

Review Article

CHRISTIAN THEOLOGY AND NATURAL SCIENCE

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The importance of this book* arises from the fact that Dr. Mascall is singularly well qualified to write it. At Cambridge he was a wrangler in the Mathematical Tripos, and gave particular attention to relativity and quantum theory. He has evidently made a scholarly study of modern cosmology, and is familiar with contemporary scientific thought in many fields. He is also one of the most outstanding theologians of the day, and is the author of several well-known books on theological subjects.

The relation of Religion and Science raises intricate and profound problems, which cannot be dealt with adequately on an elementary level. Many expositions fail because of an imperfect understanding either of science or of theology. Although at the present time there is widespread interest in the subject, and although books, pamphlets, and articles upon it are published continually, there are very few discussions which are competent and thorough. This book is both. The theologian will welcome it as throwing a penetrating light on many obscure questions. The scientist will rejoice to find a theologian who can talk his language. Dr. Mascall shows remarkable erudition in both fields, but it is perhaps not unfair to describe him as a theologian who understands science rather than as a scientist who understands theology.

In his general approach Mascall deprecates the tendency to see science and religion as necessarily opposed to one another. 'One does not propose', he says, 'to conceive one's subject in the light of a warfare, a struggle or even a conflict. I am sorry to disappoint anyone who may be looking forward either to a spectacular rout of the devils of science (falsely so called) by the angels of orthodox theology or, on the other hand, to a sensational capitulation of the forces of superstition and reaction to the spirit of enlightenment and progress . . . so far as my own acquaintance with theology and science is concerned, I simply cannot see the question of their relations in that light.' It is rather a question of establishing contact between different approaches to reality: 'There is a large domain of thought in which it is possible for theologians and scientists to engage in intelligent, good-humoured and fruitful conversation.' No doubt he is right. He does not deny, of course, that there have been fierce battles in the past, and that there are very radical differences of outlook at the present time.

Amongst the fundamental questions considered are the nature of scientific theories, the necessity or contingency of the world, the idea of creation, the problem of indeterminacy, the relation of body and soul, and the purpose of creation. The object is to consider these matters in some detail, rather than browse discursively in a wider field. There are full references to sources, and the contributions of outstanding thinkers are discussed at length.

SOME SCIENTIFIC THEORIES

A century ago it was taken as almost self-evident that a scientific statement, hypothesis or theory, was to be interpreted as a straightforward

* *Christian Theology and Natural Science*: by E. L. Mascall. Bampton Lectures, 1956. Orient Longmans, Calcutta. 25s.

literal description of the real world. As such it was either true or false. The present picture is radically different. Relativity theory, while not denying that there is an 'objective' world independent of the observer, showed that events must necessarily present themselves differently to different observers. A may observe as a red circle what B observes as a blue ellipse. Both descriptions are equally 'right', along with an infinity of others, and there is no single unique description of an event or succession of events.

Quantum theory, on the other hand, has introduced us to a world of events on the sub-microscopic scale which are not observable at all in the ordinary sense, and which can only be described with the help of a probability calculus. The concepts used in the theory have only a very indirect connection with observation. It is highly debatable whether such an entity as an electron can be considered to have the same status in experience as ordinary objects such as tables and chairs, and it would be very hard indeed to claim that status for such recondite concepts as Schrödinger's Ψ function.

A physical theory is in fact a free construction of the human mind, designed to exhibit certain properties. If these properties correspond to what we observe in the actual world, the theory is to that extent successful. Halliday, a thorough-going logical positivist, puts it in this way: 'It is the rôle of theory to give, on the basis of a few hypotheses, a simple unified description of as many experiments as possible. The question of the *ultimate truth* of either hypothesis or theory simply does not arise. Theories and hypotheses may be replaced at any time by more useful ones . . . It is commonly held by other philosophies that the universe is a vast reservoir of truths and that it is the function of the scientist to uncover these truths. A logical positivist, however, sees no operational way to decide whether a given theory or hypothesis represents "absolute truth" or not . . . His goal is to give as economical a description as possible of the sense perceptions that come (or that can be made to come) within his experience.'

