hand, many of the greatest thinkers both in the East and in the West, and especially deeply religious minds, have been led to the conclusion that what is ultimately Real is eternal. Many of them hold that progress in the apprehension of Reality is largely a process of lifting the mind from the experience and contemplation of the *temporal* to the *eternal*. In what follows I propose to discuss the problem of the relation between *change* and the *eternal* which arises out of these two tendencies in thinking. The method of inquiry will be empirical and I shall endeavour to indicate the relation as it is present in each grade of existing

entities and organisms, beginning with the most simple constituents of the physical world known to men of science.

I.

First then let us ask what the elementary constituents of matter signify in regard to the relation between the *eternal* and *change*? I do not intend to speculate on the precise nature of ultimate physical entities, nor am I competent to do so. It will suffice to draw attention to certain features of their characters and mutual influences. Not many years since, physicists regarded the ultimate constituents of matter as hard, impenetrable, unchanging particles, which they called atoms; but in recent years they have abandoned such conceptions and tell us that there is nothing fixed and unchanging in the ultimate entities which constitute the physical world. Atoms, which for centuries were regarded as simple, have been disintegrated, and they are now known to be systems of positive and negative electric forces—called protons and electrons—which retain their relations because of mutual influences. Under certain conditions individual atoms are affected by external forces in such manner as to make them release some of their stored up energy and they send it forth in radiation, such as the radiation of light which comes to us from the sun. Radiation travels at enormous speeds, and here also there appears to be an entire absence of fixity. According to present knowledge, the ultimate constituents of the physical world are the protons and electrons, together with certain neutral forces called neutrons, and the radiations which under certain circumstances they emit. What, then, does this knowledge signify in regard to the relations with which we are concerned? Both types of constituent at first sight appear to show that the ultimate character of the physical world is change and becoming, and can no longer be correctly represented as fixity and permanence. This character seems to be much more accurately described by concepts such as force and energy than by any atomic conception of matter. Despite this, however, reflection shows that permanence, which was formerly associated with the atoms, still persists in the laws which govern the changes of their constituents; and that such laws are connected with the forms that characterise these changes. Let me emphasise the importance of what I have described as "forms that characterise the changes" by reference to the atom of hydrogen, which is the simplest known, and

to radiation. We are told that an atom of hydrogen consists of a single proton with its positive charge of electricity known as the nucleus, and a single electron negatively charged revolving round it in a manner similar to that in which the earth revolves round the sun. Now scientists tell us that the electron of any hydrogen atom can revolve in one of many orbits which may be at varying although determinate distances from its nucleus. Further they say that the atom is a reservoir of stored up energy and that the amount of energy it contains depends upon the dimension of the orbit of its electron. A similar fact is true concerning radiation. Here the amount, or more accurately the *quantum*, of energy possessed by any form of radiation is dependent upon its frequency, that is, the number of vibrations per second; and the number of vibrations is dependent upon the length of the waves. The greater the wave-length of any radiation the less the frequency, and therefore the less the energy transmitted; whereas the smaller the wave-length the greater the frequency, and therefore the greater the energy transmitted. Hence the importance of the forms which persist throughout the changes of the simplest constituents of the physical world. Such forms govern the behaviour of these constituents and determine the kind of influence they impart.

A further point in regard to the forms observed in nature is of great importance. It is the fact that the forms which govern the transmission of force or energy are pervasive of the physical universe as a whole. The movements and changes in physical entities in which the forms are manifest take place obviously in particular spaces and particular times, but the forms themselves and the laws which they imply cannot be said to belong to any space or to any time. Natural laws operate wherever and whenever the necessary conditions exist. This truth is impressed upon us very forcibly by the inquiries of modern astro-physics. This science is founded on the assumption that the atoms and molecules in the most remote of the heavenly bodies behave in a manner which is analogous to that in which the atoms and molecules behave when observed by a physicist in his laboratory.* If this were not the case, the astronomer would not be able to interpret the lines on his spectroscope made by the light of

* Sir Arthur Eddington tells us there is an exact analogy between the wave equation of an electron and the equations which explains the action of the remote spiral nebulæ.

distant stars. What, then, is the significance of this fact? The most distant of the heavenly bodies are hundreds of thousands of light years from the earth, and light travels at the rate of 186,000 miles a second. Now the forms and laws to which we have been referring belong to constituents of the universe so minute that even if they were hundreds of times their present size they would still remain invisible with the aid of the most powerful microscope. They interpenetrate a kind of material underworld within the world of sense perception. At the same time they are so universal that they have operated and continue to operate in universes incredible distances from our earth and existing incredible ages before the birth of man.

