

The Logical Basis of Metaphysics

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Harvard University Press Cambridge, Massachusetts

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Preface

I was honoured to be invited by Harvard University to give the 1976 William James Lectures, which are, in alternate years, in philosophy and psychology. When the invitation was issued, I was informed that a condition of acceptance was that I allow the lectures to be published by Harvard University Press, a condition to which I naturally agreed. Accordingly, I typed out the text of my lectures, which I should not otherwise have done, preferring normally to lecture without a script, and usually without notes, for the sake of greater spontaneity and rapport with the audience. Unlike Hilary Putnam, who was simultaneously giving the John Locke Lectures at Oxford, I did not arrive with texts of the lectures already written, but, living from hand to mouth as always, composed them at Harvard as I went along. Before I returned, via Jerusalem, to England at the beginning of May, I left the type-written text with Harvard University Press and deposited another copy in the Harvard Philosophy Department library. Asked by the Press how soon they might expect a revised version for publication, I replied, 'By Christmas'.

I tried to keep my promise. I worked on the revision throughout the summer but had not completed it by November, when other obligations, including conducting the Wardenship election at All Souls' College, of which I was then Sub-Warden, forced me to set it aside. My revised text subsequently went astray, but the original sat untouched, in mute reproach, upon my shelves for years. The Press was wonderfully tolerant, sending, at long intervals, letters that politely enquired, but never chivied. In about 1978, I gave a course of lectures called 'The Justification and Criticism of Logical Laws', which elaborated in great detail, and with new ideas, a small part of the lectures; from that point on, I knew that any final revision of them would necessarily be very heavy. Other things always seemed to have a valid claim to priority. After I became a professor in 1979, and increasingly after Mrs. Thatcher's assault on the universities began, teaching and administra-

tive duties have piled so high as to make work on any long-term project unfeasible; I nevertheless maintained a steady resolve to redeem my promise to Harvard. A year's sabbatical leave, spent at the Center for Advanced Study in the Behavioral Sciences at Stanford, an ideal environment in which to work, has enabled me at last to do so, and I am deeply grateful to the Center for electing me a Fellow and providing that environment, and to the Andrew W. Mellon Foundation for financial support.

It is not an easy task to revise something written thirteen years before. These are not the William James Lectures, as delivered; but they are not exactly what I should write now if I were starting afresh to write a book upon this subject. They are a compromise between these. I have tried to retain the plan, and as much of the substance as possible, of the original lectures; but the revision is nevertheless very heavy. Many passages I found inadequate, or simply wrong, and have thoroughly rewritten. Remarks like 'There is no time to go into this here' could not stand in a version published after so long a time, and I have tried to fill the lacunas. I hope the resulting book, of which extensive parts are newly written, and equally extensive parts are no more than stylistic emendations of material composed in 1976, is nonetheless coherent. Although I have attempted to acknowledge the source of ideas I have derived from others, I found a few passages saying things I have not said elsewhere, but which others have subsequently said independently: I decided to let these stand without citing the corroborations. Also problematic were passages whose substance I *have* subsequently put in print; but I likewise decided that to excise them would mar the flow of the argument. In the course of revision, the book has become about two-thirds as long again as the lectures. There are normally eight William James lectures, but I had difficulty in cramming my material into that space, and the Harvard Philosophy Department kindly permitted me to give nine. For reasons of the kind already indicated, their revision has caused a further expansion. There is little here, however, that does not correspond to something in the original text, if only to a remark that an adequate treatment would require discussion of a topic left untouched. The Introduction is an integral part of the whole, representing the substance of the first lecture.

My aim was to achieve a prolegomenon to the work I still hoped to do in philosophy, and regard as one of its major tasks, to resolve the problems concerning realism in its various specific manifestations. I have not yet made substantial progress with this task, and now probably never shall; I shall be content if I have persuaded sufficiently many people of its importance, and of the correctness of my strategy for

tackling it, to make it likely that others will achieve what I once hoped to. The prolegomenon was intended to clarify the nature of a meaning-theory and its relation to the semantic theories employed by logicians, and to explain why a meaning-theory need not be subservient to existing practice, but could criticise it and propose revisions to it, and, in particular, how it can serve either to justify or to call in question generally accepted forms of reasoning. I am aware how anti-Wittgensteinian this programme is. We all stand, or should stand, in the shadow of Wittgenstein, in the same way that much earlier generations once stood in the shadow of Kant; and one of my complaints about many contemporary American philosophers is that they appear never to have read Wittgenstein. Some things in his philosophy, however, I cannot see any reason for accepting: and one is the belief that philosophy, as such, must never criticise but only describe. This belief was fundamental in the sense that it determined the whole manner in which, in his later writings, he discussed philosophical problems; not sharing it, I could not respect his work as I do if I regarded his arguments and insights as depending on the truth of that belief.

When I had finished the lectures, I felt a deep satisfaction that I had achieved what seemed to me a definitive prolegomenon, and could now advance to the main task. Naturally, upon my re-reading them thirteen years later, that satisfaction has waned somewhat: I am more aware of the diversity of philosophical opinion, less optimistic about the probability of persuading others, and doubtless less certain of the correctness of my own views. I hope, however, to have succeeded in presenting a clear and even persuasive conception of a methodology for the theory of meaning and a case for the underlying importance of that branch of philosophy for its more glamorous relative, metaphysics.

