Scientific Method in Philosophy

RUSSELL

OUR KNOWLEDGE OF THE EXTERNAL WORLD

AS A FIELD FOR SCIENTIFIC METHOD IN PHILOSOPHY

BY

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PREFACE

THE following lectures[1] are an attempt to show, by means of examples, the nature, capacity, and limitations of the logical-analytic method in philosophy. This method, of which the first complete example is to be found in the writings of Frege, has gradually, in the course of actual research, increasingly forced itself upon me as something perfectly definite, capable of embodiment in maxims, and adequate in all branches of philosophy, to yield whatever objective scientific knowledge it is possible to obtain. Most of the methods hitherto practised have professed to lead to more ambitious results than any that logical analysis can claim to reach, but unfortunately these results have always been such as many competent philosophers considered inadmissible. Regarded merely as hypotheses and as aids to imagination, the great systems of the past serve a very useful purpose, and are abundantly worthy of study. But something different is required if philosophy is to become a science, and to aim at results independent of the tastes and temperament of the philosopher who advocates them. In what follows, I have endeavoured to show, however imperfectly, the way by which I believe that this *desideratum* is to be found.

The central problem by which I have sought to illustrate method is the problem of the relation between the crude data of sense and the space, time, and matter of

[1] Delivered as Lowell Lectures in Boston, in March and April 1914.

mathematical physics. I have been made aware of the importance of this problem by my friend and collaborator Dr Whitehead, to whom are due almost all the differences between the views advocated here and those suggested in *The Problems of Philosophy*.[1] I owe to him the definition of points, the suggestion for the treatment of instants and "things," and the whole conception of the world of physics as a *construction* rather than an *inference*. What is said on these topics here is, in fact, a rough preliminary account of the more precise results which he is giving in the fourth volume of our *Principia Mathematica*.[2] It will be seen that if his way of dealing with these topics is capable of being successfully carried through, a wholly new light is thrown on the time-honoured controversies of realists and idealists, and a method is obtained of solving all that is soluble in their problem.

The speculations of the past as to the reality or unreality of the world of physics were baffled, at the outset, by the absence of any satisfactory theory of the mathematical infinite. This difficulty has been removed by the work of Georg Cantor. But the positive and detailed solution of the problem by means of mathematical constructions based upon sensible objects as data has only been rendered possible by the growth of mathematical logic, without which it is practically impossible to manipulate ideas of the requisite abstractness and complexity. This aspect, which is somewhat obscured in a merely popular outline such as is contained in the following lectures, will become plain as soon as Dr Whitehead's work is published. In pure logic, which, however, will be very briefly discussed in these lectures, I have had

[1] London and New York, 1912 ("Home University Library").

[2] The first volume was published at Cambridge in 1910, the second in 1912, and the third in 1913.

the benefit of vitally important discoveries, not yet published, by my friend Mr Ludwig Wittgenstein.

Since my purpose was to illustrate method, I have included much that is tentative and incomplete, for it is not by the study of finished structures alone that the manner of construction can be learnt. Except in regard to such matters as Cantor's theory of infinity, no finality is claimed for the theories suggested ; but I believe that where they are found to require modification, this will be discovered by substantially the same method as that which at present makes them appear probable, and it is on this ground that I ask the reader to be tolerant of their incompleteness.

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LECTURE 1

CURRENT TENDENCIES

PHILOSOPHY, from the earliest times, has made greater claims, and achieved fewer results, than any other branch of learning. Ever since Thales said that all is water, philosophers have been ready with glib assertions about the sum-total of things; and equally glib denials have come from other philosophers ever since Thales was contradicted by Anaximander. I believe that the time has now arrived when this unsatisfactory state of things can be brought to an end. In the following course of lectures I shall try, chiefly by taking certain special problems as examples, to indicate wherein the claims of philosophers have been excessive, and why their achievements have not been greater. The problems and the method of philosophy have, I believe, been misconceived by all schools, many of its traditional problems being insoluble with our means of knowledge, while other more neglected but not less important problems can, by a more patient and more adequate method, be solved with all the precision and certainty to which the most advanced sciences have attained.