Let us then endeavour to picture the essential characters of the physical world relevant to this argument. It is a world in which there are no unchanging entities. Its constituents are centres for the transmission of energy and are all forms of motion. Every constituent is spatially and temporally determined and all its changes belong to particular space-times. It is surrounded by innumerable other constituents that are similar to it in regard to these essential features, and is the recipient of direct influences from the constituents in its neighbourhood, besides being indirectly affected by other influences from more distant constituents. Under such influences any constituent may change into a different kind of constituent; it may conserve its form despite movement, or it may even be destroyed. In any case, however, whatever changes take place will be in accordance with law, and the law operating will be related to the form of the constituent in question and will manifest a pervasive power of the universe as a whole. Should we wish to represent from the visible world the movements of these invisible constituents, we can find no better analogy than the great system of the heavenly bodies. Let the earth with the moon revolving about it represent an atom of hydrogen, the electron being held in position by the proton somewhat in the same manner as the earth keeps the moon in its orbit by the force of gravitation. Now the earth is related to the sun and the other bodies of the solar system. They are separated by great distances in space, but they are kept in their various positions by the forces which they mutually exert. Beyond the solar system are the stars, many of them possibly being solar systems like our own. They are at immense distances from us and are themselves separated by immense

distances. Yet they radiate influences to our sun and earth to which changes here are due. The sun and the bodies of its system may be taken to represent the neighbouring constituents to our atom, and the stars others that are more distant; the bits of apparently solid matter we see dissolve before scientific investigation into systems of moving entities separated from each other by intervening spaces but exercising mutual influences. All is change; but the laws of movement and change, for the invisible constituents as for the vast bodies in the heavens, belong to all time and to all space expressing pervasive powers of the universe as a whole.

To sum up, it seems to me clear that the constituents of the physical world are forces or movements, or systems of forces or movements, that are uniquely determined by space-time, and by their mutual influences are ever effecting changes that are so determined. I use the term space-time rather than the separate terms space and time, since the spatial and temporal determinations of any moving object are interdependent; just as the space of an express train which leaves London for the north, say at 10 p.m., will depend upon the time—11 or 11.30 p.m. as the case may be—at which the particular space will be occupied. Despite their perpetual change, however, all these uniquely determined spatio-temporal processes are manifestations of powers which in their operations are pervasive of the immensity of space and of time, and which for this reason belong to no particular space-time. So far I have not used the word eternal in respect to these pervasive powers and forms; but it seems to me that they are of the kind to which we usually attribute this term, and that when we inquire into the ultimate structure of the physical world we have a vision of the *eternal* carrying on its characteristic function of creating, conserving and changing the beings of time.

II.

Having endeavoured to understand the relation between change and the eternal in the ultimate constituents of the physical universe, let us examine the relation as it is manifest in the more complex and higher forms of being. We will next consider the problem as it concerns living organisms. An organism differs from the entities we have been contemplating in that: first, its form is much more complex although, despite its complexity, it

functions as a whole; and secondly, this form embodies a principle of development. As regards complexity, it is clear that the form of an organism is a complex pattern which includes many subordinate forms and groups of forms. All the members of an organism have definite forms; and, within the members, there are other groups or societies of forms such as the living cells. Further, below the living cells are the chemical and physical constituents with their characteristic forms; and within these constituents are the innumerable invisible molecules and atoms which we have been attempting to describe. Thus an organism is an exceedingly complex form including a whole hierarchy of subordinate forms. Nevertheless, despite this well-nigh inexhaustible complexity, the organism functions as a whole and the activities of its innumerable parts are entirely subordinated in the unity of its functioning. In the second place, the form of an organism develops. There is continuity between the embryo, the infant, and the man. It is clear that there is inherent in the form of the rudimentary organism a principle of development whereby it utilises influences which it receives for the evolving of its characteristic unity. The latter is potential in the embryo and is fully revealed only in complete development.

Now what significance has this structure of living organisms for the problem with which we are concerned? There may be those who would tell us that we should not look to living organisms for anything new concerning the powers that pervade the universe as a whole, since life has appeared—comparatively speaking—only recently, and then only in a tiny part of the universe—so tiny, indeed, that it may be regarded as a speck of dust in regions which extend for hundreds of miles. It may be that scientists are right when they tell us that life first appeared on the earth a few million years ago, and that a few million years is a very brief span in the history of the physical universe. Be this, however, as it may, the nature of life is such that it is very significant of the character of the fundamental powers of the universe; and, despite the limitations of its distribution in space and existence in time, it does connect with the forces operating throughout the entire universe. It is obvious that we must think of living organisms as related to their environments in a manner analogous to that in which we conceived ultimate physical entities as belonging to theirs. Living organisms, like these entities, are continually receiving influences from the

environment; such influences coming from physical entities like the sun, the air, the earth, and the innumerable minute entities they contain; as well as from other organisms in the neighbourhood. These influences are used by organisms for the maintenance and development of their forms. Changes in living organisms, like changes in physical entities, are determinate spatio-temporal processes; but, again like physical entities, they embody principles that are not limited in their operation to any space or any time. In so far as these principles are peculiar to living organisms, there is a sense in which they operate only where such organisms exist; but they are truly universal since they always operate wherever and whenever the appropriate conditions are present. Further, they connect with powers pervasive of the entire physical universe: for, as we have already indicated, organisms are able to utilise influences from physical entities for the conservation and development of their forms. Thus living organisms present us with instances of unities or wholes which are, as it were, capable of receiving universal powers pervasive of the physical universe and using them for the fulfilment of ends immanent within themselves.