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Stanford, California, 1989

Metaphysical Disputes over Realism

The layman or non-professional expects philosophers to answer deep questions of great import for an understanding of the world. Do we have free will? Can the soul, or the mind, exist apart from the body? How can we tell what is right and what is wrong? *Is* there any right and wrong, or do we just make it up? Could we know the future or affect the past? Is there a God? And the layman is quite right: if philosophy does not aim at answering such questions, it is worth nothing. Yet he finds most writing by philosophers of the analytical school disconcertingly remote from these concerns. Their writing treats, often with a battery of technical devices, of matters, like the meanings of proper names and the logical form of a sentence ascribing a belief to someone, that apparently have no bearing on the great questions with which philosophy ought to deal. The complaint, though unjustified, is understandable; and there are various causes for the situation that prompts it. One is that analytical philosophy passed, comparatively recently, through a destructive phase; a few, indeed, have not yet emerged from it. During that phase, it appeared as though demolition was the principal legitimate task of philosophy. Now most of us believe once more that philosophy has a constructive task; but, so thoroughly was the demolition accomplished, that the rebuilding is of necessity slow. Secondly, although we no longer regard the traditional questions of philosophy as pseudo-questions to which no meaningful answer can be given, we have not returned to the belief that a priori reasoning can afford us substantive knowledge of fundamental features of the world. Philosophy can take us no further than enabling us to command a clear view of the concepts by means of which we think about the world, and, by so doing, to attain a firmer grasp of the way we represent the world in our thought. It is for this reason and in this sense that philosophy is about the world. Frege said of the laws of logic that they are not laws of nature but laws of the laws of nature. It makes no sense to try to observe the world to discover

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whether or not it obeys some given logical law. Reality cannot be said to obey a law of logic; it is our thinking about reality that obeys such a law or flouts it. What goes for the laws of logic goes more generally for the principles of philosophy. The optician cannot tell us what we are going to see when we look about us: he provides us with spectacles that bring all that we see into sharper focus. The philosopher aims to perform a similar service in respect of our thinking about reality. This means, however, that the starting point of philosophy has to be an analysis of the fundamental structure of our thoughts. What may be called the philosophy of thought underlies all the rest.

That brings us to the third reason why contemporary analytical philosophy appears so dissatisfying to the layman. To a large extent, the philosophy of thought has always been acknowledged as the starting point of philosophy. Aristotle's philosophy begins with the *Categories*; even Hegel wrote a *Logic* to serve as the foundation of his system. Where modern analytical philosophy differs is that it is founded upon a far more penetrating analysis of the general structure of our thoughts than was ever available in past ages, that which lies at the base of modern mathematical logic and was initiated by Frege in 1879. The central concern of logic is with inference, which lies somewhat off centre in the philosophy of thought. But there can be no analysis of inferences without a prior analysis of the structure of statements that can serve as premisses and conclusion. An advance in logic is therefore also an advance in the philosophy of thought; and the advance first achieved by Frege was immense. It was difficult to achieve because it involved refusing to be guided by the surface forms of sentences. Frege regarded his notation of quantifiers and variables less as a means of analysing language as we have it than as a device for *replacing* it by a symbolism better designed for carrying out rigorous deductive reasoning, insisting that he had provided not merely a means of representing thoughts but a language in which they could be expressed. It has proved to serve this purpose well. Mathematicians now as a matter of course use logical notation to give more perspicuous expression to their propositions, although their reasoning remains as informal as ever.

Logic, before Frege, was powerless to account for even quite simple forms of reasoning employed in mathematics. Once the breakthrough had taken place, the subject rapidly made advances incomparably greater than those previously made in its whole history. To enquire how much mathematical logic has contributed to philosophy is to ask the wrong question: analytical philosophy is written by people to whom the basic principles of the representation of propositions in the quantificational form that is the language of mathematical logic are as

familiar as the alphabet, however little many of them may know of the technical results or even concepts of modern logical theory. In large part, therefore, they take for granted the principles of semantic analysis embodied in this notation; whether or not they make use of technical vocabulary, this often renders their approach opaque to the layman.

It has until recently been a basic tenet of analytical philosophy, in its various manifestations, that the philosophy of thought can be approached only through the philosophy of language. That is to say, there can be no account of what thought is, independently of its means of expression; but the purpose of the philosophy of thought can be achieved by an explanation of what it is for the words and sentences of a language to have the meanings that they bear, an explanation making no appeal to an antecedent conception of the thoughts those sentences express. This approach to thought via language has certainly contributed to the alienation from analytical philosophy of the lay public, which superstitiously stigmatises all discussion of linguistic matters as trivial, through a psychological association as tenacious and irrational as that which causes all interest in playing cards or card games to be stigmatised as frivolous. The thesis of the priority of language over thought in the order of explanation is, obviously, important in itself; but its acceptance or rejection makes comparatively little difference to overall philosophical strategy, because doctrines concerning meaning can be fairly readily transposed into doctrines concerning thought, and vice versa. An analysis of the logical structure of sentences can be converted into a parallel analysis of the structure of thoughts, because by 'logical structure' is meant a representation of the relation of the parts of the sentence to one another that is adequate for the purposes of a semantic, or rather meaning-theoretical, treatment; it is that syntactic analysis in terms of which we may explain the sentence's having the meaning that constitutes it an expression of a certain thought. That is why Frege was able to claim that the structure of the sentence reflects the structure of the thought. Thus the thesis, in the philosophy of language, that the meaning of a sentence is determined by the condition for it to be true, can be at once transposed into the thesis, in the philosophy of thought, that the content of a thought is determined by the condition for *it* to be true: in either mode, arguments for and against the thesis are to a large extent the same. In recent years, a number of analytical philosophers, prominent among them the late Gareth Evans, have rejected the assumption of the priority of language over thought and have attempted to explain thought independently of its expression and then to found an account of language upon such a prior philosophical theory of thought. On the face

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of it, they are overturning the fundamental axiom of all analytical philosophy and hence have ceased to be analytical philosophers. In practice, the change makes a difference only at the very beginning: once their basic philosophy of thought is in place, all proceeds much as before. This is because, although they challenge the traditional strategy of explanation in analytical philosophy, they accept and make use of the same general doctrines concerning the structure of thoughts and sentences; they differ only about which is to be explained in terms of the other.

