PREFACE

I am unhappy at the thought of presenting yet another philosophy. There have been so many statements of reality with a personal twist—outlines of philosophy, science, sociology or religion—and such varied interpretations of dead writers. No one ever seems quite satisfied with anyone else's views.

Again, an author relies largely on his feelings of the 'roundedness' and satisfactoriness of his own theory; he feels it strengthened by each new problem which occurs to him and appears to find an answer in terms of it, just as a good scientific theory finds confirmation in meeting new facts successfully. But in a theoretical study such as philosophy the new facts which present themselves are determined more by one's mental make-up than by an impartial sampling of reality; for it is association rather than experience which presents them. So even this 'coherence test of truth' may indicate, as perhaps it does in the case of Kant's 'architectonic', not so much the objective validity of the theory as the groove in which the author's mind runs. Instead of his theory being as wide as reality, his perception of reality may be as narrow as his theory.

Besides, if my view of the deceptiveness of verbal precision happens to be correct, the analysis of apparently definite perceptual situations or concepts stirs up a bottomless morass where statement becomes increasingly difficult and judgment more uncertain. Yet is it not possible that some definite contribution to the solution of philosophical problems may come from the application of the various experimental methods which have advanced the sciences? It may be that some—particularly ontological—problems are not open to

such treatment; but it seems to me that the peculiar difficulty of philosophical problems is only increased by the employment of methods of description and explanation which would fail to give a satisfactory account of physical phenomena, a considerable understanding of whose mechanism *can* be communicated by one person to another by suitable means. This problem will be discussed in connection with 'false hypostatisation', the theory of implication as a system of 'artificial causation' and the 'paralleling' theory of thought.

I am grateful to Dr Alice Heim for reading the original and clarifying the English in many places.

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THE NATURE OF EXPLANATION

INTRODUCTION

The present state of philosophy

PHILOSOPHY seems at present to be in a stage of transition between the *a priorism* of the past and perhaps an experimental philosophy in the future. Thus, much of the old *a priorism* has been shaken off; the advances of the positive sciences have shown that the data of Aristotelian, Platonic, or Berkeleian days were less adequate than those now available for considering the relation between nervous and mental processes, the nature of the atom and of causal conjunctions, the type of visual perception found in adults who have regained their sight by corneal grafting and so forth. No one would now dare to draw up a list of self-evident but not tautologous propositions nor to derive a philosophical system from them by deduction as Spinoza did, and some caution is shown even in the reification previously so common—the talk of the self and its simplicity. The positive sciences have introduced their own methodology—induction supported by experiments to test hypotheses. The fundamental feature of such procedure is that it is never necessary to be sure that the conditions have been defined with complete exactness and finality—indeed, it is recognised that this is impossible. Rather the aim is to do experiments, described as exactly as possible, and lay the emphasis on the fact that they work—that they fulfil predictions, or confirm other experiments. The importance of a theory lies not in the degree of finality attained by definition and analysis, but in the power and

grasp of general principles appearing in diverse instances. Advances in the design of wireless sets lie not in the exactness with which a valve is defined but in the faithfulness with which the original sound is reproduced or the range of the set, and the same applies even in the most theoretical aspects of physics: the aim is extensive (though not in the sense of formal) rather than intensive—to cover a multitude of facts so that they appear familiar and predictable and to be able to say: 'I told you what would happen, and I was right; I will tell you again, and I shall probably be right.' This procedure has, of course, been made the basis of various types of philosophy—of pragmatism, positivism, and to some extent of operationalism; indeed, it has been overdone; sometimes the practical aspect has been so emphasised as to suggest that nothing really exists except the actual experimental procedures used by scientists, and that even they can prove the existence of nothing except their own experiments! But the likelihood remains that physics has proceeded successfully without a philosophy just because its experimental procedure is, in some way which we shall examine in more detail later, self-verifying and self-justifying, and philosophy had better ask whether the same does not apply to itself. Perhaps one function of philosophy is to consider the nature of this self-validation. The point where philosophy at the moment shows its old *a priorism* is in its search for rigid definitions and reification without contradiction. The philosophy of perception seeks description in terms of the observer and the object observed; and to avoid falling into difficulty with errors, hallucinations, sensory abnormalities, differences in previous experience and so forth, it is led to postulate further entities such as sense-data whose realm of existence is extremely uncertain. When driven into a corner it seeks refuge in still greater rigidity of definition. For instance, it may escape into the strict formalism of Russell