Mascall fully recognizes these features of scientific theory, and comes to the following conclusion: 'The maps or models which science uses, whether constructed out of physical images or purely mathematical concepts, are no more than deductive systems whose function is to co-ordinate and to predict empirical observations. There is a large margin of arbitrariness as to which theory we adopt in any particular case, and there is no reason to suppose that logical necessity in the structure of a model implies any kind of necessity in the structure of the facts which it depicts.' It may appear remarkable to find a positivist and a Christian theologian putting forward the same view, but the agreement, it must be noted, amounts only to a common recognition of the nature of scientific theory. Mascall vigorously denies that the positivist setting is in any way necessary. He welcomes the decline of 'the superficial literalist view of scientific theories which held the field from the time of Newton almost to the present day' as the removal of a false barrier. If the theologian believes in a real world of meaning and purpose, the scientist can no longer gainsay him on the ground that the real world is that which is described by the scientific theories.

The chapter on contingency is an admirable discussion of a difficult and abstruse subject. The question is, to what extent must the universe necessarily exhibit those features which we observe, or could it conceivably have been otherwise? Eddington maintained that the generalizations which we call the laws of physics could be deduced by theoretical reasoning, without empirical experiments. He gave the famous analogy of the fishing-net with the two-inch mesh. The fisherman observes empirically that all catchable fish are more than two inches long, but the same generalization could have been arrived at *a priori* by inspecting the net. In the same way the system of thought by which we interpret our experience imposes certain generalizations which we may discover empirically, but which should be deducible *a priori*. Eddington developed this point of

view in abstruse mathematical investigations over a series of years, and actually calculated from his theory the numerical values of the fundamental constants of physics.

AN ALTERNATIVE COSMOLOGY

Milne developed an alternative cosmology in which he also sought to show that from a few very general postulates the detailed characteristics of the universe could be derived by pure deduction. The extent to which either Eddington or Milne really achieved this aim is still a matter of controversy. But even if it were achieved, there is the further question whether the fundamental postulates are self-evident, or can be seen to be logically necessary. Mascall comments: 'Only if this latter claim were substantiated would the actual universe be shown to be logically necessary and its apparent contingency be shown to be an illusion. In other words, to prove the necessity of the actual universe two things must be done. Firstly, certain fundamental cosmological principles must be shown to be necessary. Secondly, it must be shown that, given those fundamental cosmological principles, the world that actually exists follows with logical necessity from them.'

All this has an obvious bearing on Christian theology, for which the contingency of the world is a cardinal point. 'The world', says Mascall, 'has a double contingency; first of all a contingency of *existence*, in the sense that God need not have made a world at all, and then a contingency of *nature*, in the sense that, even if God was going to make a world, he need not have made the particular world which he has made.' But if God does create a world 'it will be both contingent and orderly, since it is the work of a God who is both free and rational. It will embody regularities and patterns, since its Creator is rational, but the particular regularities and patterns which it embodies cannot be predicted *a priori*, since he is free; they can only be discovered by examination'.

Surely the last statement goes too far, as Mascall seems to admit at the end of his discussion. While we may not accept all the implications of Eddington's and Milne's cosmologies, their work has made clear that we must expect at least some of the features of the universe to be knowable *a priori*. The mathematician predicts the ratio of the circumference of a circle to its diameter *a priori*, without the formality of measurement, and 'what Eddington and Milne have shown, if their arguments are valid, is simply that regularities and co-ordinations of this kind are more pervasive than had previously been realized'. Mascall concludes: 'If modern cosmologists have been clever enough to discover by general epistemological principles what the detailed nature of a knowable universe must be, we can only be grateful to them. Their success in this endeavour leaves it, however, an entirely open question why such a universe should exist and should be experienced . . . Whether the world has been manufactured by the mind, or the mind manufactured by the world, or both manufactured by God is a question that lies outside the scope of physical science.'

