

The Logical Basis of Metaphysics

Michael Dummett

Harvard University Press Cambridge, Massachusetts 1991

Copyright © 1991 by Michael Dummett

All rights reserved

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

This book is printed on acid-free paper, and its binding materials have been chosen for strength and durability.

Library of Congress Cataloging-in-Publication Data

Dummett, Michael A. E.

The logical basis of metaphysics / Michael Dummett.

p. cm. — (The William James lectures : 1976)

Includes index.

ISBN 0-674-53785-8

1. Metaphysics. 2. Logic. I. Title. II. Series.

BC51.D85 1991

90-39999

121'.68—dc20

CIP

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.

Michael Dummett
Stanford, California, 1989

Contents

Preface ix

Introduction: Metaphysical Disputes over Realism 1

1 Semantic Values 20

2 Inference and Truth 40

3 Theories of Truth 61

4 Meaning, Knowledge, and Understanding 83

5 Ingredients of Meaning 107

6 Truth and Meaning-Theories 141

7 The Origin and Role of the Concept of Truth 165

8 The Justification of Deduction 184

9 Circularity, Consistency, and Harmony 200

10 Holism 221

11 Proof-Theoretic Justifications of Logical Laws 245

12 The Fundamental Assumption 265

13 Stability 280

14 Truth-Conditional Meaning-Theories 301

15 Realism and the Theory of Meaning 322

Index 353

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

2 *The Logical Basis of Metaphysics*

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

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

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

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 '**A** or not **A**' 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 '**Not A**', 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

us to infer 'Either both **A** and **B** or both **A** and **C**' from '**A** and either **B** or **C**'; 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