The shift of perspective characteristic of analytical philosophy brings about a partitioning of that part of philosophy known as metaphysics. Enquiries into the concepts of space, time, and matter belong to the philosophy of physics, which need not be focused exclusively on the theories of the physicists but equally cannot be pursued in disregard of them. Philosophical investigations of the concepts of objectivity and reality are of a different order, however. These grow directly out of the philosophy of thought; if they cannot be assigned a place within it, they belong to a part of philosophy contiguous to it.

Among them is a cluster of problems traditionally classified as typically metaphysical, problems bearing a structural similarity to one another but differing in subject matter. These are problems about whether or not we should take a realist attitude to this or that class of entity. In any one instance, realism is a definite doctrine. Its denial, by contrast may take any one of numerous possible forms, each of which is a variety of anti-realism concerning the given subject matter: the colourless term 'anti-realism' is apt as a signal that it denotes not a specific philosophical doctrine but the rejection of a doctrine.

The prototypical example is realism concerning the physical world, the world of macroscopic material objects. At least, philosophers usually discuss the physical universe as if it were composed exclusively of discrete objects; but mankind has from the beginning been familiar with matter in gaseous or liquid forms, with the air and the sea, with water, oil, and blood, and with what is not (or not obviously) matter but given off by material bodies, light, heat, sounds, and smells. Nowadays, we have also to reckon into the physical universe electric currents, radio waves, X-rays, and so on, and perhaps also gravitational and magnetic fields; a definition of the word 'physical' is not quite easily come by. Supposing that we know, at least roughly, what the physical universe comprises, there is a metaphysical dispute over whether or not we should assume a realist view of it. Opposed to realism about the physical world are various forms of idealism, of which the empiricist variety—phenomenalism—is the most obvious. Our knowledge of the physical world comes through the senses; but

are these channels of information about a reality that exists quite independently of us, as the realist supposes, or are our sense experiences constitutive of that reality, as the phenomenalist believes? John Stuart Mill gave a famous definition of matter as the permanent possibility of sensation. We can deny the objective status of conditional truths about the perceptual experiences of a hypothetical observer at a particular place and time only at the cost of falsifying all our statements about what has not actually been observed: but is there something underlying these conditionals, or are they ultimate truths that rest on nothing? In the former case, most of our statements about physical reality could as well be true in a universe devoid of sentient creatures, because it is not the fact that we do or might make certain observations that makes those statements true; but, in the latter case, there could no more be a physical world without observers than a poem without words.

An analogous controversy relates to a quite different subject matter, that of mathematics. Here the realists are usually known as 'platonists': they believe that a mathematical proposition describes, truly or falsely, a reality that exists as independently of us as the realist supposes the physical world to do. Opposition to platonism takes various forms. On the one hand, formalists say that there are no genuine mathematical propositions at all, only sentences bearing a formal resemblance to propositions, which we manipulate in accordance with rules that mimic deductive operations with ordinary meaningful propositions. Constructivists, on the other hand, do not deny that there are mathematical propositions but hold that they relate to our own mental operations; their truth therefore cannot outstrip our ability to prove them.

Just as some philosophers take a realist view and some an anti-realist view of matter, so some take a realist, and some an anti-realist, view of the mind. For the realist, a person's observable actions and behaviour are *evidence* of his inner states—his beliefs, desires, purposes, and feelings. Anti-realism in this case may take the form of behaviourism, according to which to ascribe to someone a belief or a desire, or even to attribute to him a pain or other sensation, is simply to say something about the pattern of his behaviour.

A similar dispute concerns the theoretical entities of science. Some of these—black holes, quarks, hidden dimensions, anti-matter, superstrings—seem bizarre; but it is difficult to make a sharp demarcation between constituents of the everyday world and those of the physicist's world. Electric currents were not but now are part of the everyday world; presumably radio waves must also be assigned to it. Nevertheless, there remains a controversy between scientific realists and instrumentalists. The realists believe that science progressively uncovers

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what the world is like in itself, explaining in the process why it appears to us as it does. They are opposed by instrumentalists, who regard theoretical entities as useful fictions enabling us to predict observable events; for them, the content of a theoretical statement is exhausted by its predictive power. This is one case in which the view opposed to realism is made more plausible by empirical results; for a realist interpretation of quantum mechanics appears to lead to intolerable antinomies.

In ethics there is a conflict between moral realists and subjectivists. For a moral realist, an ethical statement is as objectively true or false as one about the height of a mountain; for the subjectivist, it has the same status as a statement to the effect that something is interesting or boring. Something is interesting if it is capable of arousing a certain reaction in us; if we did not exist, or were never either interested or bored, nothing would be interesting and nothing boring. So it is, for the subjectivist, in calling an action cruel or dishonest. It is cruel or dishonest in so far as it is liable to evoke certain kinds of repugnance in those who know of it; there is no objective sense in which it would have been better if that action had not been performed.