III.

In what has preceded I have attempted to show that our knowledge of various types of being reveal a relation between pervasive powers of the universe which must be regarded as eternal and changing entities and organisms that are determined by particular space-times. I now wish to draw attention to another most significant fact. When the higher forms of being emerge and become aware of the nature of influences which they receive from entities and organisms, they acquire the power of co-operating with eternal powers pervading the universe by directing the modes of their operation towards ends which they themselves seek. In endeavouring to make this clear, I will again make use of the simplest possible illustration, and will refer to certain observations in regard to the behaviour of young animals by Professor Lloyd Morgan.

Imagine a number of chicks immediately after they have emerged from their shells placed in an enclosure covered with tiny objects—some of which are edible and some not edible. Among such objects may be included pieces of bread, small

stones and distasteful insects. At first the chicks peck indiscriminately at all the small objects, but their reactions to the various kinds of objects will be very diverse. Pieces of bread will be consumed with apparent zest, but tiny stones will be rejected after they have been taken into the mouth, and the small insects will be rejected with obvious disgust. If, however, the chicks are repeatedly placed in similar circumstances, it will not be long before decided changes take place in their characteristic behaviour. They will begin to discriminate at sight between the various small objects presented. Pieces of bread will still be pecked at with apparent zest, but small stones will be rejected at sight unless they are very like pieces of bread, and there will be obvious revulsion at sight from the small insects. What, then, is the significance of the change that has taken place? For it is evident that repetition of the conditions has resulted in a radical change of characteristic behaviour. Before repetition certain visual sensations were followed by instinctive and natural responses, such as the pecking at the small objects taken into the mouth; and the bodily and tactile sensations consequent on this instinctive behaviour were in their turn followed by instinctive and natural responses, such as the consumption or the rejection of the small objects so taken. But after repetition similar visual stimuli lead to responses of a different order, and this change in kind is possible only in virtue of the repetition. The responses to visual stimuli after repetition are such as are appropriate to the corresponding tactile and bodily sensations, but they occur without the intervention of such sensations. A new route has been effected between the initial visual stimuli and the appropriate final responses, which is a more direct approach to ends instinctively sought in that it dispenses with mediation by intermediate bodily sensations. The explanation of this radical change is found in the fact that repetition of visual stimuli and of the natural responses thereto originates what has been described as *foretastes* of the bodily sensations which would result from instinctive responses, before these instinctive responses take place. Such foretastes are a kind of memory, but they differ from memory proper in that they come into operation only in the presence of visual stimuli similar to those from which they originate. The function which these foretastes of bodily sensations performs is analogous to that which is performed by the actual sensations, and thus the appropriate final responses take

place in the absence of the mediating bodily sensations. A further fact is important. These fundamental changes in characteristic behaviour are controlled throughout by the forms of the recipient organisms. The tendency is to repeat responses which are of such a kind that they satisfy some need of the organism, and to eliminate responses which frustrate the satisfaction of such needs.

Let me emphasise the feature of this phenomenon which is most significant for the purpose of this discussion. With the occurrence of this radical change, living organisms are beginning, instinctively and unconsciously, to direct the operations of pervasive powers of nature and to use these for satisfying ends which they seek. This becomes possible because the foretaste of bodily effects is the foretaste of a universal, since these effects are of a kind which must happen under similar circumstances whenever and wherever they may occur. It is, of course, merely a vague feeling of universal significance and does not include any discriminating analysis of content; nevertheless, it refers to that which is universal and not to what is particular. Foretaste is only possible after repetition, and is an instinctive experience of what is later recognised as the working of natural law. Further, it is apparent that by this kind of behaviour the living organism prevents changes within itself resulting from the operation of universal powers which would lead to its dissatisfaction, and fosters the operation within itself of other universal powers which lead to its satisfaction, and possibly also to its development. Thus in small measure, and restricted by the operation of innumerable universal powers present in the environment and entirely beyond its control, the little chick, by determining its reactions to certain temporal entities, decides whether certain non-temporal forces are to operate within itself. Later it may become apparent that the value of a living being is dependent upon the measure in which it is able to co-operate with the Eternal and to participate in the direction of its operations in creating new temporal experience.

IV.