and Whitehead's symbolic logic—a garden where all is neat and tidy but bearing little relation to the untidy tangle of experience from which the experimentalist tries to derive his principles. Or it may fly to the somewhat similar confines of logical positivism where, again, the difficulties are attributed to the inexact or ambiguous use of words, and it is implied that their use in one or more exactly defined senses will save the situation, and if this seems to restrict the range of problems somewhat—well, it cannot be helped. It is this effort at still greater rigidity of definition which is, in my view, the fundamental error, though I hope later to show why it should be so great a temptation. It seems to contradict the fundamental lesson learned from the positive sciences—namely, that you can never prove the existence of any external thing, or its obedience to a particular law, by trying to wring the truth out of a particular example; you must vary the conditions, repeat the experiments, make a hypothesis and a remote inference from that hypothesis and test it out. In any particular experiment some unforeseen factor may be at work; you cannot safely pick up a single stone, pass it to a friend and say: 'There, in your hand, you hold a perfect example of the law of gravitation; analyse its behaviour, and you will know all.' On the contrary, the earthward pull of that particular stone may be partly due to magnetic iron ore in it. If we let it fall, its rate of descent will not be simply due to its acceleration under gravity but will be reduced by air resistance. Its mass cannot be determined with perfect exactness and may vary with humidity, erosion of its surface and so on. It is only by taking numerous examples and tracking down the problem from all sides that we can extract the truth; we can never wring it out of the particular example. Even if, when our knowledge is considerable, we can specify a fairly 'perfect' example—e.g. a lump of gold falling in a vacuum—this is

merely the result, not the means, of our knowledge, and our perfect example may prove only to be one of many imperfect, indirect approaches to the next unknown problem where again we cannot prescribe and define exactly. Surely the philosophical method of exact definition and unambiguous statement makes exactly this error. It tries to 'pin down' the problem to a single instance; it says, 'Here am I, myself, perceiving a stick', and proceeds to define perception as the observation of sense-data, which forces us to the conclusion that I may be really and truly perceiving the stick in the aforesaid sense, but that I know very little about the stick, compared with what the positive sciences have told me. The trouble, perhaps, is that the positive sciences are often alluded to as the *exact* sciences, and that they do, indeed, inherit a number of apparently precise definitions from their complacent past. But every day these definitions—for instance of force, mass and velocity in terms of each other for the purposes of mechanics—prove slightly inapplicable to 'real' force, mass and velocity as new facts such as relativity effects are found by experiment. The old definitions still serve a useful purpose—more useful, often, than their more modern and complicated counterparts. This perhaps is the root of the matter: scientists and philosophers alike are distressed that inexact definitions should work well, both for practical and theoretical purposes. Whenever a paradox *does* arise, they attribute it to this inexactness, which is partially correct; but they fail to see that their remedy of exact definition may be impossible and unattainable by the very nature of the physical world and of human perception, and that their definition should be corrected in the way of greater extensiveness and denotative power, rather than greater analytical, intensive or connotative exactitude. For instance, when the perception or the description of reality meets with difficulties such as the paradoxes of error and illusion the

philosopher should not retire within his own fortress, withdraw his brave claims to be knowing reality, and defend bitterly a few strongholds such as the self and sense-data. Rather he should launch out and try to gain widespread support for his theory of perception by linking it with physiological and physical processes, and making vague but general alliances with the great world of facts outside him. Then, gradually, will come self-verification—the advance of a theory of which we can say, 'Yes, it works.' We shall be unable to say rigidly what we mean by 'yes', or 'it', or 'works', but the fact will remain that something is happening—a theory and a group of general principles are holding true and being fulfilled in a way which is almost infinitely improbable if there is no causality. There will always remain the opportunity for investigating the nature of principles, and the meaning of such ideas as that of principles 'working' or 'holding true', but the final road to progress will lie not in the search for analytical exactitude in verbal definition but in the self-validatory procedure of experiment and hypothesis. The important feature of a concept is that it should be exact *in the right way*—i.e. true—not just internally precise.