The most perplexing of these disputes concern time. The phenomenalist, regarding physical objects as mentally constructed by us out of our sense experiences, must think the same of space, as a system of relations between physical objects; but he usually regards time as objective, since sense experiences themselves occur in time. According to the celebrated view of Kant, however, the temporal character of our experience is itself something imposed upon it by the mind; and post-Kantian idealists have concurred in regarding time as unreal. Augustine already provided a ground for looking on time with suspicion. Our experience is of the present, or, more exactly, of what is now presented to us, like the sound of distant thunder and the light of the stars and even of the Moon and the planets. Our future experience will be of what will be presented to us; our past experience was of what was presented to us. But the present is a mere boundary. We can apprehend a genuine line—not a pencil mark, which is merely a narrow strip, but a line in Euclid's sense—only as the boundary between two regions on a surface or the intersection of two surfaces. If the regions or surfaces did not exist, the line would not exist either. But then, it seems, the present is a mere boundary between two non-existents, between the past, which is no more, and the future, which is not yet.

This is a deep puzzle: but philosophers who try to solve it by denying the reality of time are now rare. Challenges to realism about one or other temporal region are more common. If statements about the

future are now determinately either true or false, how can we affect what is going to happen? How can there be room for choice between different possible courses of action, when it is already the case that one of them will in fact be followed? Why is it, moreover, that we cannot affect the past as we believe we can affect the future? It is not merely that we do not know how to do it: it appears to be nonsensical to suppose that we could do it. There is an inclination to say that the reason is that it is now either true or false that some event took place in the past, but not yet either true or false that some other event will occur in the future: the past is *there* in a sense that the future is not; the past is, as it were, part of present reality—of what is now the case—but the future is not. Many philosophers succumb to this inclination. Others resist the idea that there is so profound an ontological distinction between the past and the future: the difference, they hold, is primarily epistemological, residing in the fact that we know about the past in a way that we do not know about the future. These latter are realists about the future, as opposed to the neutralists who believe that there is a strong metaphysical sense in which the future is not yet, but only a weak tautological sense in which the past is no more.

The neutralist view is agreeable to common sense; the converse view, which challenges realism about the past, is grossly repugnant to it. Yet it was adopted by C. I. Lewis and, during his early, positivist, phase, by A. J. Ayer. The motivation for it lies in the inaccessibility of the past. Realism about the past entails that there are numerous true propositions forever in principle unknowable. The effects of a past event may simply dissipate: unless time is closed, so that the recent past is also the remote future, the occurrence of such an event is thereafter irrecoverable. To the realist, this is just part of the human condition; the anti-realist feels unknowability in principle to be intolerable and prefers to view our evidence for and memory of the past as constitutive of it. For him, there cannot be a past fact no evidence for which exists to be discovered, because it is the existence of such evidence that would make it a fact, if it were one.

One may of course combine a realist view of the past with a realist view of the future: both past and future are determinate—though perhaps not causally predetermined—and in some sense exist to render our statements in the past or future tense true or false. All that changes, the realist may say, is the location of our consciousness along the temporal dimension. But then *something* changes—namely, the position of our consciousness. Yet, if there is change in that respect, why not in other respects? Why should the past not change after our consciousness has travelled through it, and why should not the future now be in a different state from that in which it will be when our

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consciousness arrives at it? That supposition undermines the whole picture. For, if the past can change, what has its condition *now* to do with the truth or falsity of what we say about it? What we wished to speak about was how things were at that past time when our consciousness was at just that temporal location. It is now evident, however, that even the supposition that past and future do not change will not rescue us from the dilemma: for it is not their *present* condition, whether or not liable to change, that we intended to talk about but their condition at the time when our consciousness was or will be at the relevant point in its journey from past to future, so that we were or shall be able to observe the events then taking place. The picture of the enduring past and the awaiting future thus fails to accomplish what it aimed at, namely, to show what makes the statement we now make about past or future determinately true or false. If we eliminate enduring past and awaiting future from the picture, we are left with the ever-changing present, that is, simply the ever-changing world about us, or more exactly the periphery of the backwards light cone. The present, or the presently observed or presently observable, is all there *is*: it is futile to try to invent a sense in which what was is nevertheless *still* there, what will be *already* there. Are we thus committed to being anti-realists about both past and future, to saying that, when nothing that *now* exists renders some past- or future-tense statement true or false, there simply is nothing to make it true or false? Can a proposition be true if there is nothing in virtue of which it is true?

We are swimming in deep waters of metaphysics. How can we attain the shore? These various metaphysical controversies have a wide range of subject matters but a marked resemblance in the forms of argument used by the opposing factions. No doubt, light will be cast upon each of these disputes by studying them comparatively; even so, we need a strategy for resolving them. Our decisions in favour of realism or against it in any one of these instances must certainly make a profound difference to our conception of reality: but what means do we have to arrive at a decision? No observation of ordinary physical objects or processes will tell us whether they exist independently of our observation of them. Admittedly, an unwatched pot will boil as if it absorbs heat as steadily while unobserved as it does while observed; but that was already one of the data of the problem. No mathematical investigation can determine that mathematical statements have truth-values even when beyond the reach of proofs or refutations; no psychologist can determine whether mental states occur independently of their manifestations. The realist thesis is not a possible object of discovery alongside the propositions it proposes to interpret: it is a doctrine concerning the status of those propositions.

It is difficult to avoid noticing that a common characteristic of realist doctrines is an insistence on the principle of bivalence—that every proposition, of the kind under dispute, is determinately either true or false. Because, for the realist, statements about physical reality do not owe their truth-value to our observing that they hold, nor mathematical statements their truth-value to our proving or disproving them, but in both cases the statements' truth-value is owed to a reality that exists independently of our knowledge of it, these statements are true or false according as they agree or not with that reality. Likewise in the other cases: for example, on a realist view of the past, the past event did or did not occur whether or not anyone remembers it or there is any record of it, and whether or not the evidence points in the right direction. What anti-realists were slow to grasp was that, conversely, they had in the most typical cases equally compelling grounds to *reject* bivalence and, with it, the law of excluded middle. The law of excluded middle says that, for every statement **A**, the statement $\lceil \mathbf{A}$ or not $\mathbf{A} \rceil$ is logically true. It therefore licenses various forms of argument that will not hold without it, in particular, that known as the dilemma (more exactly the simple constructive dilemma). You wish to prove some proposition **B**, say a mathematical one. You consider some proposition **A**—say the Riemann hypothesis—which no one has succeeded in proving, but which is probably true, and you contrive to prove **B** on the assumption **A**. If, now, you find out how to prove **B** on the contrary assumption \lceil Not $\mathbf{A} \rceil$, the law of excluded middle allows you to assert **B** outright. When the law of excluded middle is rejected as invalid, this form of argument can no longer be used.