Among present-day philosophies, we may distinguish three principal types, often combined in varying proportions by a single philosopher, but in essence and tendency distinct. The first of these, which I shall call the classical tradition, descends in the main from Kant and Hegel;

it represents the attempt to adapt to present needs the methods and results of the great constructive philosophers from Plato downwards. The second type, which may be called evolutionism, derived its predominance from Darwin, and must be reckoned as having had Herbert Spencer for its first philosophical representative; but in recent times it has become, chiefly through William James and M. Bergson, far bolder and far more searching in its innovations than it was in the hands of Herbert Spencer. The third type, which may be called "logical atomism" for want of a better name, has gradually crept into philosophy through the critical scrutiny of mathematics. This type of philosophy, which is the one that I wish to advocate, has not as yet many whole-hearted adherents, but the "new realism" which owes its inception to Harvard is very largely impregnated with its spirit. It represents, I believe, the same kind of advance as was introduced into physics by Galileo: the substitution of piecemeal, detailed, and verifiable results for large untested generalities recommended only by a certain appeal to imagination. But before we can understand the changes advocated by this new philosophy, we must briefly examine and criticise the other two types with which it has to contend.

A. The Classical Tradition

Twenty years ago, the classical tradition, having vanquished the opposing tradition of the English empiricists, held almost unquestioned sway in all Anglo-Saxon universities. At the present day, though it is losing ground, many of the most prominent teachers still adhere to it. In academic France, in spite of M. Bergson, it is far stronger than all its opponents combined; and in Germany it has many vigorous advocates. Nevertheless,

it represents on the whole a decaying force, and it has failed to adapt itself to the temper of the age. Its advocates are, in the main, those whose extra-philosophical knowledge is literary, rather than those who have felt the inspiration of science. There are, apart from reasoned arguments, certain general intellectual forces against it—the same general forces which are breaking down the other great syntheses of the past, and making our age one of bewildered groping where our ancestors walked in the clear daylight of unquestioning certainty.

The original impulse out of which the classical tradition developed was the naïve faith of the Greek philosophers in the omnipotence of reasoning. The discovery of geometry had intoxicated them, and its *a priori* deductive method appeared capable of universal application. They would prove, for instance, that all reality is one, that there is no such thing as change, that the world of sense is a world of mere illusion ; and the strangeness of their results gave them no qualms because they believed in the correctness of their reasoning. Thus it came to be thought that by mere thinking the most surprising and important truths concerning the whole of reality could be established with a certainty which no contrary observations could shake. As the vital impulse of the early philosophers died away, its place was taken by authority and tradition, reinforced, in the Middle Ages and almost to our own day, by systematic theology. Modern philosophy, from Descartes onwards, though not bound by authority like that of the Middle Ages, still accepted more or less uncritically the Aristotelian logic. Moreover, it still believed, except in Great Britain, that *a priori* reasoning could reveal otherwise undiscoverable secrets about the universe, and could prove reality to be quite different from what, to direct observation, it appears to be. It is

this belief, rather than any particular tenets resulting from it, that I regard as the distinguishing characteristic of the classical tradition, and as hitherto the main obstacle to a scientific attitude in philosophy.

The nature of the philosophy embodied in the classical tradition may be made clearer by taking a particular exponent as an illustration. For this purpose, let us consider for a moment the doctrines of Mr Bradley, who is probably the most distinguished living representative of this school. Mr Bradley's *Appearance and Reality* is a book consisting of two parts, the first called *Appearance*, the second *Reality*. The first part examines and condemns almost all that makes up our everyday world: things and qualities, relations, space and time, change, causation, activity, the self. All these, though in some sense facts which qualify reality, are not real as they appear. What is real is one single, indivisible, timeless whole, called the Absolute, which is in some sense spiritual, but does not consist of souls, or of thought and will as we know them. And all this is established by abstract logical reasoning professing to find self-contradictions in the categories condemned as mere appearance, and to leave no tenable alternative to the kind of Absolute which is finally affirmed to be real.