Finally, I do not think it is philosophy alone but science also which needs an experimental philosophy; for, although specific discoveries will continue to be made by particular sciences there are many experimental problems—such as the relation between nervous activity and thought, between physiological conditions and mental disease, between abnormal physical and physiological conditions and error or illusion—which are unlikely to be tackled by the pure psychologist or the pure physiologist, but are likely to be as fruitful as many other 'border-line sciences' like astrophysics or biochemistry. The general philosophical outlook coupled with a desire to establish results experimentally may bridge this gap between physiology and psychology.

CHAPTER I

The function and importance of explanation. Discussion of some current theories

WHAT do we mean by 'explaining' anything? This is a problem of considerable theoretical and practical importance. First of all, every science is concerned with explanation, and it should be as important to ask what is being *done*, in attempting to explain a phenomenon, as to ask what particular explanation is most satisfactory. Secondly, it has practical importance in that men differ as to what explanations are satisfactory, and whether it is necessary ever to go beyond the bounds of one science to find a satisfactory explanation of a phenomenon which at first sight seems clearly to belong to that science.

Perhaps the hardest blow was struck at the theory of explanation by Hume and later by quantum physicists. Previously, it had at least been held that explanation was concerned with finding the causes of events. Hume denied that we could ever point to any idea of 'causality', i.e. 'necessary connection' as apart from mere continual succession; and modern physics seems to say, in effect, that it has no use for causality since causality would hold only for immeasurable quantities and unobservable objects, if it held at all; and the purpose of science is taken to be the making of verifiable statements and predictions, rather than hypotheses about unobservables.

It is possible that the meaning of 'explanation' is different for different people; it may be one of those things which no one really understands, but which every scientist, or anyone else in a mood of curiosity, feels he desires. His particular ideal, felt rather than known, determines the kind of experiments he will choose to do, and the kind of answer he will accept. Nevertheless, there is a large field of explanation that is common to most men. Explanations are not purely subjective things; they win general approval, or have to be withdrawn in the face of evidence and criticism; and the man who can explain a phenomenon understands it, in the sense that he can predict it, and utilise it more than other men.

The question why one explanation or another should seem satisfactory involves the prior question why any explanation at all should be sought after and found satisfactory. It is clear that, in fact, the power to explain involves the power of insight and anticipation, and that this is very valuable as a kind of distance-receptor in time, which enables organisms to adapt themselves to situations which are about to arise. Apart from this utilitarian value it is likely that our thought processes are frustrated by the unique, the unexplained and the contradictory and that we have an impulse to resolve this state of frustration, whether or not there is any practical application. I shall give in Chapters V and VI a hypothetical explanation of this impulse, which may be experimentally verified or disproved in the course of time.

There are, then, five main attitudes to the problems of knowledge and explanation: *A priorism*, which asserts certain facts and principles to be self-evident or certain, and deduces a great body of supposed knowledge therefrom; *Scepticism*, which denies the legitimacy of these first principles, and questions some or all of the foundations of the belief in an external world and causal interaction; *Descriptive* theories, which assert that explanation is 'generalised description' but never tells us anything about the causes of events; *Relational* theories (represented by modern physics), which declare themselves to be uninterested in whether causal action be-

tween supposed ultimate units may be taking place, on the ground that things are unobservable and hence unpredictable; and that the aim of science is to find relations between observable entities which are constantly obeyed and hence permit successful predictions to be made. The foundation of this method is the association of definite probabilities, smaller than unity, with events. Finally, there are *Causal* theories, which hold that the events we see are the consequences of the interaction of external objects according to definite and certain rules.

Let us examine these different theories in turn, not with a view to establishing the validity of any one beyond all doubt, but to justify the pursuit of an experimental method.