Those who first clearly grasped that rejecting realism entailed rejecting classical logic were the intuitionists, constructivist mathematicians of the school of Brouwer. If a mathematical statement is true only if we are able to prove it, then there is no ground to assume every statement to be either true or false. The validity of the law of excluded middle does not depend absolutely on the principle of bivalence; but in this case, as in many, once we have lost any reason to assume every statement to be either true or false, we have no reason, either, to maintain the law of excluded middle. Being mathematicians, the intuitionists could not rest content with noting that their viewpoint on mathematics rendered certain classical modes of reasoning fallacious: they devised precise canons of valid inference, stricter than the classical ones. Thus was created intuitionistic logic, not the first, but by far the most interesting, non-classical system of logic. The only attempt that is in the least comparable has been the creation, originally instigated by Birkhoff and von Neumann, of quantum logic, which accepts the law of excluded middle but rejects the distributive law that allows

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us to infer \lceil Either both **A** and **B** or both **A** and **C** \rceil from \lceil **A** and either **B** or **C** \rceil ; but this is both less developed and far less widely accepted.

For precisely similar reasons, almost all varieties of anti-realism, when thought through, can be seen to entail a rejection of bivalence. No one taking an anti-realist view of the past could suppose every past-tense statement to be true or false, for there might exist no evidence either for its truth or for its falsity; likewise, the phenomenalist could not assume every statement about the physical world to be true or false, since no observational evidence might ever be forthcoming to decide it. In many cases, this ought to have resulted in as firm a repudiation of certain forms of classical argument as that of the intuitionist mathematicians; in practice, the topic was left almost wholly unexplored.

It may, however, provide us with a clue to the correct strategy of investigation. It looks at first glance as though, in these cases, we have a metaphysical doctrine yielding consequences for logic; the difficulty is in seeing how one could decide for or against the metaphysical premiss. We also face another and greater difficulty: to comprehend the content of the metaphysical doctrine. What does it mean to say that natural numbers are mental constructions, or that they are independently existing immutable and immaterial objects? What does it mean to ask whether or not past or future events are *there*? What does it mean to say, or deny, that material objects are logical constructions out of sense-data? In each case, we are presented with alternative *pictures*. The need to choose between these pictures seems very compelling; but the non-pictorial content of the pictures is unclear.

Were the positivists right to say that these are pseudo-questions, all answers to which are senseless? The doctrine was meant to be liberating; but it failed to exorcise the psychological allure exerted by the metaphysical pictures. Its failure is highlighted by the inability of the positivists to refrain from presenting pictures of their own. Phenomenalism is a metaphysical doctrine *par excellence*, being one version of a rejection of realism about the external world; and phenomenism was strongly supported by the positivists. Their ideal, to engage in philosophy while eschewing all philosophical doctrines, was approached more closely, in his later work, by Wittgenstein. Even he came out, however, as a decided opponent of realism concerning mental states and mathematics. True, he also rejected both behaviourism and formalism; but, if his variety of anti-realism was more subtle than those of his predecessors, he did not succeed in skirting the controversy over realism altogether.

If a decision for or against realism concerning one or another subject matter has practical consequences—namely, the replacement of

classical logic by some stricter canons of valid deductive reasoning—neither realism nor anti-realism can be devoid of content. It cannot be a matter of taste whether a form of argument is valid or not; the meanings of the premisses and the conclusion must determine whether or not the latter follows from the former. There may be alternative possible interpretations, on one of which the argument is valid and on the other of which it is not; but, the meanings once given, we are bound to be faithful to them in our reasoning. The meaning of a statement determines when we may rightly assert it. It therefore also determines whether our having rightly asserted the premisses of a putatively valid form of argument guarantees that we may rightly assert the conclusion. If it does, the argument is valid; if it does not, it is invalid. Hence a disagreement over the validity of certain forms of argument, such as that which marks, or ought to mark, the disagreement between the realist and the anti-realist concerning this or that subject matter, is necessarily also a disagreement about the kinds of meaning possessed by statements of some large range, such as statements about physical reality, mathematical statements, statements in the future tense, or statements of scientific theory.

Such disagreements about meaning must be deep. A superficial disagreement about meaning occurs when the meaning which one party to the dispute assigns to a certain expression is one that the other party accepts as being a perfectly coherent meaning which could be (or perhaps is) assigned to another expression: the dispute relates solely to whether that meaning is as a matter of fact attached to the given expression according to its standard use in the language. A deep disagreement occurs when the meaning assigned by one party is rejected by the other party as incoherent, that is, as not capable of being assigned to any expression whatever. This is often the effect of drawing a conceptual distinction. It is frequently alleged that rationalist philosophers like Spinoza failed to distinguish between a cause of an event and a ground for the truth of a proposition, and that empiricist philosophers like Locke failed to distinguish concepts from mental images. Once these distinctions have been pointed out, it becomes impossible to treat the word 'reason' as unambiguously meaning both 'cause' and 'ground', or the word 'idea' as unambiguously meaning both 'concept' and 'mental image'. A change in our theories may unquestionably have a similar result. Before special relativity, it was surely intrinsic to the meaning of the word 'before' that the question whether one event occurred before another had an answer which it made no sense to qualify as from a particular point of view (frame of reference); once we have accepted the theory, we cannot attach that meaning to the word or any other word. Disagreements over meaning

