

PHILOSOPHY AND THE PHYSICISTS

PHILOSOPHY AND THE PHYSICISTS, by L. Susan Stebbing
(Methuen, 7/6).

'One of the most unprofitable of all forms of reading' was the verdict some years ago of Mr. J. N. W. Sullivan, whose opinion in this matter should carry some weight, on popular works on science.¹ The task with which Miss Stebbing has saddled herself in her latest book is that of demonstrating, by means of an analysis of the more popular works of Jeans and Eddington, the plain truth of this statement. This is by no means the first occasion upon which such an attempt has been made, though never perhaps has it been made with such thoroughness and upon so large a scale. In *The Scientific Outlook*, otherwise one of his least satisfactory works, Mr. Bertrand Russell made a lively, if not particularly detailed, attack upon the 'idealistic' tendencies of Eddington's excursions into philosophy; Professor Joad's *Philosophical Implications of Modern Science* is perhaps of greater value than professional philosophers have been willing to recognize; and no reader of this periodical is likely to forget the brilliant article by Mr. J. L. Russell, entitled *The Scientific Best Seller* (republished in *Determinations*), compared with which Miss Stebbing's first chapter, where many of the same points are raised, is perhaps a trifle inconclusive. Not that Miss Stebbing's book bears the least trace of hasty compilation; I should describe it as over- rather than under-written. It is simply that the task she has set herself—I used the word 'saddled' just now with deliberation—precludes anything but the briefest reference to personal beliefs and opinions. Admittedly there are places—the Chapter on Free-Will, for example, and the extremely interesting but highly compressed conclusion—where something more in the nature of positive affirmation would have been welcomed. This, however, is not a criticism of the book; it is merely an invitation to the author to write another. Towards the end there are hints, or statements that may be construed as hints, that this is in fact her intention.

¹*But for the Grace of God*, p. 41.

Philosophy and the Physicists, then, is not easy reading ; unlike many of the objects of its attack, it cannot be said to ' read like a novel.' And in spite of the obvious care with which it is written, the quality of the chapters tends to be unequal. In places, the book gives the impression—perhaps as a result of the ' over-writing ' of which I spoke—of having been laid aside at odd intervals, to be taken up again at some later time with recovered zest. Chapter III, for example, entitled ' Furniture of the Earth,' opens with an introduction of perhaps somewhat unnecessary elaboration, whose purpose, it subsequently turns out, is merely to illustrate the manner in which the common reader might ' describe his experiences in the familiar world that he inhabits ' ; both Chapter VII and Chapter X, on the other hand, the one entitled ' The Nineteenth Century Nightmare ' and the other ' Human Freedom and Responsibility,' which give the impression of having been designed to lead up to some fundamental contention, end, like exhausted gramophones, with a sudden diminuendo. What remains impressive about the book, however, is a painstaking attention to detail that reminds one, with due allowances for differences of approach, of Mill's examination of Sir William Hamilton and even of Broad's colossal dossier on McTaggart ; a task to which the author, one of the most acute minds in present-day philosophy, has brought the whole weight of her training and experience in philosophical analysis. Although intended for philosophers and ' that section of the reading public who buy in large quantities and, no doubt, devour with great earnestness the popular books written by scientists for their enlightenment,' the book is unlikely to receive the attention (I should say that the section mentioned above is unlikely to patronize it to the extent that the author thinks) enjoyed by the objects of its attack. That may not turn out to be so very important. What matters is not so much that the general public shall read it, as that they shall be informed that it has been written. There is of course a section of the community, not directly referred to by Miss Stebbing, into whose minds the substance of this work should be forcibly propelled : I refer to the host of Bishops, curates who hope one day to be Bishops, Headmasters who conceive of their function as analogous to that of Bishops, and other ideological demagogues, who are responsible for so much of the prevailing vulgarization of scientific ideas.

This is to be a review, not a digest ; and although one is tempted to cite a number of examples showing the quality of the author's perspicuity, only the most typical can here be mentioned. Miss Stebbing is at her best, perhaps, in pointing out the absurd reputation acquired by Heisenberg's Principle of Uncertainty as a means of bolstering up a jaded religious faith. 'It is odd,' she writes (page 285), 'to find that the view that "all is mysterious" is to be regarded as a sign of hope. The rejection of the "billiard-ball view" of matter does not warrant the leap to any form of Idealism. Surely a view that finds a place for Mind in the universe only after the principle of uncertainty has been discovered or after abstruse physical speculations have made of physics a science not "understood of the people" is not a view that should commend itself to the earnest seeker after God, especially if that seeker be a Christian. At least, I should have thought not, were it not that Christian apologists have been so eager to wait upon the pronouncements of the physicists, so thankful to be assured that we put into Nature the laws we profess to discover and, finally, that the chairs we sit on are not solid.'