We have seen that the behaviour of various types of determinate and particular spatio-temporal processes manifest the operations of forces that are not limited to any space, but are pervasive

of the whole universe. Further, we have seen the emergence in living organisms of an instinctive awareness of the nature of objects in the environment, which enables such beings to co-operate, as it were, with the pervasive forces of the Universe and to use these for the attainment of ends which they seek. I now wish to maintain that the appearance and perfecting of such powers in living beings culminates in the creation of persons who are not merely subordinated in their behaviour to the great powers of the Universe without them, but are raised to the great position of being permitted to co-operate with these powers in their work of creating events in time. By their co-operation with eternal powers persons are able continually, again under limitations imposed by their environments and it may be in small measure, to increase the richness of their experience and of the experience of other persons by determining the manner in which universal forces shall operate in the situations with which they are confronted. The extent and significance of this great faculty is clearly manifest only in rational beings endowed with the power of appreciating values, and we are therefore led by the inquiry to a consideration of the functions of reason and of appreciation.

What, then, is reason ? It may be described as the power of apprehending those universal characters or forces referred to above which are operating throughout the existing Universe, and of establishing such relations with them that their efficacy can be used for the attainment of appreciated ends. It is important to remember that the interest of persons, or rational beings, in the pervasive forces of nature is primarily practical, for they are concerned with them not merely as abstract laws but as forces producing change. There is, in fact, no sense in which these laws can be said to exist apart from their operations in changing temporal events, any more than there is a sense in which a person can exist apart from his characteristic behaviour. It may be, however, that when I describe the characteristic activity of rational beings as apprehension of forces pervading the universe and the establishing of such relations as ensure that these operate for the fulfilling of ends which they appreciate, many will feel I am stating a merely speculative principle which has little reference to experience. But this is not the case. On the other hand, I am endeavouring to explain a fact of ordinary experience, and will illustrate my meaning by a simple example.

Consider the usual procedure of, say, a municipality which is anxious to improve the health of its people by providing them with a more satisfactory water supply. It is probable that they would requisition the assistance of experts who have studied the relevant problems and therefore possess scientific knowledge of the conditions necessary for obtaining such a supply. Such experts would presumably have insight into the universal laws which operate, and would therefore be able to suggest to municipal councillors measures for effecting the necessary improvement. Now what are the characters of this process which are vital for the purpose of the illustration? Experts suggest and administrators effect certain changes in existing conditions which they can control, and their action throughout is guided by knowledge of certain universal principles operating in these conditions. Further, they make these changes for the purpose of achieving certain ends which they have accepted since these make for the welfare of people under their care. If they succeed, and there is no reason why they should not, it will be because certain universal forces over which they have no control begin to operate through the new conditions they have made in such a way as to result in the fulfilment of ends which they seek. The illustration could have been chosen from any sphere of human activity, for the same principles apply whenever man makes a reasonable endeavour to solve any of his problems.

I have used the term *reason* to describe man's power of apprehending universal principles rather than the term *intelligence*. The latter is commonly applied to the power of analysing precisely observed changes and of making exact statements of the principles involved. Such analysis and precision are in a measure possible in regard to the more ultimate constituents of inanimate nature, but they are not always possible in dealing with the behaviour and relations of higher forms of being. We have seen how a young animal may be guided in its reactions to its environment by crude unanalysed foretastes of the operations of principles that are universal. In like manner man is often guided by what are frequently described as commonsense principles, which are crude and unanalysed *fore-experiences*. He may also be guided by insight into the nature of things that comes from a finely tuned moral and spiritual nature. Such insight is apprehension of the universally pervasive powers of the universe; and it may be not only unanalysed but also un-

analysable by any human powers, since the relations with which it is concerned are more complex than can be analysed by the human mind.

This leads to another point of importance. I have attempted to show that the facts with which we are dealing are facts of ordinary experience. While this is true, I would like to add that they are also deeply significant facts. From their very nature they compel men, at any rate such as are sensitive, to feel their mystic union with powers that belong to all space and to all time. Despite the fact that man's activities are limited to his minute sphere in space-time, and that this is as it were a speck of dust in an immense universe, he is humbly conscious of his relation with universally pervasive eternal forces which create events in time and of the high power with which he has been entrusted of co-operating in their beneficent operations.

Before closing this section, I would like to add a further reference to the appreciation of values. It will be evident from what has been said that the manner in which any human being fulfils his function of co-operating with the operations of universal powers will depend upon the values which he appreciates. Obviously, he will not seek to make that possible which he does not think worth while. It is therefore important not only that man has learned to apprehend but that, with the power of apprehension, he has also acquired the power of appreciation. Now there is one feature of appreciation upon which it is necessary to lay some stress. It is that appreciation leads to ideals, and ideals are the guiding principles of man's life. What, then, are ideals? They are conceptions of ways in which universal forces might operate to create better human experience and a better environment, but in which such forces are not operating at the present time. In appreciating values also, man is interested in these as expressed in experience and not as merely abstract principles. The objects of his appreciation are not justice and kindness in the abstract, but just and kind men and women. So his ideals have regard not to forces that pervade the universe merely as universal, but to these forces as functioning in creating richer and more satisfying forms of experience. Now since ideals must represent types of experience that are not actual, the question may arise as to whether a man is wise in permitting them to regulate his striving. In doing so is he not pursuing what is illusory? I think not, and the question has not so much meaning