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between realists and anti-realists are necessarily of this character but far more wide-ranging. They concern the meaning, not of a specific expression, but of a whole sector of our vocabulary, or else, as in the case of realism about the future and the past, a fundamental linguistic operation such as tense inflection. The divergence is therefore not over how particular expressions are to be explained but over the correct general model for the meaning of a sentence of the kind under dispute. We may also describe it as a divergence about the appropriate notion of truth for statements made by means of such sentences. A constructivist holds, for example, that what renders a mathematical statement true is the existence of a proof; a platonist that it is a certain configuration of mathematical reality. The characterisations in terms of truth and of meaning are not rivals, however. As Frege was the first to recognise explicitly, the concepts of meaning and truth are intimately connected; so intimately that no fruitful philosophical explanation of either can be given that relies on the other's being already understood.

This now provides us with a line of attack upon these problems. Instead of tackling them from the top down, we must do so from the bottom up. An attack from the top down tries to resolve the metaphysical problem first, then to derive from the solution to it the correct model of meaning, and the appropriate notion of truth, for the sentences in dispute, and hence to deduce the logic we ought to accept as governing them. This approach, as we have seen, has twin disadvantages. First, we do not know how to resolve these disputes. The moves and counter-moves are already familiar, having been made repeatedly by philosophers on either side throughout the centuries. The arguments of one side evoke a response in certain of the spectators of the contest, those of the other side sway others of them; but we have no criterion to decide the victors. No knock-out blow has been delivered. The decision must be given on points; and we do not know how to award points. Secondly, even to attempt to evaluate the direct metaphysical arguments, we have to treat the opposing theses as though their content were quite clear and it were solely a matter of deciding which is true; whereas, as we saw, the principal difficulty is that, while one or another of the competing pictures may appear compelling, we have no way to explain in non-pictorial terms what accepting it amounts to.

To approach these problems from the bottom up is to *start* with the disagreement between the realist and the various brands of anti-realist over the correct model of meaning for statements of the disputed class, ignoring the metaphysical problems at the outset. We are dealing, after all, with forms of statement which we actually employ and which, with the exception of the statements of mathematics and scientific

theory, are familiar to all human beings. Their meanings are already known to us. No hidden power confers these meanings on them: they mean what they mean in virtue of the way we use them, and of nothing else. Although we know what they mean and have come, in the course of our childhood and our education, to learn what they mean, we do not know how to represent their meanings: that is, we learn to use them but do not know precisely what it is that we learn when we learn that. We do not, in Wittgenstein's phrase, command a clear view of the working of our language. We are able to operate with it in contexts in which we normally find ourselves; but we are like soldiers in a battle, grasping enough to be able to play our assigned parts but completely in the dark about what is happening on any larger scale. Mathematicians certainly understand mathematical statements sufficiently to operate with them, to make conjectures and try to establish or refute them, to follow and devise proofs, often with great insight; but, asked to explain the significance of their enterprise as a whole, to say whether mathematics is a sector in the quest for truth, and, if so, what the truths they establish are about, they usually flounder. Physicists, likewise, know how to use quantum mechanics and, impressed with its success, feel confident that it is true; but their endless discussions on the interpretation of quantum mechanics show that, while they believe it to be true, they do not know what it means.

Perhaps, then, this is true of all of us. Perhaps the flat assertion that we know what our words mean needs qualification: we know what they mean sufficiently well to use them correctly in familiar contexts, but we do not fully understand them. It remains the case that they mean what they do only because of the use to which we put them. To gain a complete understanding, to come to command a clear view of how they function, we need to scrutinise our own linguistic practices with close attention, in order, in the first instance, to become conscious of exactly what they are, but with the eventual aim of attaining a systematic description of them. Such a description will give a representation of what it is for the words and expressions of our language to have the meanings that they do. It must embrace everything that we learn when we first learn language, and hence cannot take as already given any notions a grasp of which is possible only for a language-speaker. In this way, it will lay bare what makes something a *language*, and thus what it is for a word or sentence to have a meaning.

Such a description of how language functions, that is, of all that a child learns during the process of acquiring a language, will constitute a meaning-theory. The task of constructing a meaning-theory can, in principle, be approached without metaphysical presuppositions or *arrière-pensées*: success is to be estimated according as the theory does

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or does not provide a workable account of a practice that agrees with that which we in fact observe. It thus provides us with a means of resolving the metaphysical disputes about realism; not an indirect means, but one which accords with their true nature, namely as disputes about the kind of meaning to be attached to various types of sentences. The logical laws that ought to be accepted as governing any given fragment of the language depend upon the meanings of the sentences in that fragment, in particular, upon the meanings of the logical constants as used in those sentences. They can therefore be determined from a correct model of the meanings which those sentences have. Specifically, any account of the meanings of the logical constants has to supply a general characterisation of the contribution which a sentence makes to the content of a more complex sentence formed from it. This forces the meaning-theory to frame, for sentences of the language in general, or for subclasses of sentences within it, what has here been called a general model of meaning. In this way the theory will determine the correct logic, either for the language as a whole or, if it is too diverse for there to be such a thing, for each of the various sublanguages that together make it up. It will therefore settle the disagreement between the realist and anti-realist sides in each of the various metaphysical controversies over which logical laws ought to be treated as holding good.