One brief example may suffice to illustrate Mr Bradley's method. The world appears to be full of many things with various relations to each other—right and left, before and after, father and son, and so on. But relations, according to Mr Bradley, are found on examination to be self-contradictory and therefore impossible. He first argues that, if there are relations, there must be qualities between which they hold. This part of his argument need not detain us. He then proceeds:

"But how the relation can stand to the qualities is,

on the other side, unintelligible. If it is nothing to the qualities, then they are not related at all; and, if so, as we saw, they have ceased to be qualities, and their relation is a nonentity. But if it is to be something to them, then clearly we shall require a *new* connecting relation. For the relation hardly can be the mere adjective of one or both of its terms; or, at least, as such it seems indefensible. And, being something itself, if it does not itself bear a relation to the terms, in what intelligible way will it succeed in being anything to them? But here again we are hurried off into the eddy of a hopeless process, since we are forced to go on finding new relations without end. The links are united by a link, and this bond of union is a link which also has two ends; and these require each a fresh link to connect them with the old. The problem is to find how the relation can stand to its qualities, and this problem is insoluble."[1]

I do not propose to examine this argument in detail, or to show the exact points where, in my opinion, it is fallacious. I have quoted it only as an example of method. Most people will admit, I think, that it is calculated to produce bewilderment rather than conviction, because there is more likelihood of error in a very subtle, abstract, and difficult argument than in so patent a fact as the interrelatedness of the things in the world. To the early Greeks, to whom geometry was practically the only known science, it was possible to follow reasoning with assent even when it led to the strangest conclusions. But to us, with our methods of experiment and observation, our knowledge of the long history of *a priori* errors refuted by empirical science, it has become natural to suspect a fallacy in any deduction of which the conclusion appears to contradict patent facts. It is easy to carry

[1] *Appearance and Reality*, pp. 32–33.

such suspicion too far, and it is very desirable, if possible, actually to discover the exact nature of the error when it exists. But there is no doubt that what we may call the empirical outlook has become part of most educated people's habit of mind ; and it is this, rather than any definite argument, that has diminished the hold of the classical tradition upon students of philosophy and the instructed public generally.

The function of logic in philosophy, as I shall try to show at a later stage, is all-important ; but I do not think its function is that which it has in the classical tradition. In that tradition, logic becomes constructive through negation. Where a number of alternatives seem, at first sight, to be equally possible, logic is made to condemn all of them except one, and that one is then pronounced to be realised in the actual world. Thus the world is constructed by means of logic, with little or no appeal to concrete experience. The true function of logic is, in my opinion, exactly the opposite of this. As applied to matters of experience, it is analytic rather than constructive ; taken *a priori*, it shows the possibility of hitherto unsuspected alternatives more often than the impossibility of alternatives which seemed *prima facie* possible. Thus, while it liberates imagination as to what the world *may* be, it refuses to legislate as to what the world *is*. This change, which has been brought about by an internal revolution in logic, has swept away the ambitious constructions of traditional metaphysics, even for those whose faith in logic is greatest ; while to the many who regard logic as a chimera the paradoxical systems to which it has given rise do not seem worthy even of refutation. Thus on all sides these systems have ceased to attract, and even the philosophical world tends more and more to pass them by.