as appears. For every man who possesses an ideal is impelled to pursue it. He must follow, although conflicting motives often interfere with his pursuit. But I hold that the ideals which men conceive and which they must take as guides to action are not illusory. It is true that what they represent does not at present exist. It is true, also, that it may never be found to exist in the form in which it is conceived. For, after all, we conceive our ideals dimly, and they are being continually transformed in the course of our pursuit. Nevertheless, ideals emerge from the appreciation of experience, and they make demands as to what experience should be. I am perfectly aware that it is not possible to prove that what should be, exists; but this can be accepted as an article of faith, and I for one accept it. Nor is this kind of procedure abnormal. All scientific inquirers are obliged to assume that nature is uniform and this assumption is a venture of faith. We can have no evidence that nature is entirely uniform and it cannot be proved, but the belief regulates thinking and scientists and others accept it. In like manner we may be convinced of the reality of the ideal. We may believe that the ideal springs from the universe and that the resources of the universe can support it, in the sense that they can bring it to pass. This, I take it, is the demand made by religion, as spiritual experience. For the spiritually minded the ideal exists in God, and he has faith in the possibility of its ultimate attainment not as the fruit of his own effort but as the result of a movement in which God is working through him.

V.

In conclusion, I will endeavour to state briefly the results of this argument and to indicate its significance. I am conscious that it is most hazardous to suggest applications of an argument so general, but I will make the venture.

In the first place it is clear that all knowledge of the eternal or pervasive powers of the universe is derived from acquaintance with temporal (or rather spatio-temporal) experience and events. All space-time experience, rightly understood, is a drama revealing the functioning of the Eternal. Changes in the most simple of physical entities manifest the operations of natural laws, living organisms utilise these operations for the development of their characteristic forms, and conscious beings begin to co-operate

with the operations of eternal powers by creating conditions in which these contribute to the fulfilment of ends which they seek. Such capacity of co-operation increases with the development of reason and the power of appreciation, and persons possessing these powers seek to direct the operations of eternal forces into channels which lead to the attainment of their ideals. It appears to me that both the universal forces and the ideals reside in the Supreme Reality, and that the high calling of man is that he is permitted to co-operate with this Reality in its function of creating richer and more satisfying temporal experience. Should one inquire why the Supreme Reality does not carry on this great function apart from the co-operation of finite persons, I should be unable to give any reply; save to suggest that an order of this kind may be necessary for the creation of the most perfect type of finite spiritual beings.

Secondly, it will appear that this way of viewing the relation between the Eternal and the Temporal is contrary to all those modes of thinking that fail in recognition of what may be described as the *status* of the temporal. Many great thinkers, both in the East and in the West, have held that the eternal and spiritual transcends the temporal in such manner that the only path to attaining the eternal is that which leads to retirement from the temporal. But if, as has been maintained, the function of the Eternal is to create, conserve and enrich the temporal, human beings are likely to attain it by entering upon their high calling of co-operating in this great work of regeneration in time.

Thirdly, the view put forward is incompatible with the theory that there is absolute distinction between the *material* and the *spiritual*. It has been shown that the changes and influences of the simplest known physical constituents reveal the operations of powers pervasive of the whole universe. These changes may be described as physical; but, in view of the fact that universal powers are immanent within them, it appears to me that they are very akin to what is spiritual. And certainly when human beings, by apprehension and appreciation, direct the operation of universal powers towards ends which they conceive as of value, their acts are spiritual. When, for instance, a physician uses knowledge of the human body and of micro-organisms with the purpose of eradicating disease, his acts are spiritual; and such acts are identical in kind with those which make up the experience of ordinary men and women. I am aware that there are

other ends which the spiritually minded seek and of the supreme importance of these ends. They seek the presence of God; yet the God whom they seek is one with Him who is the source of the forces and ideals which men know and appreciate.

Finally, it seems to me that this view of the relation between the Eternal and the Temporal gives reason for confidence and trust. Frequently it appears that the problems with which men are confronted at the present time are so complex and difficult that any resources which they possess are inadequate for their solution. It may therefore be ground for hope to know that in dealing with these problems men have not to depend on their own resources, but that, on the other hand, it is their function to use what knowledge they possess for bringing about conditions in which forces residing in the universe and in God can carry on their work. They will fail in this function unless they are prepared to face fearlessly discomforting facts; for it often happens that, through ignorance and the misdirection of human purpose, powers which might promote man's welfare are working for his destruction. But if men are prepared to confront difficulties with truthfulness and to follow such guidance as is given them, there is no reason for assuming that there is any inadequacy in the eternal resources upon which the solution of their problems must ultimately depend.