Will it also settle the metaphysical controversies themselves? It is my contention that it will. In the process of constructing a general model of the meaning of a sentence belonging to each sector of the language, the theory will elucidate the concept of truth, as applied to statements belonging to that sector—statements about physical reality, mathematical statements, statements in the past tense, or the like—by setting that concept in its proper place in the characterisation of the meanings of those sentences. It will thus adjudicate between the rival conceptions of truth advocated by realists and anti-realists. For example, it will decide whether, as the realist believes, our understanding of mathematical statements demands to be explained in terms of a grasp of what would render them true, independently of our knowledge of their truth-value, and, if so, in what our grasp of this consists; or whether, as the constructivist supposes, it can be sufficiently explained in terms of our ability to recognise proofs or disproofs of such statements when presented with them. In the latter case, the appropriate notion of truth for mathematical statements is to be explained in terms of their provability. It will therefore resolve the controversy over whether a realist interpretation is tenable or has to be rejected.

It will resolve these controversies without residue: there will be no further, properly metaphysical, question to be determined. The meta-

physical character of the controversies derives from their naturally presenting themselves as concerned with deep general questions about the constitution of reality and what it comprises. It is not wrong to say that they do concern such deep general features of reality. The mistake lies in supposing that to resolve these questions we have to study reality, not by the observational and experimental techniques of the scientist, but by applying the reflective insight of the metaphysician. Whichever of the rival metaphysical doctrines we adopt informs our conception of reality by endorsing a particular way of understanding our thought about reality: what the controversy directly concerns is precisely how we ought to understand it. It is therefore to be resolved, if not within logic properly so called, then within that part of philosophy of which logic is a specialised branch: the philosophy of thought, which, when approached via language, becomes the theory of meaning. Once resolved in favour of a particular doctrine, the picture of reality that goes with the doctrine and that gives it its metaphysical expression will automatically force itself upon us; but it has no additional content of its own. Its non-metaphysical content consists in the model of meaning which it suggests; however powerfully the picture impresses itself on us, we have to bear in mind that its content is a thesis in the theory of meaning, and that, beyond that, it is no more than a picture.

The thesis which gave a content to the picture could not be evaluated without constructing an overall theory of meaning; without that, the thesis is merely a proposal for how that part of such a theory ought to go, and we can have at best a hunch that such a proposal is correct. To construct a meaning-theory in the sense explained is obviously a complex task that requires us to make explicit much that we are ordinarily content to leave implicit. It nevertheless provides us with a programme, whose execution will lead, if what I have argued is sound, to a resolution of problems of deep import before which philosophy has for long—in some of the cases, for centuries—been stalled.

I am not aspiring in this book to arrive at a solution to a single one of these metaphysical problems: I am aiming at no more than a prolegomenon to an attempt to tackle them in accordance with the bottom-upwards strategy I have been advocating. The adoption of this strategy does not mean ignoring the traditional arguments for and against realism in the various controversies; it means transposing them from a metaphysical to a meaning-theoretical key. In the process, the different controversies must be laid side by side and treated comparatively. There is little likelihood of a uniform solution to all of them. Realism concerning one subject matter may create a favourable disposition towards realism concerning another but cannot possibly entail

it: each case must be judged on its merits. But a comparative treatment can help us to decide what those merits are. Although there is no perfect structural analogy between any two of the controversies, the structural similarities are sufficiently strong that we may hope to develop general criteria for what, in any one instance, a realist needs to establish in order to prove his case. The arguments of the anti-realist often turn on particular features of the subject matter, and there is then no presumption that opting for an anti-realist view in one instance will demand the adoption of such a view in others. It is, however, possible to distil from the arguments that have been used by anti-realists concerning diverse subject matters a general argument against realism in any controversial case, that is, as applicable to any but the most restricted sectors of our language. This argument, if correct, would indeed lead to a kind of global anti-realism; whether such a view would be coherent would have to be tested by applying it to each of the ranges of statement that have generated controversy about the tenability of a realist interpretation. In order to distil such a general argument, a presentation in meaning-theoretical terms is essential: global anti-realism is impossible to frame in any other mode.

To get as far as this in an investigation of these problems, we need a firm base. The base will consist of a set of general principles governing the formulation of a meaning-theory. I have spoken of constructing a meaning-theory as if it were a task we knew how to set about; but of course it is not. The conception of such a theory originates with Frege's theories of sense and reference, or, more exactly, his theory of reference understood in the light of his account of the relation of sense to reference. We are, however, still far from any consensus about the general shape a meaning-theory should take; if we were not, the metaphysical problems I have listed would look much closer to a solution. Just as we do not know how to go about solving those problems, so we do not know how to decide on the correct shape for a meaning-theory; to reach such a decision, we must attain a clear conception of what a meaning-theory can be expected to do. Such a conception will form a base camp for an assault on the metaphysical peaks: I have no greater ambition in this book than to set up a base camp.