That Eddington should have re-christened Heisenberg's Principle (or perhaps we should say christened, since the principle is regarded as having such value in the vindication of spiritual reality) the Principle of *Indeterminacy* is not without significance ; for the new title contains within itself implications not present within the old—implications not merely of pervasive inaccuracy, but of vagueness and, with another slight twist, inherent mystery. 'Heisenberg now makes it appear,' says Jeans, 'that nature abhors accuracy and precision above all things.' Such a statement is, as the author points out, both the result and the cause of serious confusion. To suppose 'that the uncertainty relations show that there is anything *indeterminate* in nature or that science has now become inaccurate' is not merely to jump to a conclusion, but to take a most hazardous leap in the dark. 'Granted that in a given case the initial conditions are determined as precisely as the Principle of Uncertainty permits, then the probability of all subsequent states is determined by *exact laws* . . . There is nothing *lawless* in quanta phenomena.' (p. 183).

A no less unfortunate confusion is present in Eddington's conception of the nature of scientific method. To construct a

'symbolic world' which, though logical and coherent in itself, shall somehow 'shadow' the world of everyday experience, and in 'shadowing' it—rather in the manner that a detective shadows a suspect—shed some light upon its nature: that, according to Eddington, is the physicists' conception of the primary object of science. What is the point of this symbolic construction. Miss Stebbing succeeds in adducing three possible alternatives. Either the construction is an *imitation* of the familiar world, or it is intended to be more *real* than the familiar world, or finally it is a means whereby we can 'correlate certain selected elements in the familiar world,' to the end that we may extend and order what is sensibly experienced. The difficulty is to discover which of these alternatives is consistent with Eddington's argument. That the researches of physicists give us the 'real truth' about the familiar world, is something that he takes an almost visible pleasure in questioning. And in view of his description of his method as being one 'by which we build up from its own symbolic elements a world which will imitate the actual behaviour of the world of familiar experience,' it seems clear that by Imitation he means something altogether different from the Aristotelian *μίμησις*, which, in tragedy for example, involved the portrayal of men 'as better than they are.' To the third alternative, if not perhaps to all of its implications, Eddington exhibits even greater antipathy than to the first; with the result that he seems finally to hover between the first two without committing himself wholeheartedly to either; which involves him in innumerable confusions and imprecisions. Most of these blemishes would be removed if Eddington—whose mind, like that of Bosanquet, seems to be conditioned to the belief that what is self-evident must for that reason be false—were to overcome his objection to what is after all the obvious and rational view, namely, 'that physical science is concerned with one world, and with those aspects alone of what is sensibly perceived in it that are susceptible of metrical treatment. To put the point in this way would be to avoid the puzzling multiplications of 'worlds'—which have subsequently to be interlinked—and would also avoid the wholly baffling notion of a complex of metrical symbols as *shadowing* tables, stars, and eclipses. To put the point in this way is, however, not agreeable to Eddington. To conceive of the limitations of physical science as a restriction only of the scope

of the science itself—a restriction necessitated by the aims of its research—would be to destroy the foundations of his metaphysic.’ (p. 116).

No one, unless he is very sure of his ground, is going to dispute the scientific ability of either Eddington or Jeans. To issue a challenge of that kind certainly did not form part of the original intention of either Miss Stebbing or Mr. J. L. Russell. ‘The fundamental objection to the modes of expression so dear to both Eddington and Jeans,’ writes Miss Stebbing (p. 18) ‘is not merely that they are unilluminating; it is that such writing obfuscates the common reader whilst pretending to enlighten him. These writers encourage the reader to believe that he has understood a theory when he has only been entertained by an irrelevant illustration.’ In short, Miss Stebbing’s book is concerned above all with the fundamental problems of language and communication. I do not think that it is as constructive as it might be (can we compromise, for example, between the method of exposition typified by the *Principia Mathematica* and the cheery baby-talk of Eddington?); but it at least sets the stage for a solution. There is no reason to complain if it demands that we should do some thinking for ourselves.