Discussion.

The Chairman's remarks: I am sure you will all join with me in thanking our lecturer to-day for his able and interesting paper. The subject is one that lies somewhat off the beaten track of our discussions; but it is refreshing and stimulating to have our thoughts led to the consideration of a subject that belongs to the domain of philosophy.

In the opening paragraph of his paper the lecturer remarks that many of the greatest thinkers have been led to the conclusion that "what is ultimately real is eternal." Does this mean "ultimately real in the physical realm or in the absolute sense"? The lecturer observes that "both types of constituent" (pistons and electrons) "at first sight appear to show that the ultimate character of the physical world is change and becoming," and that "this character

seems to be much more accurately described by concepts such as force and energy than by any atomic conception of matter. He then discusses "the forms that characterize the changes" and observes that the forms which govern the transmission of force or energy are pervasive of the physical universe as a whole. His final conclusion is that the constituents of the physical world are forces or movements, or systems of forces or movements, that are uniquely determined by space-time, and by their mutual influences are ever effecting changes that are so determined; and he argues that, despite their perpetual change, all these uniquely determined spatio-temporal processes are manifestations of powers which in their operations are pervasive of the immensity of space and time, and which for this reason belong to no particular space-time. But this argument, I venture to think, does not, and cannot carry us beyond the limits of space and time. However vast and pervasive the powers may be, it cannot be assumed that they are of infinite and unending duration. Take the solar system, for instance: science tells us it has continued in its present form for thousands of years, but that, nevertheless, it is gradually running down, like a clock, and that in process of time it will cease to function. If that is so, it would be a fundamental error to describe the solar system as "eternal." The lecturer has perceived this difficulty, for at the close of the first section of his paper he makes the following observations: "So far I have not used the word eternal in respect to these pervasive powers and forms; but it seems to me that they are of the kind to which we usually attribute this term, and that when we inquire into the ultimate structure of the physical world, we have a vision of the 'eternal' carrying on its characteristic function of creating, conserving, and changing the beings of time." This, I venture to think, is "begging the question." If we agree to use the word "eternal" in respect of any process or movement to which the mind and knowledge of man can assign no limit, well and good. But that is not the usual acceptation of the word, nor is it the meaning that is attributed to it in the Scriptures. "The Eternal God" is the God Who has neither Beginning nor End; and if the word "eternal" has this meaning assigned to it, we cannot predicate of anything in the physical universe that it is "eternal." We have no grounds, I think, for saying that the

physical laws which govern the universe are eternal, or that the purely physical has in it the germ of the spiritual and eternal.

The lecturer has remarked (p. 7) that " there is, in fact, no sense in which these laws " (*i.e.*, the laws governing movements and operations in the physical universe) " can be said to exist apart from their operations in changing temporal events," and it is clear, therefore, that we cannot argue from the *apparent* permanence of the laws affecting change in the universe around us to its eternal duration.

The chief defect of the paper, I would urge, is that it has ignored the effect of sin in the world around us and the remedy that God has provided for sin. The universe that God made was perfect, but sin came in and brought death in its train, and only by the indwelling of the Holy Spirit can man be delivered from the power of death and made a new creature.

The Revd. ARTHUR W. PAYNE said: I wish to thank the writer of the paper for his thoughtful and suggestive messages on " Change and the Eternal." The last speaker linked the Creator and Redeemer in his discussion of the relation between this topic and the Scriptures. " I am Jehovah, I change not " is such a passage paralleled in the New Testament by the familiar words, " Jesus Christ the same yesterday, and to-day and forever." Such statements, which abound in the Bible, seem to furnish a solution for the problem under examination. They speak of the Incarnation of Eternal Immanuel in time, appearing in time as the everlasting Son of God, our Lord and Saviour.

It is instructive to note that the Jews speak of the everlasting sovereign God as " Adom Olam," and of themselves as the everlasting nation or the eternal in time (Am Olam).

In the Hebrew scriptures, the opening word of Genesis (" In the beginning ") has for its first three letters the initials of the Hebrew words for Son, Spirit, and Father. The New Testament provides the complement in I Cor. xv, 28, where we read that in the end of all things God will be all and in all, as we have just been reminded in the paper.

With regard to the chicks, and their powers of discrimination, it may surely be argued that it is a Divine instinct, implanted within

them, that they should pick up the grains of corn, and reject the dirt. This illustrates in an effective way the discrimination of truth and error.

In reference to incredible distances, one recalled the statement that whenever the hand is raised a shiver is sent to the most distant star.