In setting it up, we must prejudge no issues. The metaphysical issues we hope eventually to resolve entail a choice concerning the forms of deductive argument that are to be accepted as valid, a choice between classical logic and one or another non-classical logic—intuitionistic logic, quantum logic, or some other logic yet to be devised. A sharp distinction must be made between criticism of a proposed formalisation of the way we are accustomed to reason and a criticism of the way we are accustomed to reason. The controversy, within the traditional

Aristotelian logic, over existential import was of the former kind. The question was whether or not, in enunciating the logical laws, it was best to treat the schematic form 'Every **S** is **P**' as implying the existence of at least one object to which the subject-term **S** applied. If one did, certain syllogistic inferences—for instance, Fesapo (EAO in the third figure)—were valid; if one did not, they were not. But no one suggested that anybody had in practice reasoned incorrectly, had, for example, drawn a conclusion of the form 'Some **S** is not **P**' from premisses 'No **M** is **P**' and 'Every **M** is **S**', established only on the basis of the weaker interpretation not involving existential import. By contrast, the intuitionist challenge to the law of excluded middle did concern the right way to reason in mathematics, not merely the right way to formalise our reasoning practice. The intuitionists held, and continue to hold, that certain methods of reasoning actually employed by classical mathematicians in proving theorems are invalid: the premisses do not justify the conclusion. The immediate effect of a challenge to fundamental accustomed modes of reasoning is perplexity: on what basis can we argue the matter, if we are not in agreement about what constitutes a valid argument? In any case, how can such a basic principle of rational thought be rationally put in doubt?

The affront to which the challenge gives rise is quickly allayed by a resolve to take no notice. The challenger *must* mean something different by the logical constants; so he is not really challenging the laws that we have always accepted and may therefore continue to accept. This attempt to brush the challenge aside works no better when the issue concerns logic than in any other case. Perhaps a polytheist cannot mean the same by 'God' as a monotheist; but there is disagreement between them, all the same. Each denies that the other has hold of a coherent meaning; and that is just the charge made by the intuitionist against the classical mathematician. He acknowledges that he attaches meanings to mathematical terms different from those the classical mathematician ascribes to them; but he maintains that the classical meanings are incoherent and arise out of a misconception on the part of the classical mathematician about how mathematical language functions. Thus the answer to the question how it is possible to call a basic logical law in doubt is that, underlying the disagreement about logic, there is a yet more fundamental disagreement about the correct model of meaning, that is, about what we should regard as constituting an understanding of a statement. The answer to the question how the validity of such a law can be rationally discussed is that we have to find some neutral manner of formulating the rival conceptions of meaning so as to be able to argue their merits without prejudging the issue in favour of one or the other.

The logical basis for investigation of the metaphysical disputes, which is what I aim to construct in this book, must therefore allow for all possibilities. It must not assume the correctness of any one logical system but must describe how the choice between different logics arises at the level of the theory of meaning and depends upon the choice of one or another general form of meaning-theory. In trying to construct such a base, we are forced to dig very deep, as solid foundations must necessarily be laid. We must dig below what we normally take for granted, without making explicit, our assumptions, namely, about what our words mean and, above all, about what the logical constants mean.

In the process, we cannot afford to neglect the resources that are at hand. The revolution effected by Frege led to an explosive development of logic; advances in the theory of meaning have proceeded at a far slower pace. Logicians have precisely formulated a variety of non-classical logics; they have explored different ways of formalising classical and non-classical logics; they have employed algebraic methods to characterise those logics, and, by both proof-theoretic and algebraic means, established their general properties; they have converted some of these algebraic characterisations into semantic theories that purport to state the meanings of the logical constants and thereby to provide a standard by which we may judge whether a formalisation is sound, in the sense that all inferences it permits are genuinely valid, or whether it is complete, in the sense that it permits all genuinely valid inferences. What logical theory cannot pretend to do is to adjudicate between these rival logical systems: it can treat them only as objects of investigation. A semantic theory is not a complete meaning-theory but only a preliminary outline sketch of one; and it cannot be judged correct or incorrect until it has been expanded into a meaning-theory which displays the connection between the meanings of the sentences, as represented by the theory, and the practice of using the language. It is obvious, however, that no serious enquiry into these questions is possible if it fails to avail itself of the technical resources that mathematical logic places at its disposal.

This book has been written in the hope of contributing to what I see as the most pressing task of contemporary analytical philosophy, the construction of a satisfactory theory of meaning. On the basis of such a theory, we shall have a clearer grasp of what is required of any piece of conceptual analysis, and hence of how to handle philosophical problems in general; in particular, we shall be well placed to make a direct attack on the metaphysical problems concerning realism which I have been recalling. But, because the contribution it seeks to make is only the construction of a basis, and because, in doing so, I have in places

invoked technical concepts of formal logic, it risks arousing the disgust that the layman too readily allows himself to feel towards analytical philosophy. The layman wants the philosopher to give him a reason for believing, or for disbelieving, in God, in free will, or in immortality. In this introduction I have not raised those questions, but I have raised others almost equally profound: yet I am not proposing to answer them. I propose only to try to provide a base from which we might set out to seek for the answers. Worse, I employ, at various stages of the process, technical notions not part of the layman's repertoire.

I make no apology. Philosophical writing of the past, and of the present day as well, supplies answers to the great questions of metaphysics; and the answers usually satisfy no one but their authors. It is because these questions are of an exceptional difficulty that the labours of clever men, over many centuries, have failed to produce answers generally acknowledged as correct. Certainly their combined efforts have brought us somewhat nearer to finding the answers; not, however, as yet any nearer to being able to tell what those answers will be when we find them. This painfully slow pace of advance is also due, I believe, to an underestimation by even the deepest thinkers of the difficulty of the questions they tackle. They consequently take perilous shortcuts in their argumentation and flatter themselves that they have arrived at definitive solutions when much in their reasoning is questionable. I believe that we shall make faster progress only if we go at our task more slowly and methodically, like mountain climbers making sure each foothold is secure before venturing onto the next. Philosophy is, after all, a craft, as plumbing is. Many years ago a plumber who had come to our house to make some urgent repair which my wife had vainly attempted herself said to me, 'You don't want to go at it bald-headed, like your good lady here'. Philosophy would interest me much less if I did not think it possible for us eventually to attain generally agreed answers to the great metaphysical questions; but I should not have written this book unless I also thought that we should do better not to go at them bald-headed.