One or two of the favourite doctrines of the school we are considering may be mentioned to illustrate the nature of its claims. The universe, it tells us, is an "organic unity," like an animal or a perfect work of art. By this it means, roughly speaking, that all the different parts fit together and co-operate, and are what they are because of their place in the whole. This belief is sometimes advanced dogmatically, while at other times it is defended by certain logical arguments. If it is true, every part of the universe is a microcosm, a miniature reflection of the whole. If we knew ourselves thoroughly, according to this doctrine, we should know everything. Common sense would naturally object that there are people—say in China—with whom our relations are so indirect and trivial that we cannot infer anything important as to them from any fact about ourselves. If there are living beings in Mars or in more distant parts of the universe, the same argument becomes even stronger. But further, perhaps the whole contents of the space and time in which we live form only one of many universes, each seeming to itself complete. And thus the conception of the necessary unity of all that is resolves itself into the poverty of imagination, and a freer logic emancipates us from the strait-waistcoated benevolent institution which idealism palms off as the totality of being.

Another very important doctrine held by most, though not all, of the school we are examining is the doctrine that all reality is what is called "mental" or "spiritual," or that, at any rate, all reality is dependent for its existence upon what is mental. This view is often particularised into the form which states that the relation of knower and known is fundamental, and that nothing can exist unless it either knows or is known. Here again the same legislative function is ascribed to *a priori* argumentation :

it is thought that there are contradictions in an unknown reality. Again, if I am not mistaken, the argument is fallacious, and a better logic will show that no limits can be set to the extent and nature of the unknown. And when I speak of the unknown, I do not mean merely what we personally do not know, but what is not known to any mind. Here as elsewhere, while the older logic shut out possibilities and imprisoned imagination within the walls of the familiar, the newer logic shows rather what may happen, and refuses to decide as to what *must* happen.

The classical tradition in philosophy is the last surviving child of two very diverse parents : the Greek belief in reason, and the mediæval belief in the tidiness of the universe. To the schoolmen, who lived amid wars, massacres, and pestilences, nothing appeared so delightful as safety and order. In their idealising dreams, it was safety and order that they sought : the universe of Thomas Aquinas or Dante is as small and neat as a Dutch interior. To us, to whom safety has become monotony, to whom the primeval savageries of nature are so remote as to become a mere pleasing condiment to our ordered routine, the world of dreams is very different from what it was amid the wars of Guelf and Ghibelline. Hence William James's protest against what he calls the "block universe" of the classical tradition ; hence Nietzsche's worship of force ; hence the verbal bloodthirstiness of many quiet literary men. The barbaric substratum of human nature, unsatisfied in action, finds an outlet in imagination. In philosophy, as elsewhere, this tendency is visible ; and it is this, rather than formal argument, that has thrust aside the classical tradition for a philosophy which fancies itself more virile and more vital.

B. Evolutionism

Evolutionism, in one form or another, is the prevailing creed of our time. It dominates our politics, our literature, and not least our philosophy. Nietzsche, pragmatism, Bergson, are phases in its philosophic development, and their popularity far beyond the circles of professional philosophers shows its consonance with the spirit of the age. It believes itself firmly based on science, a liberator of hopes, an inspirer of an invigorating faith in human power, a sure antidote to the ratiocinative authority of the Greeks and the dogmatic authority of mediæval systems. Against so fashionable and so agreeable a creed it may seem useless to raise a protest; and with much of its spirit every modern man must be in sympathy. But I think that, in the intoxication of a quick success, much that is important and vital to a true understanding of the universe has been forgotten. Something of Hellenism must be combined with the new spirit before it can emerge from the ardour of youth into the wisdom of manhood. And it is time to remember that biology is neither the only science, nor yet the model to which all other sciences must adapt themselves. Evolutionism, as I shall try to show, is not a truly scientific philosophy, either in its method or in the problems which it considers. The true scientific philosophy is something more arduous and more aloof, appealing to less mundane hopes, and requiring a severer discipline for its successful practice.

Darwin's *Origin of Species* persuaded the world that the difference between different species of animals and plants is not the fixed, immutable difference that it appears to be. The doctrine of natural kinds, which had rendered classification easy and definite, which was enshrined in