The mention of immense distances gives occasion for an expression of satisfaction that the writer does not seem to commit himself to the theory, which is so often obtruded on the minds of men in these days, that human history stretches backwards for an incredible space. I personally was sorry to see an exhibit in the South Kensington Museum bearing on this point, and appearing of all places in the Children's Gallery. It represents the development of transport for untold centuries, commencing with primeval and primitive man. The first exhibit was concerned with modes of transport as they existed ten thousand years ago, and the next, the methods in vogue five thousand years ago. It is striking that the differences are not very great. One cannot but regret that the young are misled in this way.

The doctrine of eternal salvation still further illustrates the connection between change and the eternal, inasmuch as the gift of grace received by faith is capable of continuous outworking until we are changed into the Divine image, while it is always God Who worketh in us to will and to do of His good pleasure.

Mr. EVERARD JOSE said: "All space-time experience, rightly understood, is a drama revealing the functioning of the Eternal." This sentence (Section V, p. 79) seems to sum up the whole of this illuminating and inspiring paper, with its good comfort and encouragement and its abundance of practical detail. The New Testament is richly full of the same great subject, agreeing with the evidence from Nature; and it is extraordinary how the clear Scripture light given to us has been passed by and neglected by each of the main schools of thought and types of mind, not only by the Rationalist and Institutional groups but also by Evangelicals.

God has spoken to us in His Son, Whom He hath appointed Heir of all things, through Whom, also, He made the ages. "All things through Him became, and, apart from Him, became not, *one* thing." "Of Him, and through Him, and to Him are all

things." In connection with Mr. Langley's four points, we may notice the Eternal (I) (II) and the changing physical entities, as a commentary on the words of Paul, " All things in Him hold together." Again, the reference in II to pervasive power in a living complex organism throws light on the meaning of such passages as " God has given to everything a body as it has pleased Him " ; or again, " Ye are the body of Christ and members in particular " ; and yet again, " He is the Head of the body, the Church." Passing on to III, it will be found that the discussion of the recognition and use of the pervasive forces illustrates the famous verse, " I can do all things through Christ which strengtheneth me." In the same fashion, passages in IV illuminate the New Testament phrase " Workers together with God."

All the actual laws of the universe are thus of necessity the laws of the Son of God. Both the permanent and fixed laws, as well as those of obligation, set before our free will. That statement includes the laws of physical nature, the laws of human nature, the laws of artifice and those of vision. Think, for instance, of such cases as the laws of number, the laws of mathematics, or the ultimate laws of music. All are the laws of the Son of God. Special attention ought to be paid to the laws of right choice in space-time. " I have set before you (space) this day (time) life and good, and death and evil." When we chose death and evil, and perverted the plan of God for our footsteps and environment, the Eternal came as an entity into space-time. " The Word became flesh and dwelt among us." He was in the world which came into being through Him, and it did not know Him. But to as many as received Him, He gave authority to become children of God. Through the blood of His cross came peace that all things might be reconciled to God, " on earth and in heaven." Soon " in heaven and on earth " was all authority given to the returning Son of God.

What is the culmination of this drama of the functioning of the Eternal in space-time ? " He must reign until He has put all things under His feet." We see not yet all things put under Him, but we see Jesus at the right hand of God, in expectation till His foes are made His footstool. And the end is before us, when He shall have delivered up the Kingdom to the Father, having

put down all rule and authority and power; and the Son Himself shall be subject unto His Father, Who put all things under Him, to the end that God may be "all things in all things."

Written Communication.

Mr. W. E. Leslie wrote: The author discusses "Change" and "the Eternal," but neither of the terms is defined. Are they antithetical? The opposite of change is changeless (motion—motionless).

The popular idea of eternity amounts to this, "That part of the time co-ordinate not lying between the creation and an event set out in the Apokalypse," the part of the co-ordinate between these two points being known as "time." This may be based in part on the rendering of Apok. x, 6 "chronos ouketi estai" as "there shall be time no longer" but the words might be rendered "there shall be *delay* no longer." The theory is wrecked against that majestic phrase in John viii, 58, "Before Abraham *was* I *am*." Here we have a glimpse of an eternal order that is no mere extension of a time co-ordinate.

The author's illustrations of his "pervasive forms" might be simplified. Suppose two consecutive and equal motions of a point on any co-ordinate to be followed by a motion equal to the sum of the two previous motions. Suppose that sequence to be invariable in our experience. Suppose that we feel justified in regarding it as universal. Can we say that, though the particular point-events are all of them in space-time, yet the *form* of the sequence is not? Does this not carry us back to the old debate as to the objectivity of abstractions? I would suggest that they are objective for finite minds—because they exist in the Infinite Mind.

The Rev. Principal H. S. Curr wrote: Like all who heard Dr. Langley's paper, as well as like all who read it, I thoroughly enjoyed his clear and cautious exposition of a subject which is peculiarly appropriate in these days when change is much more in evidence than permanence. The paper's attempt to reconcile these two phases of existence and experience has been most suggestive, all the more so because of the writer's intimate acquaintance with

Indian life and thought, where the approach to these problems is different from that of Occidental philosophy.