That Eddington is by no means unaware of the pitfalls in which his expository method is liable to involve him, is clear from his book *New Pathways in Science* (p. 279), where he discusses this difficulty freely. ‘I take it,’ he says, ‘that the aim of such books [of popular scientific exposition] must be to convey exact thought in inexact language. The author has abjured the technical terms and mathematical symbols which are the recognized means of securing exact expression, and he is thrown back on more indirect methods of awakening in the mind of the reader the thought which he wishes to convey.’ This contention is of considerable interest; and it raises a question to which reference may profitably be made in conclusion. In the first place, the distinction between employing technical terms and mathematical symbols, which are held to be ‘the recognized means of securing exact expression,’ and the method of ‘awakening in the mind of the reader’—presumably by ‘inexact language’—the thought to be conveyed, seems to me far from clear; one is restrained from wondering whether it is itself an example of ‘exact thought in inexact

language' only by the reflection that such thought could hardly be rendered more precise by the employment of 'technical terms and mathematical symbols.' Secondly, it is not clear whether the 'means' spoken of as capable of 'awakening in the mind the thought to be conveyed' is 'inexact language' itself or some other thing to which such language is a means. Such a question can be answered only if we are clear as to whether the 'thought' to which the reader is thereby awakened is *exact* thought (distinguished from thought conveyed by symbols and technical terms merely by the method of conveyance) or thought of a less pure variety. In the former case, it is difficult to see wherein the superiority of technical terms and symbols over 'inexact language' consists; in the latter case, it is difficult to see in what respect the result can be regarded as thought at all (inexact thought is error). For what precisely do we mean when we speak of 'inexact language'? Language, surely, is inexact to the extent that it fails to be an efficient medium of thought. To hold that language is aiming at an exactitude such that failure to achieve it results in an inexactitude of anything but thought, is impossible. The attempt to express 'exact thought in inexact language' is simply an attempt to express something accurately by means of that which is by definition incapable of so expressing it; the inexactitude of the *language* will be nothing but the measure of its incapacity to express the thought. We speak often of books that are well thought-out but ill-written—usually books by scientists; but as Croce observes in his *Aesthetic*, this means merely that the composition of such works is unequal—in some places clear, in others diffuse. That thoughts can be both well 'thought-out' and badly 'written-out' is an idea the absurdity of which can be seen if we consider a single proposition: for how could a single proposition be both ill-thought but well-expressed, or both well-expressed and ill-thought?

Finally, we are tempted to question Eddington's assumption that, in employing the medium of 'inexact' language, he is able to effect an 'awakening in the mind of the reader of the thought which he wishes to convey.' One's own experience of the kind of writing to which he refers is that, far from having the effect of rousing one from one's slumbers, it is the best possible soporific that could be devised. Possibly a greater offender in this

respect than Eddington is Jeans, whose aim would sometimes appear to be not merely to induce sleep, but actually to hypnotise. The rhapsody on Cosmic Loneliness at the beginning of *The Mysterious Universe*, for instance, is not placed at the beginning for nothing ; it sets the theme, as it were, and induces a state of not altogether unpleasant *frissonnement* which the succeeding pages, with their presdigation with the relative measurements of men and constellations, do nothing to allay. It seems, therefore, that what is conveyed by the 'inexact language' for which Eddington can find no substitute is not 'exact thought' at all, but rather something that not infrequently takes the form of a penumbra to inexact thought: I mean emotion. Not the *magnitude* of the 'infinite spaces' terrified Pascal, but, as Mr. Eliot has pointed out, their *silence*. Not that it *loomed*, but that it was dumb, was the reason for de Vigny's horror of the empyrean. Perhaps, after all, the 'inexact language' of Eddington is exactly suited to the purpose which it is intended to serve.

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*SCIENCE AND SOCIAL WELFARE IN THE AGE OF
NEWTON*, by G. N. Clarke (Clarendon Press, Oxford, 6/-).

This small book provides a very able survey of the position of science at a critical period in history. It is in fact a study in relationships and, apart from other commendable features, it has a particular value for the student and the layman in emphasizing the importance of relationships in development.

Specially interesting is the section assessing the influence of science on the life of the time, and of the reciprocal influence of other factors on the development of science. Some discussion is given to the premises of Professor B. Hessen's essay which attracted much attention in 1931 ('The social and economic roots of Newton's *Principia*' in the symposium 'Science at the Cross-Roads'). This is subjected to further analysis in the course of which Professor Clarke presents a good case for the influence of six factors on the development of science. In distinction Hessen came to the conclusion that 'the scheme of physics was mainly