CREATION

'Creation' is a word which has been freely used, in modern scientific writing, to mean two things. Firstly, many lines of evidence lead to the view that the present order of things originated from a super-dense aggregation of matter which exploded. The millions of receding nebulae which we now observe are the debris of this cosmic explosion. The initial event can be approximately dated at an epoch some 6,000 million years ago; it represents the starting point of the universe and has been regarded by some as the original creative act of God. Secondly, there is the hypothesis of Bondi, Gold, and Hoyle, that the universe had no beginning, but that matter not previously present continually makes its appearance at the rate of about one hydrogen atom per cubic mile per hour. This hypothesis is usually given the name of 'continuous creation'.

The use of the word creation in purely scientific discussions is unfortunate, and a more neutral term would have been preferable. The word carries a halo of theological implications. Theologically creation implies the activity of a creator, but in the scientific theory it merely implies that the quantity of matter present at the time t_1 is not the same as the quantity at time t_2 . Mascall is at pains to expound the Christian doctrine of creation as something much deeper than a temporal change in the quantity of matter. 'The act by which God creates the world does not occur *in* time, for time is itself an attribute of that which is created. The difference between the creation of a world which had a beginning and the creation of a world which has always existed is not the difference between an act which began at a certain moment and an act which has always been going on. It is the difference between two acts which are both timeless: the act of creating a world whose temporal measure has a lower boundary and the act of creating a world whose temporal measure has not.'

An adequate review of these problems in a short article is impossible, but Mascall's discussion will repay careful study. The same is true of his treatment of indeterminacy, though when he maintains, as he seems to do, that the undetermined events of atomic physics are caused individually by the free will of God, not many physicists will find the conclusion acceptable. Through the whole book Mascall repeatedly affirms that theology in the last resort is independent of scientific theory. Here are some instances: 'So far as I can see, almost any cosmological theory can be interpreted either religiously or atheistically, according to the general metaphysical position of the interpreter.' 'Mass and energy after all are simply operationally defined quantities like any others; their conservation may be of considerable interest to physicists, but it has no metaphysical significance.' 'The findings of modern science tell us a great deal for which we should be grateful about the nature of the universe that God has made, but we shall be wise if we build our conviction that God has made it upon other foundations than those of modern science.' 'If Einstein's belief that indeterminism is only a passing phase should turn out to be correct, the withers of the Christian theologian will remain unwarped.' While all this is doubtless true in a sense, the point seems to be overstressed. Surely theology is not so completely metaphysical that scientific knowledge has no bearing on it at all.

The concluding chapters will probably carry less conviction than the others to scientific readers. Many, for example, will find it difficult to take seriously an elaborate discussion of the precise moment at which the human foetus becomes animated by a 'soul', a question which is reminiscent of medieval scholasticism. But even here Mascall displays an impressive acquaintance with psychological and biological thought.

The book as a whole is extremely well written, but it is not food for babes, and it demands a considerable intellectual effort. One cannot expect a book on this theme to be particularly easy reading. Sentences such as the following slow down the pace: 'Just as the essence of perception is not sensing objects but apprehending them, even if we can only apprehend them through the mediation of sense, so the paradigm of a real world is not its sensible imaginability but its intelligible apprehensibility.' But this is not typical, and one gladly acknowledges that considering the profundity of the subject-matter, the writing is often distinguished by its clarity and precision.

We may be grateful to Dr. Mascall for these Bampton lectures, which form a most able and stimulating contribution to the literature of Science and Religion.

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Rabbi Jacob said, 'This world is like a vestibule before the world to come: prepare thyself in the vestibule that thou mayest enter into the festival chamber.'

PIRQUE ABOTH