Familiarity with the standpoint and spirit of Eastern thinkers may have been responsible for the use of the word " eternal " as a synonym for permanent as opposed to changing or passing. Eternal is an adjective which can only be used of God, and of such men and things as share in the Divine Nature in one way or another. It hardly seems justifiable to speak of the eternity of matter, or the eternity of energy, or even of the eternity of law. If the word be merely the equivalent of the enduring, then the paper leads us again to the contrast which finds classic expression in the New Testament. " And this word, Yet once more, signifieth the removing of those things that are shaken, as of those things that have been made, that those things which are not shaken may remain " (Hebrews xii, 27 R.V.).

In Mr. Langley's treatment of these contrasted factors in the world as it may be known, insufficient stress was laid upon the distinction between knowledge and its object. The latter remains the same more or less, yesterday, to-day, and for a long future, but knowledge of it is a constant state of flux. Thus hydrogen is probably identical now with what it was in the days of Aristotle, but theories regarding its ultimate structure, atomic or electronic, have been changing continually. The fact remains, the theory of its origin and nature, etc., continually changes. That observation even applies to these pervasive forces and factors which the paper seems to identify as " eternal." The law of gravitation might be regarded as such a force or law, but even its statement has been modified in recent years. The events, however, of which Newton's and Einstein's theories are the explanation (*e.g.*, the movements of the stellar bodies) do not alter. Mr. Langley's problem seems to me to be one of epistemology more than of existence.

The antithesis of the passing and the permanent is much more clearly seen in the realms of religion and morality and philosophy than in empirical science. In these departments of man's life, the eternal elements are few and simple. They were early discovered and stated in imperishable form in the great books of the world, headed by the Bible. The statements of these basic principles is usually clothed in the garb of other days, which has long since

been discarded, but the principles themselves remain as valid and as valuable as ever. The stories of Scripture reflect an ancient civilisation which has long since vanished. The knowledge of God, which these stories enshrine, is becoming more precious as universal experience enlarges and deepens. Elizabethan England, whose ways and works shine through Shakespeare's plays on every page, has likewise disappeared, but " the tunes of life " which are scored in these same writings are everywhere and always sounding in our ears.

Author's Reply

Since the remarks made by Members of the Institute on my paper have been forwarded to me, I have learned with very deep sorrow of the death of Mr. Delevingne, whose presence in the Chair at the meeting I so greatly appreciated. Now that he is no longer with us it does not appear to me fitting that I should reply to his friendly criticism, but I should like to express my deep sense of the great loss the Institute has sustained, and my very deep sympathy with Mrs. Delevingne and the members of his family.

Principal Curr, while expressing appreciation of the argument generally, appears to doubt whether the term " eternity " is accurately used, and his doubt seems to have been shared by Mr. Leslie and other members. He thinks that " the influence of Eastern thinkers may have been responsible for the use of the word *eternal* as a synonym for *permanent* as opposed to *changing* or *passing;* whereas *eternal* is an adjective which can only be used of God, and such men and things as share in the Divine Nature in one way or another." For this reason he holds that " it is not justifiable to speak of the eternity of matter, of energy, or of law." These reflections seem to overlook my view of what may be described as the solidarity of the various grades of experience. It is true that, in working out the conception of *eternity*, I had in mind the characteristic ways in which it has been conceived by Eastern thinkers, but I found these inadequate for the reasons suggested in the first and second paragraphs of section V. In writing the paper, it was not my intention to use the term " eternity " as synonymous with " permanent "; nor did I intend to argue that the pervasive characters of material objects and events as such, that is in their

abstraction from what may be described as the higher grades of experience, are eternal. On the other hand, I hold that *as such* they are abstractions, and are therefore in themselves not real; although they reveal certain characters of reality. If pressed for some term to describe the "eternal," I should not use "permanence" or any similar term, but rather "creativeness." For my reflection leads me to conceive the Supreme Reality as ever the same because ever revealing Himself in His acts of creation; and thus as the changelessly-changing source of all becoming, who would himself change if He ceased to be the author of change.

Principal Curr also argues that insufficient stress is laid upon the distinction between knowledge and its object. In the paper I am only concerned with the epistemological problem in so far as it implies apprehension of objective features of experience, and it is to these that the relation refers which I am endeavouring to explain. Further, I agree that the antithesis of the "changing" and the "eternal" is more fully experienced in the realms of morality and religion, and that the statement of these basic principles is "usually clothed in the garb of other days which has long since been discarded." Part of my purpose in the paper was to clothe them in more modern dress.

Mr. Jose and Mr. Payne express agreement with my point of view generally, and it is not therefore necessary for me to comment upon the further reflections they have made; but I thank all those who, whether in writing or in discussion, have expressed their opinions.